GW - 15

MONITORING REPORTS

DATE:

2007-1994

Chavez, Carl J, EMNRD

From: Dick, Daniel I [DIDick@dcpmidstream.com]
Sent: Tuesday, January 30, 2007 1:21 PM
To: Chavez, Carl J, EMNRD
Cc: Ward, Lynn C
Subject: Linam Ranch Gas Plant - Q3 2006 Groundwater Monitoring Report

Mr. Chavez –

Please find attached the above referenced report and cover letter. Copies have been sent via mail to Larry Johnson with the OCD District 1 office as well.

Sincerely,

Daniel Dick
DCP Midstream
Environmental Assurance
370, 17th Street, Suite 2500
Denver, CO 80120
Ph: 303-605-1893
Fx: 303-605-1957

370 17th Street, Suite 2500
Denver, Colorado 80202
303-605-1893 – main
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January 30, 2007

Mr. Carl Chavez, CHMM
New Mexico Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

RE: Third Quarter 2006 Groundwater Monitoring Report for the Linam Ranch Gas Plant, Lea County, New Mexico Unit B, Section 6, Township 19 South, Range 37 East

Dear Mr. Chavez:

DCP Midstream, LP (DCP) is pleased to submit for your review one electronic (PDF) copy of the Third Quarter 2006 Groundwater Monitoring Report for the Linam Ranch Gas Plant located in Lea County, New Mexico (Unit B Section 6, Township 19 South, Range 37 East).

The data indicate that the groundwater conditions remain stable. The next monitoring event is scheduled for the first quarter 2007. The next annual report for the site will be prepared following the completion of the first quarter 2007 monitoring activities and review and validation of the analytical results.

If you have any questions regarding this report, please call me at 303-605-1893.

Sincerely
Duke Energy Field Services, LP

Daniel Dick
Environmental Assurance

Enclosure

cc: Larry Johnson – OCD District Office Hobbs
Lynn Ward – DEFS Midland
Environmental Files

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

January 30, 2007

Mr. Daniel Dick
DCP Midstream, LP
370 Seventeenth Street, Suite 2500
Denver, Colorado 80202

Subject: Summary of Third Quarter 2006 Groundwater Monitoring Event at the Linam Ranch Gas Plant, Lea County, New Mexico
Unit B, Section 6, Township 19 South, Range 37 East

Dear Daniel:

This letter summarizes the activities completed and data generated during the third quarter 2006 groundwater-sampling event at the DCP Midstream, LP (DCP, formerly known as Duke Energy Field Services) Linam Ranch Gas Plant in Lea County New Mexico. The facility is located in New Mexico Oil Conservation Division (OCD) designated Unit B, Section 6, Township 19 South, Range 37 East (Figure 1). The coordinates are 32.6965 degrees north, 103.2883 degrees west. The facility is an active gas-processing plant.

The 14 monitoring well locations are shown on Figure 2. Construction information is included in Table 1.

The event included the measurement of fluid levels in all monitoring wells and the sampling of all wells that did not contain measurable free phase hydrocarbons (FPH). Trident Environmental of Midland Texas completed the sampling on September 21 and 22, 2006.

The fluid measurements, FPH thicknesses and corrected groundwater elevations are summarized in Table 2. The water-table elevations for the wells containing FPH were estimated using the following formula:

$GWE_{corr} = MGWE + (FPHT*PD)$: where

- MGWE is the actual measured groundwater elevation;
- FPHT is the measured free-phase hydrocarbon thickness; and
- PD is the free phase hydrocarbon density (assumed 0.81 based upon historic data).

The historic water-table elevation data are summarized in Table 3. Hydrographs for select wells throughout the study area are included on Figure 3. The water table rose substantially in MW-2 following heavy precipitation in late summer 2006. MW-2 is located in a natural drainage swale that is blocked by a man-made berm.

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A water-table contour map for the September 2006 data was generated using the program Surfer with its kriging option (Figure 4). Note that well MW-7 was not included in this map. The water-table elevation in MW-7 is lower than those measured in the wells in the central area (MW-1, MW-4, MW-5 and MW-6). Including this well results in a water-table configuration that suggests radial flow from the center of the property. Well MW-7 has never contained measurable benzene, toluene, ethylbenzene or xylenes. This lack of impacts suggests that the relatively higher water table measured in the central part of the site is localized so the contours should not be carried to the northwest.

The water-table contours shown on Figure 4 are similar to the historic flow pattern. Groundwater flow is toward the southeastern corner of the property where well MW-3 is located. The gradient also decreased appreciably down gradient from wells MW-2 and MW-8. This change is probably related to the mounding associated with the historic drainage through the center of the facility.

The FPH thickness measurements for September 2006 are included in Table 2. Well MW-4 does not appear to contain a sufficient thickness of FPH to permit active FPH recovery using a product-only system. The thickness measured in MW-6 may warrant restarting FPH collection.

The analytical results are summarized in Table 4, and the laboratory report is attached. The quality control data can be summarized as follows:

- There were no BTEX detections in the September 2006 trip blank.
- The duplicate values for September 2006 were all under five percent relative percentage difference (RPD) for benzene, ethylbenzene and xylenes. The toluene RPD value differed by only 7.2 percent.
- All but one of the 26 surrogate spikes from both episodes were within range.
- The laboratory the matrix spike and matrix spike duplicate analysis were within their respective control limits.

The above facts establish that the data is suitable for all intended uses.

The constituents that exceed the potentially applicable New Mexico Water Quality Control Commission groundwater standards are highlighted in Table 4. Wells MW-5, MW-10 and MW-10D contained constituents that exceeded these standards.

Benzene isopleths generated by the Surfer program using the kriging option are plotted on Figure 5 for the September 2006 data. Figure 5 establishes the following facts:

- Any of the dissolved-phase BTEX constituents that emanate from the FPH in MW-4 and MW-6 attenuate to concentrations that are at or below the method reporting limits before migrating to the vicinity of MW-1 (cross gradient) or MW-8 (down gradient).

- The elevated dissolved-phase BTEX constituents that are measured at MW-10 and MW-10D attenuate to concentrations that are below the method reporting limits at the interior down gradient wells MW-9 and MW-13.

- The patterns described in the above two bullets have remained constant since the middle of 2001. This consistency indicates that the BTEX distribution and the attenuating mechanisms that control it are equilibrated.

The historical data for all wells is summarized in Table 5 for benzene, Table 6 for toluene, Table 7 for ethylbenzene and Table 8 for total xylenes. Graphs of benzene concentrations verses time are included for MW-10 in Figure 6 and for MW-9, MW-10D and MW-11 in Figure 7. Examination of these figures indicates that benzene concentrations in the historic source areas have declined after a March 2005 rebound. Benzene was not detected in MW-9 and MW-11 above the 0.001 method reporting limit (Table 5)

A benzene-time graph for MW-5, located upgradient from MW-4 and MW-6, is included as Figure 8. The benzene concentrations in MW-5 exhibit an overall increasing trend. Concentrations in this well could be indicative of new sources or changed hydrogeologic conditions so they will be evaluated at each event for long-term trends.

The above data establishes that dissolved-phase releases from the FPH in this area are attenuated to below the method reporting (and detection) limits approximately 1,000 feet from the nearest down-gradient property boundary.

DCP has indicated that the wells containing the FPH are in an active gas processing area so the safety risks inherent to restarting FPH collection more than offset the environmental benefits that would be associated with the activity. DCP personnel have a specific concern with MW-4 because of its immediate proximity to the plant's flare. The primary concern is that the noise in the area would interfere with notification of the sampling crew if a process upset greatly increased the discharge volumes from the flare. AEC recommends that MW-4 be plugged and abandoned because of that safety concern.

The next semi-annual groundwater-monitoring episode is scheduled for the first quarter of 2007. Do not hesitate to contact me if you have any questions or comments on this report or any other aspects of the projects.

Sincerely,
AMERICAN ENVIRONMENTAL CONSULTING, LLC

Michael H. Stewart

Michael H. Stewart, PE
Principal Engineer

MHS/tbm

attachment

TABLES

Table 1 – Linam Ranch Gas Plant Well Construction Summary

Well	Well Elevation (Top of Casing)	Well Depth (TOC)	Well Diameter
	(feet)	(feet)	(inches)
MW-1	3718.29	54.20	2
MW-2	3714.80	50.50	2
MW-3	3715.50	55.30	2
MW-4	3720.46	54.13	4
MW-5	3721.53	55.20	4
MW-6	3720.99	54.10	4
MW-7	3728.57	62.50	2
MW-8	3714.18	58.30	4
MW-9	3720.48	59.10	2
MW-10	3720.76	65.00	4
MW-10D	3720.85	79.00	2
MW-11	3722.02	62.80	4
MW-12	3720.60	58.30	4
MW-13	3721.63	63.00	4

Table 2 –Linam Ranch Gas Plant September 21, 2006 Fluid Gauging Data

Well	Depth to Water	Depth to Product	Free Phase Hydrocarbon Thickness	Corrected Water Table Elevation
MW-1	37.93			3682.25
MW-2	35.56			3681.68
MW-3	45.7			3672.00
MW-4	41.51	40.8	0.71	3680.94
MW-5	43.37			3680.23
MW-6	45.71	42.11	3.60	3677.37
MW-7	56.89			3673.95
MW-8	39.09			3677.09
MW-9	49.07			3673.41
MW-10	48.77			3674.13
MW-10D	49.79			3673.75
MW-11	49.23			3675.30
MW-12	48.32			3674.52
MW-13	50.49			3673.50

Notes: All units in feet
NP: Free Phase Hydrocarbon not present

Table 3 - Linam Ranch Gas Plant Summary of Historic Groundwater Elevation Data

Well	12/1/92	5/22/94	5/17/95	11/14/95	1/17/96	4/24/96	1/22/97	8/15/97	1/22/98	7/20/98	2/9/99	8/24/99	2/21/00	8/17/00	2/6/01
MW-1		3676.28	3674.68		3676.23	3675.37	3674.45	3674.63	3674.19	3673.67	3673.76	3675.21	3675.41	3676.71	3676.99
MW-2		3682.29	3673.49				3673.19		3672.80	3672.37	3672.41	3674.43	3672.68	3679.43	3674.05
MW-3		3671.47	3670.72	3671.30		3671.13	3670.47		3669.96	3669.80	3669.59	3669.68	3669.51	3669.68	3669.48
MW-4	3677.10	3676.96	3675.43	3675.75	3676.27	3675.50	3674.29	3674.12	3674.52	3673.76	3674.45	3675.44	3675.81	3676.07	3675.39
MW-5	3677.65	3677.33	3675.43	3676.62	3676.23	3675.51	3674.35	3673.96	3674.74	3674.21	3674.84	3675.47	3675.84	3675.66	3675.24
MW-6	3676.87	3676.70	3674.87	3676.80	3676.18	3676.37	3674.21	3673.91	3674.21	3673.59	3673.84	3674.86	3675.11	3675.61	3674.75
MW-8		3674.83	3672.73		3674.47	3673.36	3672.78	3672.04	3671.87	3671.61	3671.48	3672.56	3671.93	3674.66	3672.60
MW-9		3672.89	3671.88	3672.46	3672.64	3672.40	3671.52	3671.14	3671.00	3670.90	3670.67	3670.89	3670.78	3670.92	3670.86
MW-10			3672.45	3673.05	3673.08	3672.75	3671.78	3671.41	3671.33	3671.22	3671.02	3671.39	3671.24	3671.53	3671.36
MW-10D			3672.16	3672.91	3672.81	3672.36	3671.43	3671.07	3671.13	3670.99	3670.78	3671.03	3670.98	3671.29	3670.97
MW-11			3673.03	3674.19	3673.88	3673.31	3672.21	3671.81	3672.01	3671.88	3671.68	3672.06	3672.09	3672.47	3672.22
MW-12			3672.37	3673.32	3673.25	3672.75	3671.74	3671.40	3671.34	3671.18	3671.00	3671.59	3671.33	3671.86	3671.50
MW-13			3672.02	3672.57	3672.66	3672.34	3671.43	3671.05	3670.93	3670.80	3670.60	3670.94	3670.74	3671.04	3670.88

Well	8/2/01	3/11/02	9/25/02	3/8/03	9/17/03	3/16/04	8/17/04	3/15/05	9/29/05	3/22/06	9/21/06
MW-1	3674.81	3674.04	3674.43	3674.32	3673.80	3674.30	3676.59	3682.86	3684.83	3684.08	3682.25
MW-2	3672.69	3672.07	3672.26	3672.21	3671.69	3671.26	3679.10	3679.39	3678.22	3676.04	3681.68
MW-3	3669.31	3669.14	3669.03	3669.06	3668.87	3668.63	3669.00	3671.37	3671.52	3671.63	3672.00
MW-4	3674.80	3674.59	3675.13	3674.60	3674.16	3674.04	3675.77	3681.85	3682.38	3682.04	3680.94
MW-5	3674.82	3675.07	3674.99	3674.81	3674.32	3674.32	3674.32	3680.24	3680.65	3680.66	3680.23
MW-6	3674.15	3674.30	3674.61	3674.12	3673.55	3673.07	3674.68	3680.13	3677.46	3677.42	3677.37
MW-8	3671.26	3671.51	3671.59	3671.59	3670.71	3670.67	3673.30	3676.74	3677.01	3675.71	3677.09
MW-9	3670.62	3670.61	3670.61	3670.68	3670.48	3670.15	3670.28	3673.36	3673.66	3674.00	3673.41
MW-10	3671.06	3671.10	3671.13	3671.17	3670.87	3670.52	3670.84	3674.42	3674.35	3674.69	3674.13
MW-10D	3670.76	3670.84	3670.81	3670.85	3670.46	3670.28	3670.51	3673.72	3674.03	3674.05	3673.75
MW-11	3671.79	3672.02	3672.05	3672.00	3671.49	3671.02	3671.67	3675.45	3675.54	3675.68	3675.30
MW-12	3671.07	3671.01	3671.09	3671.15	3670.81	3670.36	3671.10	3674.97	3674.46	3674.64	3674.52
MW-13	3670.58	3670.50	3670.50	3670.57	3670.32	3669.95	3670.31	3673.69	3673.61	3673.56	3673.50

Table 4 –Linam Ranch Gas Plant September 21, 2006 Sampling Results

Well	Benzene	Toluene	Ethylbenzene	Xylenes
NMWQCC	0.01	0.75	0.75	0.62
MW-1	0.0011	<0.001	<0.001	0.0017
MW-2	<0.001	<0.001	<0.001	<0.001
MW-3	<0.001	<0.001	<0.001	<0.001
MW-5	**1.06**	0.0069	0.407	0.178
MW-7	<0.001	<0.001	<0.001	0.0015
MW-8	<0.001	<0.001	<0.001	<0.001
MW-9	0.001	<0.001	<0.001	<0.001
MW-10	**1.19**	0.2	0.205	0.246
MW-10 DUP	**1.18**	0.193	0.202	0.229
MW-10D	**0.0537**	0.0378	0.0075	0.0205
MW-11	<0.001	<0.001	<0.001	<0.001
MW-12	<0.001	<0.001	<0.001	<0.001
MW-13	<0.001	<0.001	<0.001	<0.001

NMWQCC: New Mexico Water Quality Control Commission groundwater standards.
Bolded cells exceed the potentially-applicable NMWQCC standard
All units mg/l

Table 5 - Linam Ranch Gas Plant Summary of Historical Results for Benzene

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	0.0053	<0.001	<0.001											
11/3/1992	0.0015			16.0	0.003	0.34								
12/2/1992	0.0013			17.0	0.009	0.52								
1/12/1994	0.0039			18.0	0.300	0.77		<0.001						
5/17/1995	<0.002	<0.001	<0.001	20.9	0.090	0.98	<0.001	<0.001	<0.001	3.225	0.096	<0.001	<0.001	<0.001
11/14/1995									<0.001	5.23	0.125	0.306	<0.001	0.003
1/17/1996									0.001	6.11	0.841	0.549	<0.001	<0.001
4/24/1996									<0.001	6.94	8.14	0.52	<0.001	<0.001
1/22/1997									<0.001	6.41	0.365	0.267	<0.001	0.048
8/15/1997									<0.001	5.63	0.221	0.164	0.001	0.132
1/22/1998									<0.001	7.03	<0.001	0.291	<0.001	0.082
7/20/1998									<0.001	7.18	0.184	0.061	0.002	0.061
2/9/1999			<0.001						0.011	4.87	0.009	0.018	0.001	0.082
8/25/1999	<0.005	<0.005	<0.001		0.137		<0.005	<0.001	<0.005	5.58	0.036	0.005	0.003	0.062
2/22/2000	<0.005	<0.005	<0.001		0.068		<0.005	<0.005	0.014	2.35	0.014	0.02	<0.001	0.08
8/18/2000	<0.001	<0.001	<0.005		<0.005		<0.005	0.002	0.036	3.11	<0.005	0.009	<0.005	0.04
2/7/2001	<0.005	<0.005	<0.005		<0.005		<0.005	<0.005	<0.005	1.23	<0.005	0.013	<0.001	0.023
8/2/2001	0.003	0.007	0.002		<0.005		<0.005	<0.001	0.038	1.64	<0.001	0.002	<0.001	0.002
3/11/2002	<0.001	<0.001	<0.001	17.9	0.062		<0.001	<0.001	0.048	3.26	0.002	0.005	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	18.8	0.381	1.29	<0.005	<0.001	0.071	3.48	<0.001	0.002	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	16.9	0.079	0.16	<0.005	<0.001	0.077	4.21	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	15.8	0.116		<0.001	<0.005	<0.005	1.34	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	17.8	0.146		<0.001	<0.001	<0.001	0.456	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	16.6	0.012		<0.001	<0.001	<0.001	1.3	0.011	0.003	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		0.262		<0.001	<0.001	0.0061	3.91	0.107	0.0264	<0.001	<0.001
9/29/2005	0.0067	<0.001	<0.001		0.63		<0.001	<0.001	0.0029	1.67	0.0703	<0.001	<0.001	<0.001
3/22/2006	0.0028	<0.001	<0.001		0.569		<0.001	<0.001	0.0023	1.48	0.224	<0.001	<0.005	<0.001
9/21/2006	0.0011	<0.001	<0.001		1.06		<0.001	<0.001	0.001	1.19	0.0537	<0.001	<0.001	<0.001

All units mg/l and duplicate values are averaged
Blank cells note samples for wells that were either not install or not sampled

Table 6 - Linam Ranch Gas Plant Summary of Historical Results for Toluene

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	0.0067	<0.001	0.0021											
11/3/1992	0.0015			8.0	0.0034	0.023								
12/2/1992	0.0014			8.2	0.0041	0.020								
1/12/1994	<0.001			10.0	0.190	0.0029		<0.005						
5/17/1995	<0.002	<0.001	<0.001	1.35	0.014	0.007	<0.001	<0.001	<0.001	0.052	0.004	<0.001	<0.001	<0.001
11/14/1995									<0.001	0.001	0.001	<0.001	<0.001	<0.001
1/17/1996									<0.001	0.863	0.001	0.004	<0.001	<0.001
4/24/1996									<0.001	<0.010	0.046	<0.002	<0.001	<0.001
1/22/1997									<0.001	1.63	<0.005	<0.001	<0.001	<0.001
8/15/1997									<0.001	1.35	<0.01	<0.001	<0.001	<0.001
1/22/1998									<0.001	1.93	<0.001	0.004	<0.001	<0.001
7/20/1998									<0.001	2.34	0.014	<0.001	<0.001	<0.001
2/9/1999			<0.001						<0.001	0.32	<0.005	<0.001	<0.001	<0.001
8/25/1999	<0.005	<0.005	<0.001		0.037		<0.005	<0.001	<0.005	0.658	<0.001	<0.001	<0.001	<0.001
2/22/2000	<0.005	<0.005	<0.001		<0.005		<0.005	<0.005	<0.005	0.129	<0.005	<0.001	<0.001	<0.001
8/18/2000	<0.001	<0.001	<0.005		<0.005		<0.005	<0.001	<0.005	0.025	<0.005	<0.005	<0.005	<0.005
2/7/2001	<0.005	<0.005	<0.005		<0.005		<0.005	<0.005	<0.005	0.082	<0.005	<0.001	<0.001	<0.005
8/2/2001	<0.001	<0.001	<0.001		<0.005		<0.005	<0.001	<0.001	<0.02	<0.001	<0.001	<0.001	<0.001
3/11/2002	<0.001	<0.001	<0.001	<0.100	<0.001		<0.001	<0.001	<0.001	0.178	<0.001	<0.001	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	<0.100	<0.050	<0.050	<0.005	<0.001	<0.001	<0.100	<0.001	<0.001	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	<0.100	<0.050	<0.100	<0.005	<0.001	<0.001	<0.100	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	<0.200	<0.001		<0.001	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	<0.200	<0.001		<0.001	<0.001	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	<0.100	<0.005		<0.001	<0.001	<0.001	<0.020	<0.001	<0.001	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		<0.005		<0.001	<0.001	<0.001	0.303	0.0444	<0.005	<0.001	<0.001
9/29/2005	<0.001	<0.001	<0.001		<0.0100		<0.001	<0.001	<0.001	0.39	0.0453	<0.001	<0.001	<0.001
3/22/2006	<0.001	<0.001	<0.001		<0.0100		<0.001	<0.001	<0.001	0.254	0.0614	<0.001	<0.005	<0.001
9/21/2006	<0.001	<0.001	<0.001		0.0069		<0.001	<0.001	<0.001	0.197	0.0378	<0.001	<0.001	<0.001

All units mg/l and duplicate values are averaged

Blank cells note samples for wells that were either not install or not sampled

Table 7 - Linam Ranch Gas Plant Summary of Historical Results for Ethylbenzene

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	0.001	<0.001	<0.001											
11/3/1992	<0.001			0.7	0.003	0.051								
12/2/1992	<0.001			0.53	0.0082	0.058								
1/12/1994	0.0021			0.5	0.160	0.096		<0.005						
5/17/1995	<0.002	<0.001	<0.001	<0.2	0.138	0.087	<0.001	<0.001	<0.001	0.049	<0.001	<0.001	<0.001	<0.001
11/14/1995									<0.001	<0.001	<0.001	<0.001	<0.001	0.001
1/17/1996									<0.001	1.140	<0.001	0.002	<0.001	<0.001
4/24/1996									<0.001	1.190	1.170	<0.002	<0.001	<0.001
1/22/1997									<0.001	0.294	<0.005	<0.001	<0.001	<0.001
8/15/1997									<0.001	0.479	<0.01	0.002	<0.001	<0.001
1/22/1998									<0.001	0.802	<0.001	<0.001	<0.001	<0.001
7/20/1998									<0.001	0.777	0.008	<0.001	<0.001	<0.001
2/9/1999			<0.001						<0.001	0.516	<0.005	<0.001	<0.001	<0.001
8/25/1999	<0.005	<0.005	<0.001		0.262		<0.005	<0.001	<0.005	0.557	0.001	<0.001	<0.001	<0.001
2/22/2000	<0.005	<0.005	<0.001		0.13		<0.005	<0.005	<0.005	0.164	<0.005	0.002	<0.001	<0.001
8/18/2000	<0.001	<0.001	<0.005		0.006		<0.005	<0.001	<0.005	0.072	<0.005	<0.005	<0.005	<0.005
2/7/2001	<0.005	<0.005	<0.005		0.084		<0.005	<0.005	<0.005	0.102	<0.005	<0.001	<0.001	<0.005
8/2/2001	<0.001	<0.001	<0.001		<0.005		<0.005	<0.001	<0.001	0.119	<0.001	<0.001	<0.001	<0.001
3/11/2002	<0.001	<0.001	<0.001	0.450	0.097		<0.001	<0.001	<0.001	0.251	<0.001	<0.001	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	0.526	0.588	0.134	<0.005	<0.001	<0.001	0.290	<0.001	<0.001	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	0.520	0.072	0.148	<0.005	<0.001	<0.001	0.303	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	0.259	0.182		<0.001	<0.005	<0.005	0.110	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	0.512	0.241		<0.001	<0.001	<0.001	0.047	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	0.403	0.081		<0.001	<0.001	<0.001	0.119	0.001	<0.001	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		0.309		<0.001	<0.001	<0.001	0.888	0.0143	<0.005	<0.001	<0.001
9/29/2005	0.011	<0.001	<0.001		0.267		<0.001	<0.001	<0.001	0.238	0.0061	<0.001	<0.001	<0.001
3/22/2006	0.0013	<0.001	<0.001		0.239		<0.001	<0.001	<0.001	0.241	0.0295	<0.001	<0.005	<0.001
9/21/2006	<0.001	<0.001	<0.001		0.407		<0.001	<0.001	<0.001	0.204	0.0075	<0.001	<0.001	<0.001

All units mg/l and duplicate values are averaged
Blank cells note samples for wells that were either not install or not sampled

Table 8 - Linam Ranch Gas Plant Summary of Historical Results for Total Xylenes

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	<0.001	<0.001	<0.001											
11/3/1992	0.010			1.8	0.034	0.120								
12/2/1992	0.006			1.3	0.037	0.120								
1/12/1994	0.002			1.3	0.490	0.210		<0.005						
5/17/1995	<0.002	<0.001	<0.001	11.4	0.831	0.181	<0.001	<0.001	<0.001	0.169	0.008	<0.001	<0.001	<0.001
11/14/1995									<0.001	0.406	0.011	0.013	<0.001	<0.001
1/17/1996									0.001	1.050	0.047	0.031	<0.001	<0.001
4/24/1996									<0.001	0.127	0.076	<0.002	<0.001	<0.001
1/22/1997									<0.001	8.97	<0.005	0.017	<0.001	<0.001
8/15/1997									<0.001	0.453	<0.01	0.007	<0.001	0.005
1/22/1998									<0.001	0.635	<0.001	0.015	<0.001	<0.001
7/20/1998									<0.001	0.606	0.006	0.010	<0.001	<0.001
2/9/1999			<0.001						<0.001	0.372	<0.005	<0.001	<0.001	<0.001
8/25/1999	0.006	<0.005	<0.001		0.179		<0.005	<0.001	<0.005	0.359	0.002	<0.001	<0.001	<0.001
2/22/2000	0.006	<0.005	<0.001		0.09		<0.005	<0.005	<0.005	0.124	<0.005	0.008	<0.001	<0.001
8/18/2000	0.011	<0.001	<0.005		0.008		<0.005	<0.001	<0.005	0.038	<0.005	<0.005	<0.005	<0.005
2/7/2001	<0.005	<0.005	<0.005		<0.005		<0.005	<0.005	<0.005	0.086	<0.005	<0.001	<0.001	<0.005
8/2/2001	<0.001	<0.001	<0.001		<0.005		<0.005	<0.001	<0.001	<0.02	<0.001	<0.001	<0.001	<0.001
3/11/2002	<0.001	<0.001	<0.001	0.166	<0.001		<0.001	<0.001	<0.001	0.550	<0.001	<0.001	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	<0.100	0.112	0.058	<0.005	<0.001	0.002	0.155	<0.001	<0.001	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	0.151	<0.050	<0.100	<0.005	<0.001	0.003	<0.100	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	<0.200	<0.001		<0.001	<0.005	<0.005	0.044	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	<0.200	0.005		<0.001	<0.001	0.012	0.023	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	<0.100	<0.005		<0.00	<0.001	0.004	0.071	<0.001	<0.001	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		0.298		<0.001	<0.001	0.0049	1.09	0.0146	0.0115	<0.001	<0.001
9/29/2005	0.0081	<0.001	<0.001		0.327		<0.001	<0.001	<0.001	0.353	0.0119	<0.001	<0.001	<0.001
3/22/2006	<0.001	<0.001	<0.001		0.296		<0.001	<0.001	<0.001	0.304	0.0267	<0.001	<0.005	<0.001
9/21/2006	0.0017	<0.001	<0.001		0.178		0.0015	<0.001	<0.001	0.238	0.0205	<0.001	<0.001	<0.001

All units mg/l and duplicate values are averaged

Blank cells note samples for wells that were either not install or not sampled

FIGURES

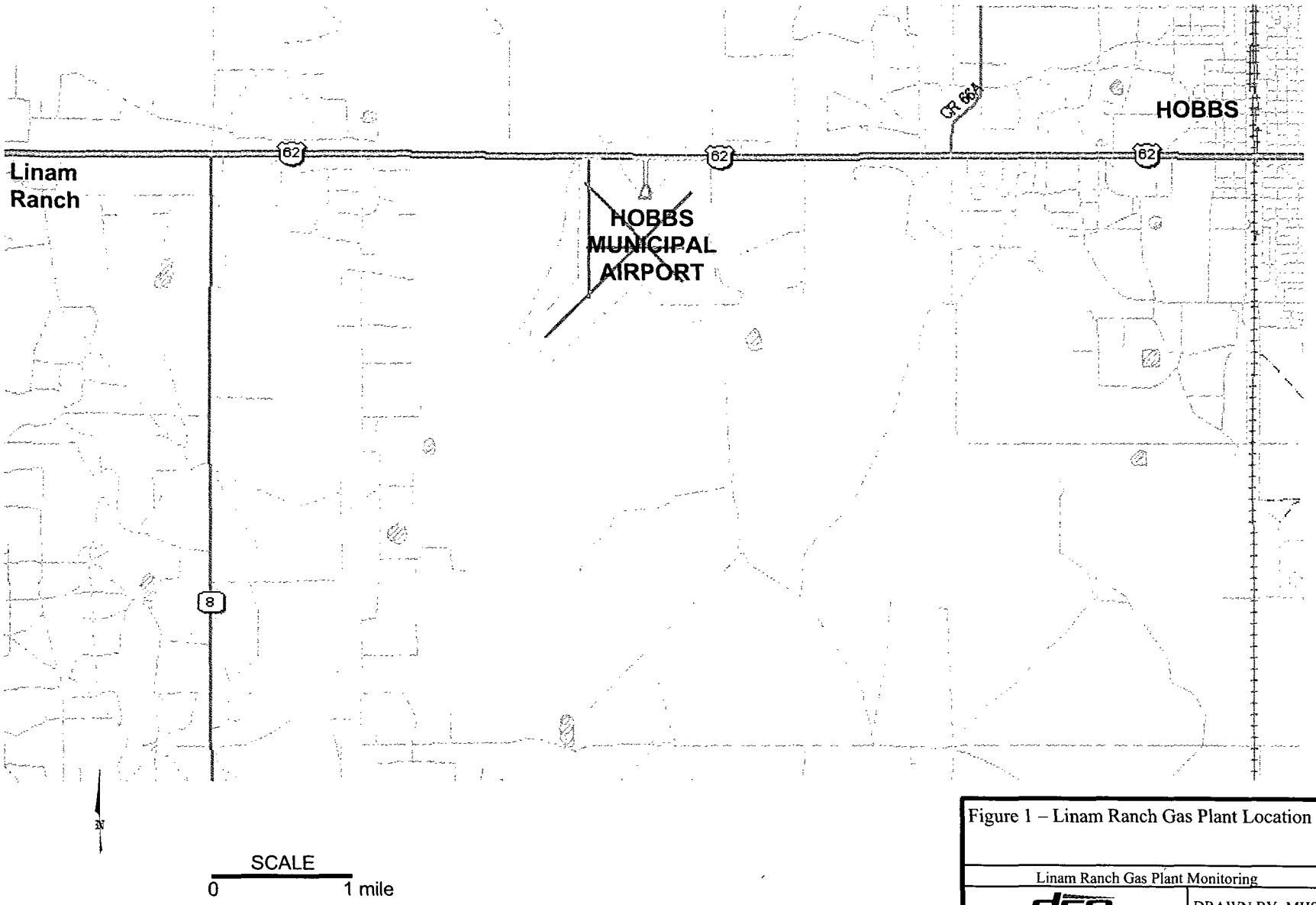


Figure 1 – Linam Ranch Gas Plant Location

Linam Ranch Gas Plant Monitoring

dcp Midstream

DRAWN BY: MHS

DATE: 7/05

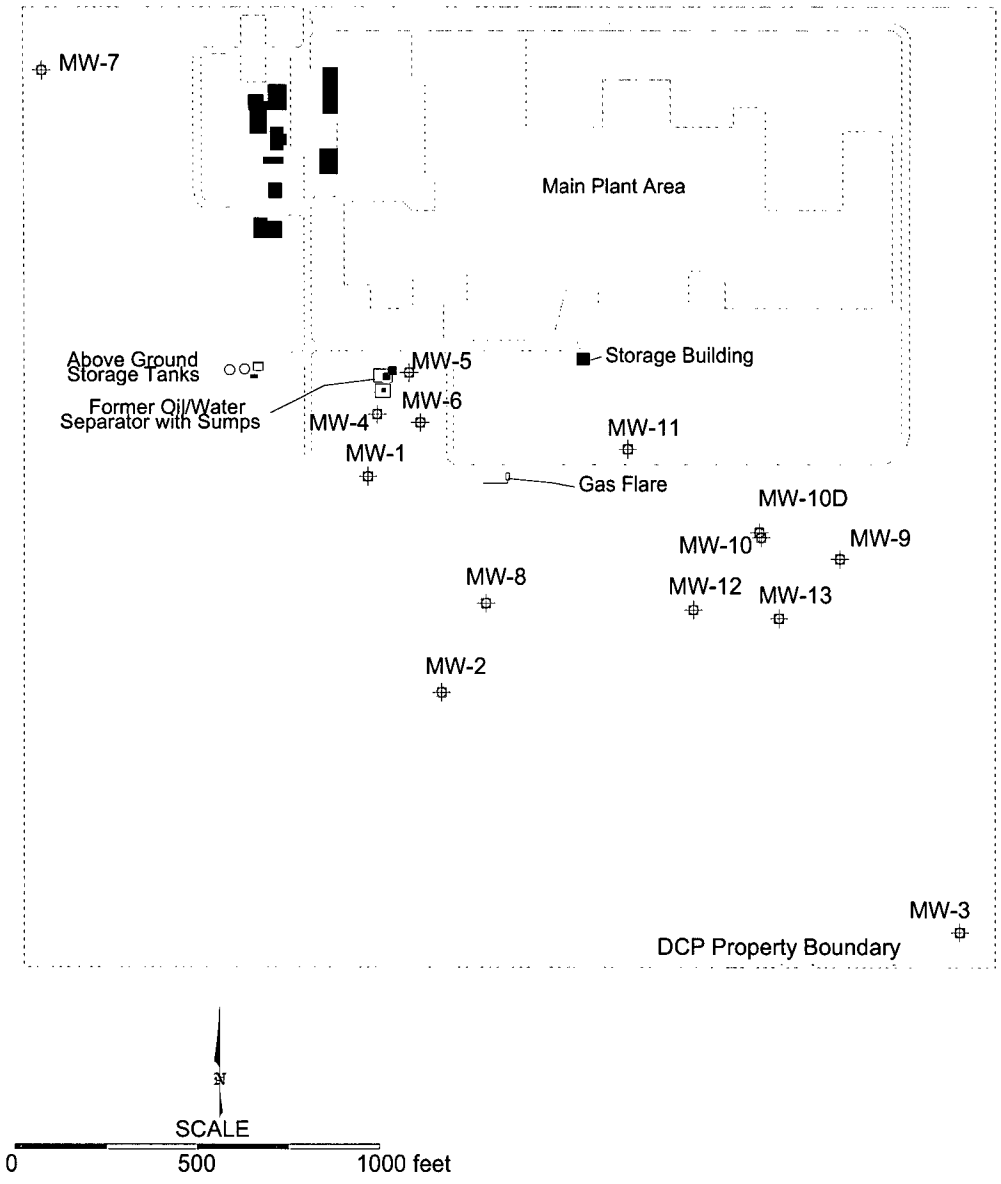


Figure 2 – Monitor Well Locations

Linam Ranch Gas Plant Monitoring

dcp Midstream.

DRAWN BY:	MHS
REVISED:	1/07
DATE:	7/05

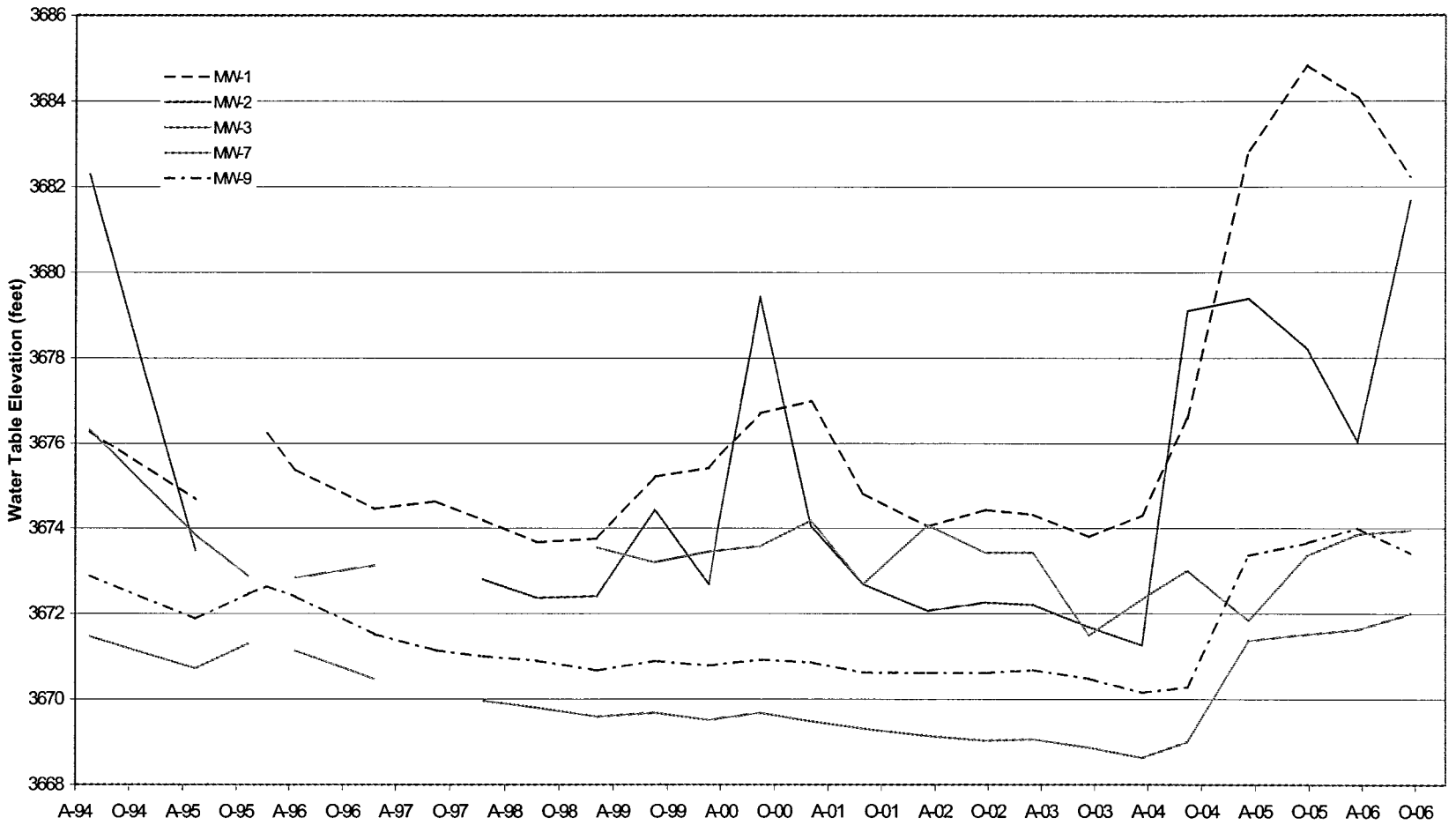


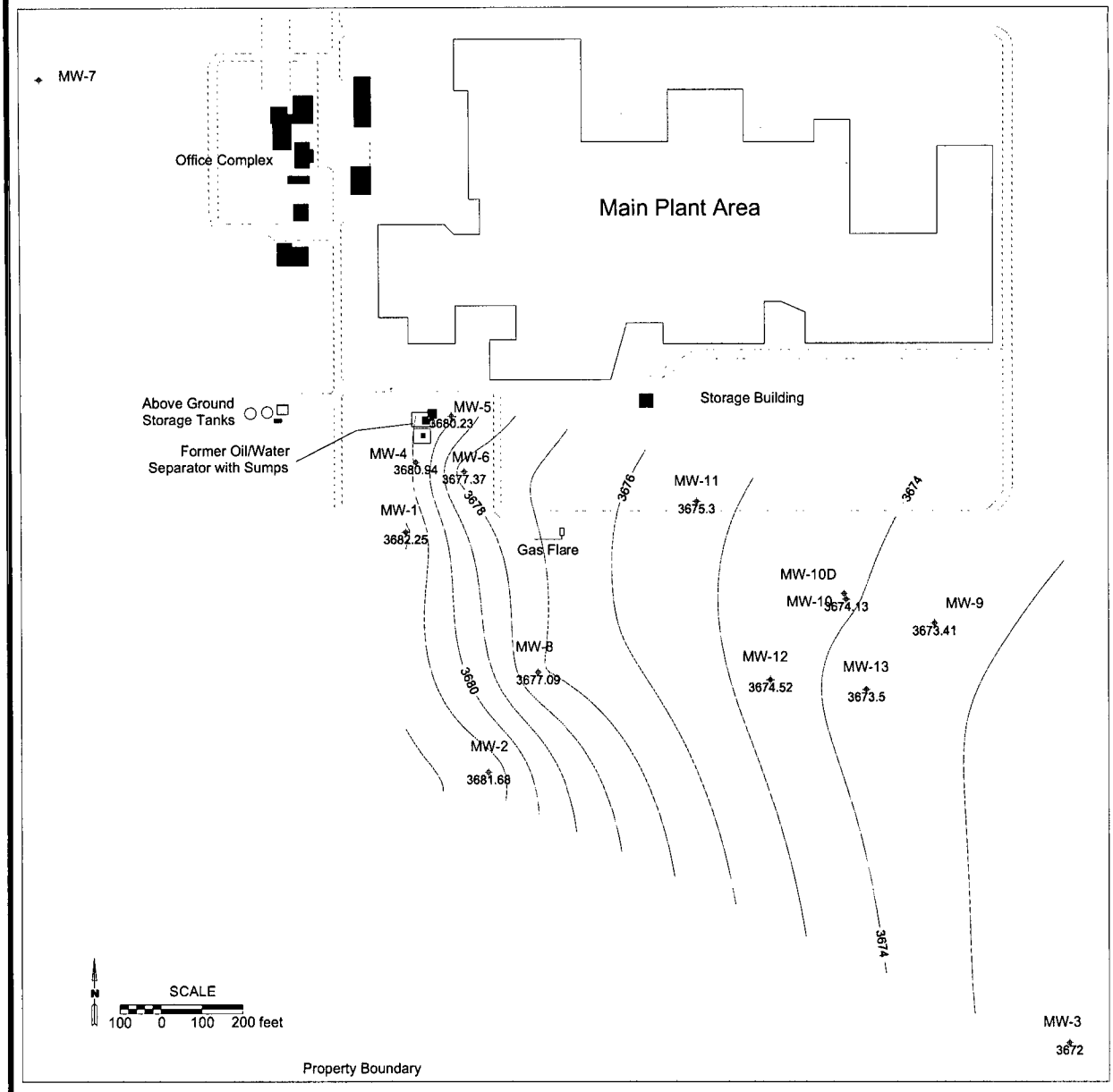
Figure 3 – Linam Ranch Gas Plant Hydrographs

Linam Ranch Gas Plant Monitoring

dcp Midstream.

DRAWN BY: MHS

DATE: 1/07



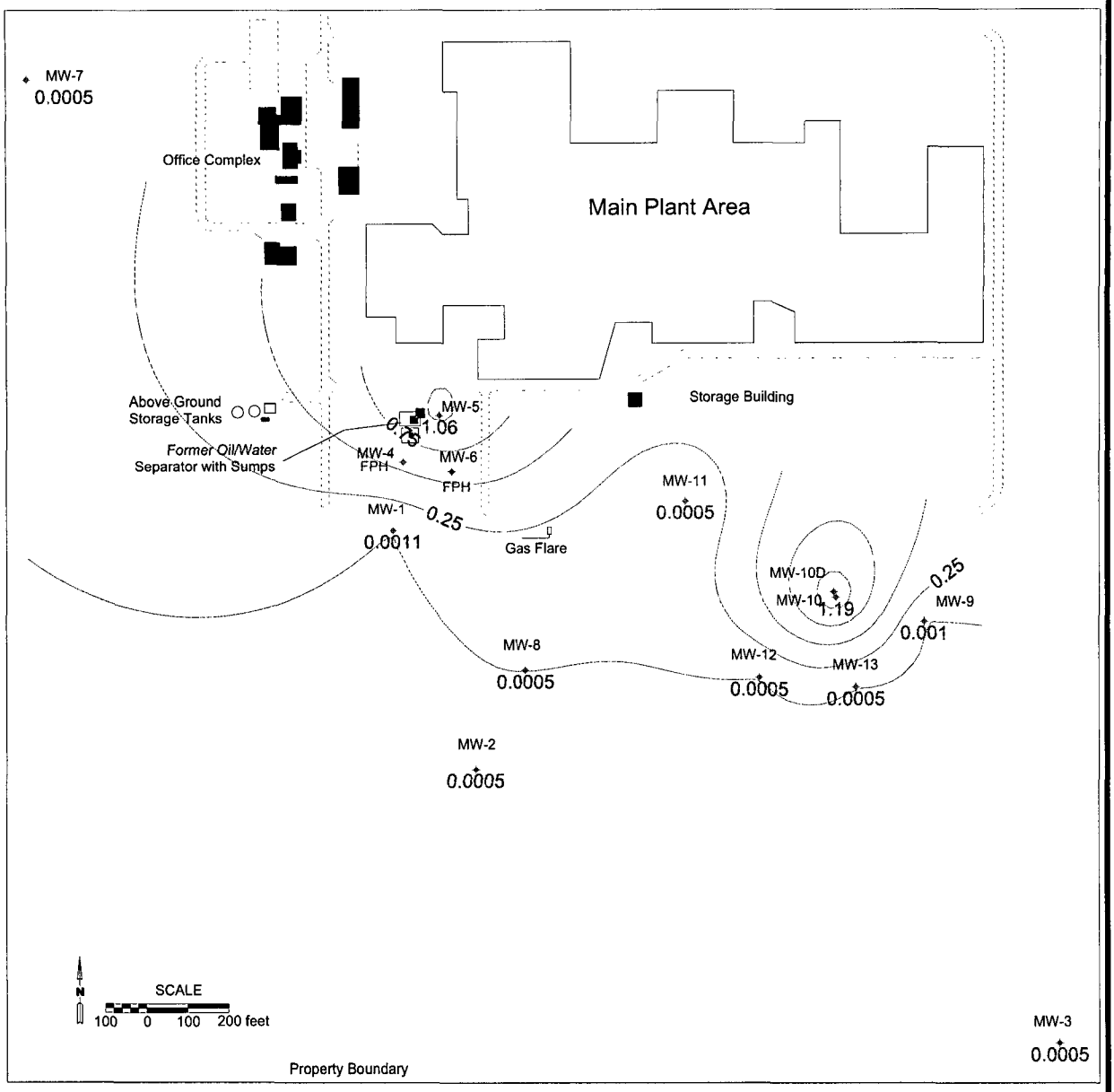
contour interval is 1.0 foot

Figure 4 – September 2006 Water Table Elevation Contours

Linam Ranch Gas Plant Monitoring

dcp Midstream

DRAWN BY:	MHS
REVISED:	
DATE:	1/07



FPH: Free phase hydrocarbons
Contour interval is 0.25 mg/l
Values shown as 0.00 5 are below the 0.001 method reporting limit

Figure 5 – September 2006 Benzene Distribution
Linam Ranch Gas Plant Monitoring

dcp Midstream.

DRAWN BY:	MHS
REVISED:	
DATE:	1/07

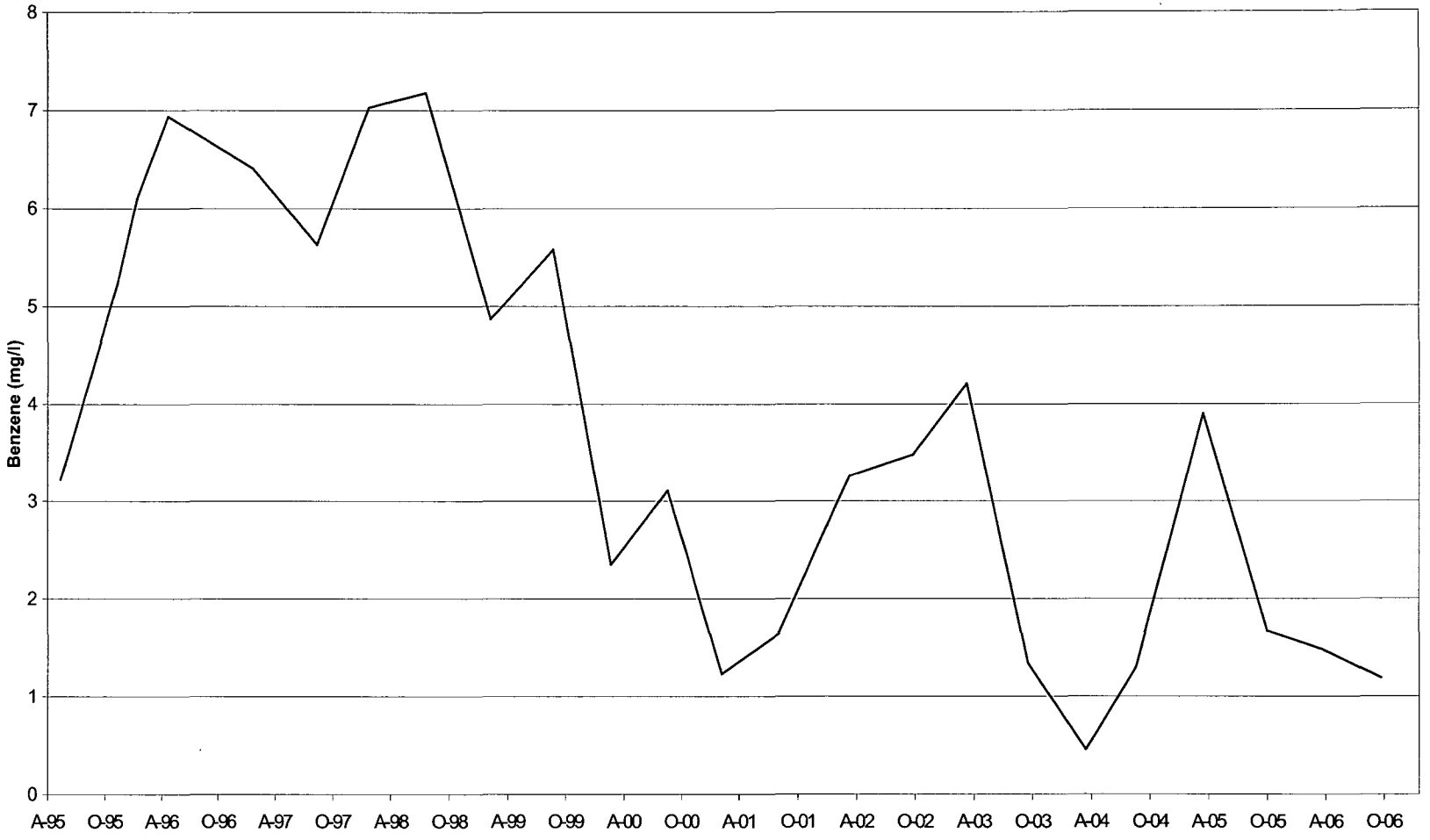


Figure 6 – BTEX Concentrations in MW-10

Linam Ranch Gas Plant Monitoring

dcp Midstream.

DRAWN BY: MHS

DATE: 1/07

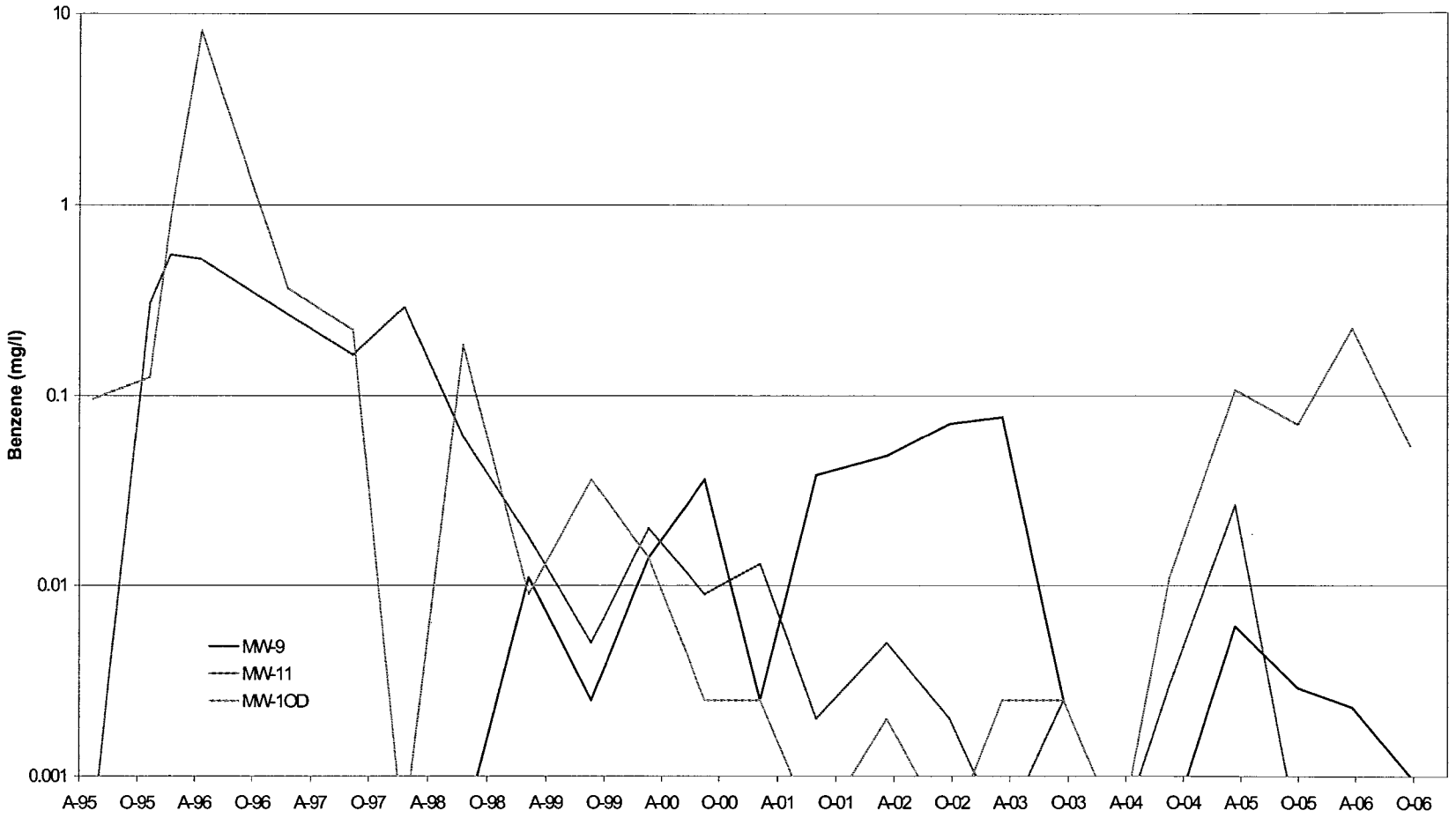


Figure 7 – BTEX Concentrations in MW-9, MW-10D and MW-11

Linam Ranch Gas Plant Monitoring

dcp Midstream.

DRAWN BY: MHS

DATE: 1/07

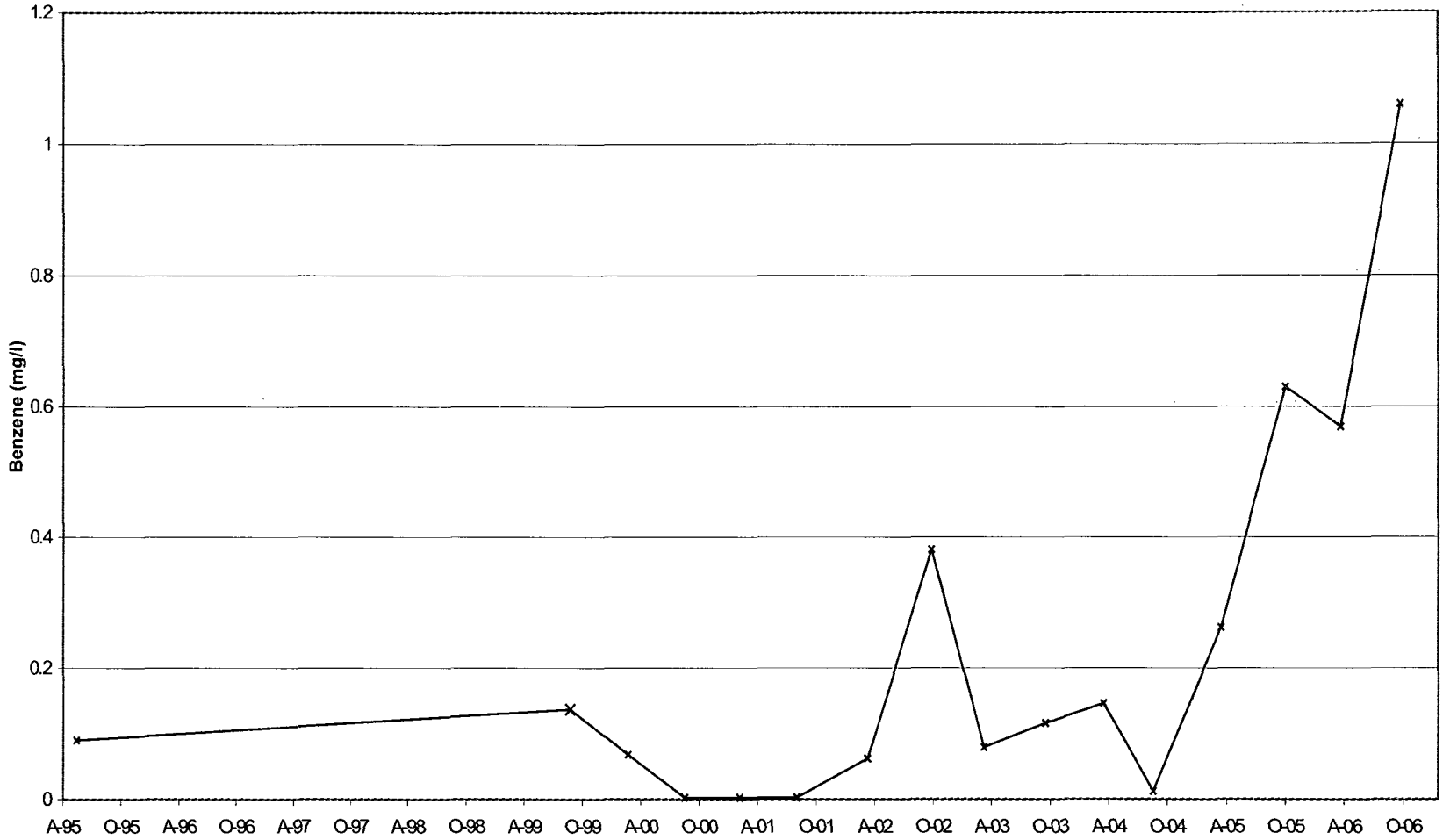


Figure 8 – BTEX Concentrations in MW-5

Linam Ranch Gas Plant Monitoring

dcp Midstream.

DRAWN BY: MHS

DATE: 1/07

FIELD SAMPLING DATA AND

LABORATORY ANALYTICAL REPORT

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 54.20 Feet
DEPTH TO WATER: 37.93 Feet
HEIGHT OF WATER COLUMN: 16.27 Feet
WELL DIAMETER: 2.0 Inch

8.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:34	0.0	-	-	-	-	-	Began Hand Bailing!
9:49	2.6	19.0	1.23	7.04	-	-	
9:55	5.2	19.2	1.33	7.01	-	-	
10:02	7.8	19.5	1.42	6.99	-	-	
0:28	:Total Time (hr:min)		**7.8**	:Total Vol (gal)		**0.28**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060921 1005

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 50.50 Feet
DEPTH TO WATER: 35.56 Feet
HEIGHT OF WATER COLUMN: 14.94 Feet
WELL DIAMETER: 2.0 Inch

7.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
10:50	0.0	-	-	-	-	-	Began Hand Bailing!
10:54	2.6	20.7	0.44	7.33	-	-	
10:57	5.2	20.1	0.45	7.32	-	-	
11:01	7.8	19.8	0.46	7.32	-	-	
0:11	:Total Time (hr:min)		**7.8**	:Total Vol (gal)		**0.71**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060921 1105

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 55.30 Feet
DEPTH TO WATER: 45.70 Feet
HEIGHT OF WATER COLUMN: 9.60 Feet
WELL DIAMETER: 2.0 Inch

4.7 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
12:28	0.0	-	-	-	-	-	Began Hand Bailing!
12:32	1.6	20.6	0.35	7.72	-	-	
12:37	3.2	20.4	0.38	7.71	-	-	
12:42	4.8	20.3	0.37	7.67	-	-	
0:14	:Total Time (hr:min)		**4.8**	:Total Vol (gal)		**0.34**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060921 1245

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.20 Feet
DEPTH TO WATER: 43.37 Feet
HEIGHT OF WATER COLUMN: 11.83 Feet
WELL DIAMETER: 4.0 Inch

23.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
11:57	0.0	-	-	-	-	-	Began Hand Bailing!
12:04	8.0	22.8	2.36	6.81	-	-	
12:13	16.0	22.9	2.53	6.81	-	-	
12:22	24.0	22.9	2.57	6.84	-	-	
0:25	:Total Time (hr:min)		**24**	:Total Vol (gal)		**0.96**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060922 1225

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 62.50 Feet
DEPTH TO WATER: 56.89 Feet
HEIGHT OF WATER COLUMN: 5.61 Feet
WELL DIAMETER: 2.0 Inch

2.7 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:05	0.0	-	-	-	-	-	Began Hand Bailing!
9:08	1.0	18.9	1.06	7.08	-	-	
9:14	2.0	20.1	1.07	7.17	-	-	
9:19	3.0	20.2	1.07	7.19	-	-	
0:14	:Total Time (hr:min)		**3**	:Total Vol (gal)		**0.21**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060921 0920

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 58.30 Feet
DEPTH TO WATER: 39.09 Feet
HEIGHT OF WATER COLUMN: 19.21 Feet
WELL DIAMETER: 4.0 Inch

37.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
11:28	0.0	-	-	-	-	-	Began Hand Bailing!
11:38	12.0	21.5	0.56	7.24	-	-	
11:50	24.0	19.9	0.59	7.33	-	-	
12:03	37.0	19.9	0.60	7.31	-	-	
0:35	:Total Time (hr:min)		**37**	:Total Vol (gal)		**1.05**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060921 1210

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 59.10 Feet
DEPTH TO WATER: 49.07 Feet
HEIGHT OF WATER COLUMN: 10.03 Feet
WELL DIAMETER: 2.0 Inch

4.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
10:31	0	-	-	-	-	-	Began Hand Bailing!
10:34	1.7	20.9	1.17	6.85	-	-	
10:40	3.4	20.7	1.17	6.86	-	-	
10:44	5.1	20.4	1.17	6.85	-	-	
0:13	:Total Time (hr:min)		**5.1**	:Total Vol (gal)		**0.39**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060922 1045

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 65.00 Feet
DEPTH TO WATER: 48.77 Feet
HEIGHT OF WATER COLUMN: 16.23 Feet
WELL DIAMETER: 4.0 Inch

31.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
15:46	0.0	-	-	-	-	-	Began Hand Bailing!
15:57	12.0	22.9	1.57	7.15	-	-	
16:12	24.0	22.0	1.60	7.31	-	-	
16:29	36.0	22.0	1.60	7.28	-	-	
0:43	:Total Time (hr:min)		**36**	:Total Vol (gal)		**0.83**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060921 1640

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10d**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 79.00 Feet
DEPTH TO WATER: 49.79 Feet
HEIGHT OF WATER COLUMN: 29.21 Feet
WELL DIAMETER: 2.0 Inch

14.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:29	0.0	-	-	-	-	-	Began Hand Bailing!
9:42	5.0	21.1	1.24	7.30	-	-	
9:57	10.0	21.3	1.21	7.32	-	-	
10:11	15.0	21.7	1.20	7.15	-	-	
0:42	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.36**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060922 1015

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 62.80 Feet
DEPTH TO WATER: 49.23 Feet
HEIGHT OF WATER COLUMN: 13.57 Feet
WELL DIAMETER: 4.0 Inch

26.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
11:07	0.0	-	-	-	-	-	Began Hand Bailing!
11:17	9.0	21.8	1.37	6.93	-	-	
11:28	18.0	21.3	1.32	6.96	-	-	
11:38	27.0	21.4	1.31	6.94	-	-	
0:31	:Total Time (hr:min)		**27**	:Total Vol (gal)		**0.87**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060922 1140

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-12**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.30 Feet
DEPTH TO WATER: 48.32 Feet
HEIGHT OF WATER COLUMN: 9.98 Feet
WELL DIAMETER: 4.0 Inch

19.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
14:04	0.0	-	-	-	-	-	Began Hand Bailing!
14:11	7.0	21.3	1.13	6.83	-	-	
14:20	14.0	20.8	1.23	6.85	-	-	
14:27	21.0	20.5	1.23	6.83	-	-	
0:23	:Total Time (hr:min)		**21**	:Total Vol (gal)		**0.91**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060921 1430

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/21/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 50.49 Feet
HEIGHT OF WATER COLUMN: 12.51 Feet
WELL DIAMETER: 4.0 Inch

24.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
14:49	0.0	-	-	-	-	-	Began Hand Bailing!
14:51	8.0	21.9	1.49	6.75	-	-	
15:01	16.0	20.6	1.55	6.96	-	-	
15:12	25.0	20.7	1.55	6.94	-	-	
0:23	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.08**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060922 1520

ANALYSES: BTEX (8021-B)

COMMENTS: Collected MS/MSD Samples!

Analytical and Quality Control Report

Mike Stewart
American Environmental Consulting
6885 South Marshall Street
Suite 3
Littleton, CO, 80128

Report Date: September 28, 2006

Work Order: 6092515

Project Location: Lea County,NM
Project Name: Linam Ranch Gas Plant
Project Number: Linam Ranch Gas Plant/Duke Energy Field Services

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
104363	MW-7 (0609210920)	water	2006-09-21	09:20	2006-09-25
104364	MW-1 (0609211005)	water	2006-09-25	10:05	2006-09-25
104365	MW-2 (0609211105)	water	2006-09-21	11:05	2006-09-25
104366	MW-8 (0609211210)	water	2006-09-21	12:10	2006-09-25
104367	MW-3 (0609211245)	water	2006-09-21	12:45	2006-09-25
104368	MW-12 (0609211430)	water	2006-09-21	14:30	2006-09-25
104369	MW-13 (0609211520)	water	2006-09-21	15:20	2006-09-25
104370	MW-10 (0609211640)	water	2006-09-21	16:40	2006-09-25
104371	Duplicate (0609211800)	water	2006-09-21	18:00	2006-09-25
104372	MW-10d (0609221015)	water	2006-09-21	10:15	2006-09-25
104373	MW-9 (0609221045)	water	2006-09-22	10:45	2006-09-25
104374	MW-11 (0609221140)	water	2006-09-22	11:40	2006-09-25
104375	MW-5 (0609221225)	water	2006-09-22	12:25	2006-09-25
104376	Trip Blank	water	2006-09-22	00:00	2006-09-25

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.

Blair Leftwich

Dr. Blair Leftwich, Director

Analytical Report

Sample: 104363 - MW-7 (0609210920)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30408	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		**0.00150**	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0929	mg/L	1	0.100	93	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0812	mg/L	1	0.100	81	70 - 130

Sample: 104364 - MW-1 (0609211005)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.00110**	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		**0.00170**	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0970	mg/L	1	0.100	97	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0878	mg/L	1	0.100	88	70 - 130

Sample: 104365 - MW-2 (0609211105)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0977	mg/L	1	0.100	98	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0864	mg/L	1	0.100	86	70 - 130

Sample: 104366 - MW-8 (0609211210)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0968	mg/L	1	0.100	97	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0848	mg/L	1	0.100	85	70 - 130

Sample: 104367 - MW-3 (0609211245)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0969	mg/L	1	0.100	97	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0841	mg/L	1	0.100	84	70 - 130

Sample: 104368 - MW-12 (0609211430)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100

continued . . .

sample 104368 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0971	mg/L	1	0.100	97	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0839	mg/L	1	0.100	84	70 - 130

Sample: 104369 - MW-13 (0609211520)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0951	mg/L	1	0.100	95	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0804	mg/L	1	0.100	80	70 - 130

Sample: 104370 - MW-10 (0609211640)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30418	Date Analyzed:	2006-09-26	Analyzed By:	LO
Prep Batch:	26509	Sample Preparation:	2006-09-26	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**1.19**	mg/L	10	0.00100
Toluene		**0.200**	mg/L	10	0.00100
Ethylbenzene		**0.205**	mg/L	10	0.00100
Xylene		**0.246**	mg/L	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.858	mg/L	10	1.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)		1.11	mg/L	10	1.00	111	70 - 130

Sample: 104371 - Duplicate (0609211800)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30418	Date Analyzed:	2006-09-26	Analyzed By:	LO
Prep Batch:	26509	Sample Preparation:	2006-09-26	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**1.18**	mg/L	10	0.00100
Toluene		**0.193**	mg/L	10	0.00100
Ethylbenzene		**0.202**	mg/L	10	0.00100
Xylene		**0.229**	mg/L	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.859	mg/L	10	1.00	86	70 - 130
4-Bromofluorobenzene (4-BFB)		1.10	mg/L	10	1.00	110	70 - 130

Sample: 104372 - MW-10d (0609221015)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.0537**	mg/L	5	0.00100
Toluene		**0.0378**	mg/L	5	0.00100
Ethylbenzene		**0.00750**	mg/L	5	0.00100
Xylene		**0.0205**	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.481	mg/L	5	0.500	96	70 - 130
4-Bromofluorobenzene (4-BFB)	[1]	0.875	mg/L	5	0.500	175	70 - 130

Sample: 104373 - MW-9 (0609221045)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.00100**	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

[1] Surrogate out due to peak interference.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0845	mg/L	1	0.100	84	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0909	mg/L	1	0.100	91	70 - 130

Sample: 104374 - MW-11 (0609221140)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0971	mg/L	1	0.100	97	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0817	mg/L	1	0.100	82	70 - 130

Sample: 104375 - MW-5 (0609221225)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**1.06**	mg/L	5	0.00100
Toluene		**0.00690**	mg/L	5	0.00100
Ethylbenzene		**0.407**	mg/L	5	0.00100
Xylene		**0.178**	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.464	mg/L	5	0.500	93	70 - 130
4-Bromofluorobenzene (4-BFB)		0.490	mg/L	5	0.500	98	70 - 130

Sample: 104376 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	30383	Date Analyzed:	2006-09-25	Analyzed By:	LO
Prep Batch:	26489	Sample Preparation:	2006-09-25	Prepared By:	LO

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100

continued ...

sample 104376 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0953	mg/L	1	0.100	95	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0825	mg/L	1	0.100	82	70 - 130

Method Blank (1) QC Batch: 30383

QC Batch: 30383 Date Analyzed: 2006-09-25 Analyzed By: LO
Prep Batch: 26489 QC Preparation: 2006-09-25 Prepared By: LO

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000200	mg/L	0.001
Toluene		0.000400	mg/L	0.001
Ethylbenzene		0.000200	mg/L	0.001
Xylene		0.00200	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0989	mg/L	1	0.100	99	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0853	mg/L	1	0.100	85	70 - 130

Method Blank (1) QC Batch: 30408

QC Batch: 30408 Date Analyzed: 2006-09-25 Analyzed By: LO
Prep Batch: 26489 QC Preparation: 2006-09-25 Prepared By: LO

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000200	mg/L	0.001
Toluene		0.000400	mg/L	0.001
Ethylbenzene		0.000200	mg/L	0.001
Xylene		0.00200	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0951	mg/L	1	0.100	95	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0820	mg/L	1	0.100	82	70 - 130

Method Blank (1) QC Batch: 30418

QC Batch: 30418 | Date Analyzed: 2006-09-26 | Analyzed By: LO
Prep Batch: 26509 | QC Preparation: 2006-09-26 | Prepared By: LO

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000200	mg/L	0.001
Toluene		0.000400	mg/L	0.001
Ethylbenzene		<0.000200	mg/L	0.001
Xylene		0.00230	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0932	mg/L	1	0.100	93	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0818	mg/L	1	0.100	82	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 30383 | Date Analyzed: 2006-09-25 | Analyzed By: LO
Prep Batch: 26489 | QC Preparation: 2006-09-25 | Prepared By: LO

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.104	mg/L	1	0.100	<0.000200	104	70 - 130
Toluene	0.103	mg/L	1	0.100	<0.000100	103	70 - 130
Ethylbenzene	0.104	mg/L	1	0.100	<0.000200	104	70 - 130
Xylene	0.321	mg/L	1	0.300	<0.000400	107	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	0.105	mg/L	1	0.100	<0.000200	104	70 - 130	1	20
Toluene	0.104	mg/L	1	0.100	<0.000100	103	70 - 130	1	20
Ethylbenzene	0.104	mg/L	1	0.100	<0.000200	104	70 - 130	0	20
Xylene	0.319	mg/L	1	0.300	<0.000400	107	70 - 130	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0989	0.0982	mg/L	1	0.100	99	98	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0974	0.0961	mg/L	1	0.100	97	96	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 30408 | Date Analyzed: 2006-09-25 | Analyzed By: LO
Prep Batch: 26489 | QC Preparation: 2006-09-25 | Prepared By: LO

continued ...

control spikes continued . . .

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.0994	mg/L	1	0.100	<0.000200	99	70 - 130
Toluene	0.0989	mg/L	1	0.100	<0.000100	99	70 - 130
Ethylbenzene	0.0990	mg/L	1	0.100	<0.000200	99	70 - 130
Xylene	0.305	mg/L	1	0.300	<0.000400	102	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	0.103	mg/L	1	0.100	<0.000200	99	70 - 130	4	20
Toluene	0.102	mg/L	1	0.100	<0.000100	99	70 - 130	3	20
Ethylbenzene	0.102	mg/L	1	0.100	<0.000200	99	70 - 130	3	20
Xylene	0.312	mg/L	1	0.300	<0.000400	102	70 - 130	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0946	0.0946	mg/L	1	0.100	95	95	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0939	0.0946	mg/L	1	0.100	94	95	70 - 130

Laboratory Control Spike (LCS-1)

QC Batch: 30418 | Date Analyzed: 2006-09-26 | Analyzed By: LO
Prep Batch: 26509 | QC Preparation: 2006-09-26 | Prepared By: LO

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.105	mg/L	1	0.100	<0.000200	105	70 - 130
Toluene	0.104	mg/L	1	0.100	<0.000100	104	70 - 130
Ethylbenzene	0.104	mg/L	1	0.100	<0.000200	104	70 - 130
Xylene	0.319	mg/L	1	0.300	<0.000400	106	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	0.102	mg/L	1	0.100	<0.000200	105	70 - 130	3	20
Toluene	0.101	mg/L	1	0.100	<0.000100	104	70 - 130	3	20
Ethylbenzene	0.101	mg/L	1	0.100	<0.000200	104	70 - 130	3	20
Xylene	0.310	mg/L	1	0.300	<0.000400	106	70 - 130	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0947	0.0947	mg/L	1	0.100	95	95	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0951	0.0940	mg/L	1	0.100	95	94	70 - 130

Matrix Spike (MS-1) Spiked Sample: 104369

QC Batch: 30383 | Date Analyzed: 2006-09-25 | Analyzed By: LO
Prep Batch: 26489 | QC Preparation: 2006-09-25 | Prepared By: LO

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.0969	mg/L	1	0.100	<0.000200	97	70 - 130
Toluene	0.0961	mg/L	1	0.100	<0.000100	96	70 - 130
Ethylbenzene	0.0970	mg/L	1	0.100	<0.000200	97	70 - 130
Xylene	0.299	mg/L	1	0.300	<0.000400	100	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	0.103	mg/L	1	0.100	<0.000200	103	70 - 130	6	20
Toluene	0.101	mg/L	1	0.100	<0.000100	101	70 - 130	5	20
Ethylbenzene	0.103	mg/L	1	0.100	<0.000200	103	70 - 130	6	20
Xylene	0.314	mg/L	1	0.300	<0.000400	105	70 - 130	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0971	0.0978	mg/L	1	0.1	97	98	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0950	0.0956	mg/L	1	0.1	95	96	70 - 130

Matrix Spike (MS-1) Spiked Sample: 104380

QC Batch: 30408 | Date Analyzed: 2006-09-25 | Analyzed By: LO
Prep Batch: 26489 | QC Preparation: 2006-09-25 | Prepared By: LO

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Benzene	0.104	mg/L	1	0.100	<0.000200	104	70 - 130
Toluene	0.102	mg/L	1	0.100	0.0002	102	70 - 130
Ethylbenzene	0.104	mg/L	1	0.100	0.0008	103	70 - 130
Xylene	0.323	mg/L	1	0.300	0.0008	107	70 - 130

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Benzene	0.101	mg/L	1	0.100	<0.000200	101	70 - 130	3	20
Toluene	0.0999	mg/L	1	0.100	0.0002	100	70 - 130	2	20
Ethylbenzene	0.102	mg/L	1	0.100	0.0008	101	70 - 130	2	20
Xylene	0.318	mg/L	1	0.300	0.0008	104	70 - 130	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0997	0.0968	mg/L	1	0.1	100	97	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0962	0.0957	mg/L	1	0.1	96	96	70 - 130

Standard (ICV-1)

QC Batch: 30383 Date Analyzed: 2006-09-25 Analyzed By: LO

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.103	103	85 - 115	2006-09-25
Toluene		mg/L	0.100	0.102	102	85 - 115	2006-09-25
Ethylbenzene		mg/L	0.100	0.102	102	85 - 115	2006-09-25
Xylene		mg/L	0.300	0.314	105	85 - 115	2006-09-25

Standard (CCV-1)

QC Batch: 30383 Date Analyzed: 2006-09-25 Analyzed By: LO

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.102	102	85 - 115	2006-09-25
Toluene		mg/L	0.100	0.101	101	85 - 115	2006-09-25
Ethylbenzene		mg/L	0.100	0.100	100	85 - 115	2006-09-25
Xylene		mg/L	0.300	0.309	103	85 - 115	2006-09-25

Standard (ICV-1)

QC Batch: 30408 Date Analyzed: 2006-09-25 Analyzed By: LO

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.104	104	85 - 115	2006-09-25
Toluene		mg/L	0.100	0.103	103	85 - 115	2006-09-25
Ethylbenzene		mg/L	0.100	0.102	102	85 - 115	2006-09-25
Xylene		mg/L	0.300	0.315	105	85 - 115	2006-09-25

Standard (CCV-1)

QC Batch: 30408 Date Analyzed: 2006-09-25 Analyzed By: LO

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.102	102	85 - 115	2006-09-25
Toluene		mg/L	0.100	0.100	100	85 - 115	2006-09-25
Ethylbenzene		mg/L	0.100	0.100	100	85 - 115	2006-09-25
Xylene		mg/L	0.300	0.309	103	85 - 115	2006-09-25

Standard (ICV-1)

QC Batch: 30418 Date Analyzed: 2006-09-26 Analyzed By: LO

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.104	104	85 - 115	2006-09-26
Toluene		mg/L	0.100	0.104	104	85 - 115	2006-09-26
Ethylbenzene		mg/L	0.100	0.104	104	85 - 115	2006-09-26
Xylene		mg/L	0.300	0.322	107	85 - 115	2006-09-26

Standard (CCV-1)

QC Batch: 30418 Date Analyzed: 2006-09-26 Analyzed By: LO

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.102	102	85 - 115	2006-09-26
Toluene		mg/L	0.100	0.101	101	85 - 115	2006-09-26
Ethylbenzene		mg/L	0.100	0.101	101	85 - 115	2006-09-26
Xylene		mg/L	0.300	0.312	104	85 - 115	2006-09-26

Work Order: 6092515
Linam Ranch Gas Plant

Report Date: September 28, 2006
Linam Ranch Gas Plant/Duke Energy Field Services

Pg 1 of 2

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
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TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 6092515

Company Name: American Environmental Consulting
Phone #: 303-948-7733
Address: (Street, City, Zip) 6885 South Marshall, Suite 3, Littleton CO 80128
Fax #: 303-948-7793
Contact Person: Mike Stewart
E-mail:
Invoice to: DEFS
(If different from above) Attn: Daniel Dick
Project #: Duke Energy Field Services
Project Name: Linam Ranch Gas Plant
Project Location (including state): Lea County, New Mexico
Sampler Signature:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B / 602 / 8260B / 624	BTEX 8021B / 602 / ~~8260B / 624~~	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270C / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C / 625	PCB's 8082 / 608	Pesticides 8081A / 608	BOD, TSS, pH	Moisture Content							MS/MSD	Turn Around Time if different from standard	Hold
1043 63	MW-7 (0609210920)	2	40ml	✓				✓				✓		9/21/06	0920		✓																								
64	MW-1 (0609211005)	2	40ml	✓				✓				✓		9/21/06	1005		✓																								
65	MW-2 (0609211105)	2	40ml	✓				✓				✓		9/21/06	1105		✓																								
66	MW-8 (0609211210)	2	40ml	✓				✓				✓		9/21/06	1210		✓																								
67	MW-3 (0609211245)	2	40ml	✓				✓				✓		9/21/06	1245		✓																								
68	MW-12 (0609211430)	2	40ml	✓				✓				✓		9/21/06	1430		✓																								
69	MW-13 (0609211520)	~~2~~ 6	40ml	✓				✓				✓		9/21/06	1520		✓																					✓			
70	MW-10 (0609211640)	2	40ml	✓				✓				✓		9/21/06	1640		✓																								
71	Duplicate (0609211800)	2	40ml	✓				✓				✓		9/21/06	1800		✓																								
72	MW-10d (0609221015)	2	40ml	✓				✓				✓		9/22/06	1015		✓																								
73	MW-9 (0609221045)	2	40ml	✓				✓				✓		9/22/06	1045		✓																								

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	9/25/06	1140			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by: [signature]	Date: 9.25.06	Time: 11:40

LAB USE ONLY
Intact (Y) / N
Headspace Y / N
Temp 4 °
Log-in-Review [initials]

REMARKS:

☐ Dry Weight Basis Required
☐ TRRP Report Required
☐ Check If Special Reporting Limits Are Needed

Carrier # carry. on

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

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Work Order: 6092515
Linam Ranch Gas Plant

Report Date: September 28, 2006
Linam Ranch Gas Plant/Duke Energy Field Services

Pg 2 of 2

6701 Aberdeen Avenue, Ste. 9
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El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 6092515

Company Name: American Environmental Consulting
Phone #: 303-948-7733
Address: (Street, City, Zip) 6885 South Marshall, Suite 3 Littleton, CO 80128
Fax #: 303-948-7793
Contact Person: Mike Stewart
E-mail:
Invoice to: DEFS
(If different from above) Attn: Daniel Dick
Project #: Duke Energy Field Services
Project Name: Linam Ranch Gas Plant
Project Location (including state): Lea County, New Mexico
Sampler Signature:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume / Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B / 602 / 8260B / 624	BTEX 8021B / 602 / ~~8260B / 624~~	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270C / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C / 625	PCB's 8082 / 608	Pesticides 8081A / 608	BOD, TSS, pH	Moisture Content	Turn Around Time if different from standard	Hold
104374	MW-11 (060922 1140)	2	40ml	✓				✓				✓		9/22/06	1140		✓																	
75	MW-5 (060922 1225)	2	40ml	✓				✓				✓		9/22/06	1225		✓																	
76	Trip Blank	1	40ml	✓				✓				✓					✓																	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	9/25/06	1140			
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by: [signature]	Date: 9-25-06	Time: 1140

LAB USE ONLY
Intact: Y N
Headspace: Y N
Temp: 4 °C
Log-in-Review: [initials]

REMARKS:

- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

Carrier # carry-in

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

ORIGINAL COPY

Chavez, Carl J, EMNRD

From: Dick, Daniel I [didick@duke-energy.com]
Sent: Wednesday, November 01, 2006 11:13 AM
To: Chavez, Carl J, EMNRD
Subject: Linam Ranch Annual Groundwater Monitoring Report 2005-2006

Mr. Chavez –

I understand you are now responsible for sites previously under Ben Stone's guidance, including the DEFS Linam Ranch site. Please accept the above referenced report for your review. I have sent a copy to Larry Johnson with the OCD District 1 office as well. A brief transmittal letter is also attached.

I will be providing you with brief summaries for several sites shortly. I hope to schedule meetings along with Steve Weathers, once you've had the opportunity to review the information, to discuss the progress of these projects with you.

Sincerely,

Daniel Dick
Duke Energy Field Services
Environmental Assurance
370, 17th Street, Suite 2500
Denver, CO 80120
Ph: 303-605-1893
Fx: 303-605-1957

Duke Energy® Field Services

370 17th Street, Suite 2500
Denver, Colorado 80202
303-605-1893 – main
303-605-1957 – fax

November 1, 2006

Mr. Carl Chavez, CHMM
New Mexico Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

RE: Annual Summary of 2005-2006 Groundwater Monitoring Results for the Linam Ranch Gas Plant, Lea County, New Mexico Unit B, Section 6, Township 19 South, Range 37 East

Dear Mr. Chavez:

Duke Energy Field Services, LP (DEFS) is pleased to submit for your review one electronic (PDF) copy of the summary report for the third quarter 2005 and first quarter 2006 groundwater sampling effort at the Linam Ranch Gas Plant located in Lea County, New Mexico (Unit B Section 6, Township 19 South, Range 37 East).

The data indicate that the groundwater conditions remain stable. The next monitoring episode was performed in September 2006. The next annual report for the site will be prepared following the completion of the first quarter 2007 monitoring activities and review and validation of the analytical results.

If you have any questions regarding this report, please call me at 303-605-1893.

Sincerely
Duke Energy Field Services, LP

Daniel Dick
Environmental Assurance

Enclosure

cc: Larry Johnson – OCD District Office Hobbs
Lynn Ward – DEFS Midland
Environmental Files

AEC AMERICAN ENVIRONMENTAL CONSULTING, LLC

October 13, 2006

Mr. Daniel Dick
Duke Energy Field Services, LP
370 Seventeenth Street, Suite 2500
Denver, Colorado 80202

Subject: Annual Summary of 2005-2006 Groundwater Monitoring Results
Linam Ranch Gas Plant, Lea County, New Mexico
Unit B, Section 6, Township 19 South, Range 37 East

Dear Daniel:

This letter summarizes the activities completed and data generated during the third quarter 2005 and first quarter 2006 groundwater-sampling episodes at the Duke Energy Field Services, LP (DEFS) Linam Ranch Gas Plant in Lea County New Mexico. The facility is located in New Mexico Oil Conservation Division (OCD) designated Unit B, Section 6, Township 19 South, Range 37 East (Figure 1). The coordinates are 32.6965 degrees north, 103.2883 degrees west. The facility is an active gas-processing plant.

The 14 monitoring well locations are shown on Figure 2. Construction information is included in Table 1.

Both monitoring episodes included the measurement of fluid levels in all monitoring wells and the sampling of all wells that did not contain measurable free phase hydrocarbons (FPH). Trident Environmental of Midland Texas completed the sampling on September 29, 2005 and March 22, 2006 using the standard protocols for this site.

The fluid measurements, FPH thicknesses and corrected groundwater elevations for both episodes are summarized in Table 2. The water-table elevations for the wells containing FPH were estimated using the following formula:

$GWE_{corr} = MGWE + (FPHT*PD)$: where

- MGWE is the actual measured groundwater elevation;
- FPHT is the measured free-phase hydrocarbon thickness; and
- PD is the free phase hydrocarbon density (assumed 0.81 based upon historic data).

This correction provides an accurate estimate of the water table elevation if FPH was not present in the well.

The historic water-table elevation data is summarized in Table 3. Hydrographs for select wells throughout the study area are included on Figure 3. The water tables rose substantially more in MW-1 and MW-2 than in MW-3, MW-7 and MW-9. MW-1 and MW-2 are located in or adjacent to a natural drainage swale that has been blocked in the

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southern part of the site to produce an internally-drained condition. The other three wells lie outside of this area. The above conditions suggest that the unusually high precipitation in 2004-2005 resulted in more groundwater mounding beneath the closed drainage swale than the rest of the site. The water table in both MW-1 and MW-2 began to recede after the precipitation patterns returned to normal. Water tables in the other three wells continue to rise suggesting a more dampened relationship between the precipitation and resulting changes in the water table elevations.

Water-table contour maps for the September 2005 and the March 2006 data as generated by the program Surfer using its kriging option are included as Figures 4 and 5 respectively. Note that well MW-7 was not included in these maps. The water-table elevation in MW-7 is lower than those measured in the wells in the central area (MW-1, MW-4, MW-5 and MW-6). Including this well results in a water-table configuration that suggests radial flow from the center of the property. As discussed below, well MW-7 has never contained measurable benzene, toluene, ethylbenzene or xylenes. This lack of impacts suggests that the relatively higher water table measured in the central part of the site is localized so the contours should not be carried to the northwest.

The water-table contours shown on Figures 4 and 5 are similar in their configuration. Groundwater flow for both situations would be toward the southeastern corner of the property where well MW-3 is located. The gradient also decreased appreciably down gradient from wells MW-2 and MW-8. This change is probably related to the mounding associated with the historic drainage through the center of the facility.

The FPH thickness measurements for September 2005 and March 2006 are included in Table 2. Well MW-4 does not appear to contain a sufficient thickness of FPH to permit active FPH recovery using a product-only system. The thickness measured in MW-6 may warrant restarting FPH collection.

The analytical results for both monitoring episodes are summarized in Table 4. Both of the laboratory reports are attached. The quality control data can be summarized as follows:

- There were no BTEX detections in the March 2006 trip blank. A trip blank was not specifically collected for the September 2005 episode.

- The duplicate values for the September 2005 episode were all under 6 percent relative percentage difference for benzene, ethylbenzene and xylenes. The toluene values differed by 15 percent; however, both values were well below the potentially applicable New Mexico Water Quality Control Commission groundwater standard.

- The original and the duplicate samples collected from MW-12 in March 2006 were both below their respective reporting limits.

- All but four of the 56 surrogate spikes from both episodes were within range.

- The laboratory the matrix spike and matrix spike duplicate analysis were within limits.

The above facts establish that the data is suitable for all intended uses.

The constituents that exceed the potentially applicable New Mexico Water Quality Control Commission groundwater standards are highlighted in Table 4. Only wells MW-10 and MW-10D contained constituents that exceeded these standards.

Benzene isopleths generated by the Surfer program are plotted on Figure 6 for September 2005 and Figure 7 for March 2006. The benzene distribution shown on these two figures is virtually identical. The results from both episodes establish the following facts:

- Any of the dissolved-phase BTEX constituents that emanate from the FPH at MW-4 and MW-6 attenuate to below the method reporting limits before migrating to the vicinity of MW-1 (cross gradient) or MW-8 (down gradient).

- The elevated dissolved-phase BTEX constituents that are measured at MW-10 and MW-10D attenuate to concentrations that are slightly above (MW-9) or below the method reporting limits (MW-12 and MW-13) at the interior down gradient wells.

- The patterns described in the above two bullets have remained constant since the middle of 2001. This consistency indicates that the BTEX distribution and the attenuating mechanism that controls it are equilibrated.

The historical data for all wells is summarized in Table 5 for benzene, Table 6 for toluene, Table 7 for ethylbenzene and Table 8 for total xylenes. Graphs of benzene concentrations verses time are included for MW-10 in Figure 8 and MW-9, MW-10D and MW-11 in Figure 9. Examination of these figures indicates that benzene concentrations in the historic source areas have generally declined after a March 2005 rebound to concentrations measured in the third quarter of 2002. The concentrations in these wells, excepting MW-10D, remain well below their historic maximums measured before 1998.

A benzene-time graph for MW-5, located in a different area of the site, is included as Figure 10. The benzene concentrations in MW-5 and in MW-10D (Figure 9) exhibit an overall increasing trend. Concentrations in these wells that could be indicative of new sources or changed hydrogeologic conditions and will be tracked for long-term trends.

The affected areas are a minimum of 1,000 feet from the nearest down gradient property boundary. DEFS has indicated that the wells containing the FPH are in an active gas processing area so the safety risks inherent to restarting FPH collection more than offset the environmental benefits that would be associated with the activity. The data establishes that dissolved-phase releases from the FPH that is present in this area are attenuated approximately 1,000 feet from the nearest down-gradient property boundary.

The next semi-annual groundwater-monitoring episode is scheduled for the third quarter of 2006. Do not hesitate to contact me if you have any questions or comments on this report or any other aspects of the projects.

Sincerely,
AMERICAN ENVIRONMENTAL CONSULTING, LLC

Michael H. Stewart

Michael H. Stewart, PE
Principal Engineer

MHS/tbm

attachment

TABLES

Table 1 – Linam Ranch GP Well Construction Summary

Well	Well Elevation (Top of Casing)	Well Depth (TOC)	Well Diameter
	(feet)	(feet)	(inches)
MW-1	3718.29	54.20	2
MW-2	3714.80	50.50	2
MW-3	3715.50	55.30	2
MW-4	3720.46	54.13	4
MW-5	3721.53	55.20	4
MW-6	3720.99	54.10	4
MW-7	3728.57	62.50	2
MW-8	3714.18	58.30	4
MW-9	3720.48	59.10	2
MW-10	3720.76	65.00	4
MW-10D	3720.85	79.00	2
MW-11	3722.02	62.80	4
MW-12	3720.60	58.30	4
MW-13	3721.63	63.00	4

Table 2 –Linam Ranch GP 2005-2006 Fluid Gauging Data

September 29, 2005

Well	Depth to Water	Depth to Product	Free Phase Hydrocarbon Thickness	Corrected Water Table Elevation
MW-1	35.35			3684.83
MW-2	39.02			3678.22
MW-3	46.18			3671.52
MW-4	40.07	39.39	0.68	3682.38
MW-5	42.95			3680.65
MW-6	45.62	41.39	4.23	3677.46
MW-7	57.48			3673.36
MW-8	39.17			3677.01
MW-9	48.82			3673.66
MW-10	48.55			3674.35
MW-10D	49.51			3674.03
MW-11	48.99			3675.54
MW-12	48.38			3674.46
MW-13	50.38			3673.61

March 22, 2006

Well	Depth to Water	Depth to Product	Free Phase Hydrocarbon Thickness	Corrected Water Table Elevation
MW-1	36.10			3684.08
MW-2	41.20			3676.04
MW-3	46.07			3671.63
MW-4	40.41	39.65	0.76	3682.04
MW-5	42.94			3680.66
MW-6	45.66	41.97	3.69	3677.42
MW-7	56.98			3673.86
MW-8	40.47			3675.71
MW-9	48.48			3674.00
MW-10	48.21			3674.69
MW-10D	49.49			3674.05
MW-11	48.85			3675.68
MW-12	48.20			3674.64
MW-13	50.43			3673.56

Notes: All units in feet
NP: Free Phase Hydrocarbon not present

Table 3 - Linam Ranch GP Summary of Historic Groundwater Elevation Data

Well	12/1/92	5/22/94	5/17/95	11/14/95	1/17/96	4/24/96	1/22/97	8/15/97	1/22/98	7/20/98	2/9/99	8/24/99	2/21/00	8/17/00	2/6/01
MW-1		3676.28	3674.68		3676.23	3675.37	3674.45	3674.63	3674.19	3673.67	3673.76	3675.21	3675.41	3676.71	3676.99
MW-2		3682.29	3673.49				3673.19		3672.80	3672.37	3672.41	3674.43	3672.68	3679.43	3674.05
MW-3		3671.47	3670.72	3671.30		3671.13	3670.47		3669.96	3669.80	3669.59	3669.68	3669.51	3669.68	3669.48
MW-4	3677.10	3676.96	3675.43	3675.75	3676.27	3675.50	3674.29	3674.12	3674.52	3673.76	3674.45	3675.44	3675.81	3676.07	3675.39
MW-5	3677.65	3677.33	3675.43	3676.62	3676.23	3675.51	3674.35	3673.96	3674.74	3674.21	3674.84	3675.47	3675.84	3675.66	3675.24
MW-6	3676.87	3676.70	3674.87	3676.80	3676.18	3676.37	3674.21	3673.91	3674.21	3673.59	3673.84	3674.86	3675.11	3675.61	3674.75
MW-8		3674.83	3672.73		3674.47	3673.36	3672.78	3672.04	3671.87	3671.61	3671.48	3672.56	3671.93	3674.66	3672.60
MW-9		3672.89	3671.88	3672.46	3672.64	3672.40	3671.52	3671.14	3671.00	3670.90	3670.67	3670.89	3670.78	3670.92	3670.86
MW-10			3672.45	3673.05	3673.08	3672.75	3671.78	3671.41	3671.33	3671.22	3671.02	3671.39	3671.24	3671.53	3671.36
MW-10D			3672.16	3672.91	3672.81	3672.36	3671.43	3671.07	3671.13	3670.99	3670.78	3671.03	3670.98	3671.29	3670.97
MW-11			3673.03	3674.19	3673.88	3673.31	3672.21	3671.81	3672.01	3671.88	3671.68	3672.06	3672.09	3672.47	3672.22
MW-12			3672.37	3673.32	3673.25	3672.75	3671.74	3671.40	3671.34	3671.18	3671.00	3671.59	3671.33	3671.86	3671.50
MW-13			3672.02	3672.57	3672.66	3672.34	3671.43	3671.05	3670.93	3670.80	3670.60	3670.94	3670.74	3671.04	3670.88

Well	8/2/01	3/11/02	9/25/02	3/8/03	9/17/03	3/16/04	8/17/04	3/15/05	9/29/05	3/22/06
MW-1	3674.81	3674.04	3674.43	3674.32	3673.80	3674.30	3676.59	3682.86	3684.83	3684.08
MW-2	3672.69	3672.07	3672.26	3672.21	3671.69	3671.26	3679.10	3679.39	3678.22	3676.04
MW-3	3669.31	3669.14	3669.03	3669.06	3668.87	3668.63	3669.00	3671.37	3671.52	3671.63
MW-4	3674.80	3674.59	3675.13	3674.60	3674.16	3674.04	3675.77	3681.85	3682.38	3682.04
MW-5	3674.82	3675.07	3674.99	3674.81	3674.32	3674.32	3674.32	3680.24	3680.65	3680.66
MW-6	3674.15	3674.30	3674.61	3674.12	3673.55	3673.07	3674.68	3680.13	3677.46	3677.42
MW-8	3671.26	3671.51	3671.59	3671.59	3670.71	3670.67	3673.30	3676.74	3677.01	3675.71
MW-9	3670.62	3670.61	3670.61	3670.68	3670.48	3670.15	3670.28	3673.36	3673.66	3674.00
MW-10	3671.06	3671.10	3671.13	3671.17	3670.87	3670.52	3670.84	3674.42	3674.35	3674.69
MW-10D	3670.76	3670.84	3670.81	3670.85	3670.46	3670.28	3670.51	3673.72	3674.03	3674.05
MW-11	3671.79	3672.02	3672.05	3672.00	3671.49	3671.02	3671.67	3675.45	3675.54	3675.68
MW-12	3671.07	3671.01	3671.09	3671.15	3670.81	3670.36	3671.10	3674.97	3674.46	3674.64
MW-13	3670.58	3670.50	3670.50	3670.57	3670.32	3669.95	3670.31	3673.69	3673.61	3673.56

Table 4 –Linam Ranch GP 2005-2006 Sampling Results

September 2005

Well	Benzene	Toluene	Ethylbenzene	Xylenes
NMWQCC	0.01	0.75	0.75	0.62
MW-1	0.0067	<0.001	0.011	0.0081
MW-2	<0.001	<0.001	<0.001	<0.001
MW-3	<0.001	<0.001	<0.001	<0.001
MW-5	0.63	<0.0100	0.267	0.327
MW-7	<0.001	<0.001	<0.001	<0.001
MW-8	<0.001	<0.001	<0.001	<0.001
MW-9	0.0029	<0.001	<0.001	<0.001
MW-10	**1.7**	0.398	0.243	0.327
MW-10 DUP	**1.63**	0.376	0.232	0.379
MW-10D	**0.0703**	0.0453	0.0061	0.0119
MW-11	<0.001	<0.001	<0.001	<0.001
MW-12	<0.001	<0.001	<0.001	<0.001
MW-13	<0.001	<0.001	<0.001	<0.001

March 2006

Well	Benzene	Toluene	Ethylbenzene	Xylenes
NMWQCC	0.01	0.75	0.75	0.62
MW-1	0.0028	<0.001	0.0013	<0.001
MW-2	<0.001	<0.001	<0.001	<0.001
MW-3	<0.001	<0.001	<0.001	<0.001
MW-5	0.569	<0.0100	0.239	0.296
MW-7	<0.001	<0.001	<0.001	<0.001
MW-8	<0.001	<0.001	<0.001	<0.001
MW-9	0.0023	<0.001	<0.001	<0.001
MW-10	**1.48**	0.254	0.241	0.304
MW-10D	**0.224**	0.0614	0.0295	0.0267
MW-11	<0.001	<0.001	<0.001	<0.001
MW-12	<0.005	<0.005	<0.005	<0.005
MW-12 DUP	<0.001	<0.001	<0.001	<0.001
MW-13	<0.001	<0.001	<0.001	<0.001
Trip	<0.001	<0.001	<0.001	<0.001

NMWQCC: New Mexico Water Quality Control Commission groundwater standards.
Bolded cells exceed the potentially-applicable NMWQCC standard
All units mg/l

Table 5 - Linam Ranch GP Summary of Historical Results for Benzene

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	0.0053	<0.001	<0.001											
11/3/1992	0.0015			16.0	0.003	0.34								
12/2/1992	0.0013			17.0	0.009	0.52								
1/12/1994	0.0039			18.0	0.300	0.77		<0.001						
5/17/1995	<0.002	<0.001	<0.001	20.9	0.090	0.98	<0.001	<0.001	<0.001	3.225	0.096	<0.001	<0.001	<0.001
11/14/1995									<0.001	5.23	0.125	0.306	<0.001	0.003
1/17/1996									0.001	6.11	0.841	0.549	<0.001	<0.001
4/24/1996									<0.001	6.94	8.14	0.52	<0.001	<0.001
1/22/1997									<0.001	6.41	0.365	0.267	<0.001	0.048
8/15/1997									<0.001	5.63	0.221	0.164	0.001	0.132
1/22/1998									<0.001	7.03	<0.001	0.291	<0.001	0.082
7/20/1998									<0.001	7.18	0.184	0.061	0.002	0.061
2/9/1999			<0.001						0.011	4.87	0.009	0.018	0.001	0.082
8/25/1999	<0.005	<0.005	<0.001		0.137		<0.005	<0.001	<0.005	5.58	0.036	0.005	0.003	0.062
2/22/2000	<0.005	<0.005	<0.001		0.068		<0.005	<0.005	0.014	2.35	0.014	0.02	<0.001	0.08
8/18/2000	<0.001	<0.001	<0.005		<0.005		<0.005	0.002	0.036	3.11	<0.005	0.009	<0.005	0.04
2/7/2001	<0.005	<0.005	<0.005		<0.005		<0.005	<0.005	<0.005	1.23	<0.005	0.013	<0.001	0.023
8/2/2001	0.003	0.007	0.002		<0.005		<0.005	<0.001	0.038	1.64	<0.001	0.002	<0.001	0.002
3/11/2002	<0.001	<0.001	<0.001	17.9	0.062		<0.001	<0.001	0.048	3.26	0.002	0.005	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	18.8	0.381	1.29	<0.005	<0.001	0.071	3.48	<0.001	0.002	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	16.9	0.079	0.16	<0.005	<0.001	0.077	4.21	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	15.8	0.116		<0.001	<0.005	<0.005	1.34	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	17.8	0.146		<0.001	<0.001	<0.001	0.456	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	16.6	0.012		<0.001	<0.001	<0.001	1.3	0.011	0.003	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		0.262		<0.001	<0.001	0.0061	3.9/3.92	0.107	0.0264	<0.001	<0.001
9/29/2005	0.0067	<0.001	<0.001		0.63		<0.001	<0.001	0.0029	1.67	0.0703	<0.001	<0.001	<0.001
3/22/2006	0.0028	<0.001	<0.001		0.569		<0.001	<0.001	0.0023	1.48	0.224	<0.001	<0.005	<0.001

All units mg/l

Blank cells note samples for wells that were either not install or not sampled

Table 6 - Linam Ranch GP Summary of Historical Results for Toluene

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	0.0067	<0.001	0.0021											
11/3/1992	0.0015			8.0	0.0034	0.023								
12/2/1992	0.0014			8.2	0.0041	0.020								
1/12/1994	<0.001			10.0	0.190	0.0029		<0.005						
5/17/1995	<0.002	<0.001	<0.001	1.35	0.014	0.007	<0.001	<0.001	<0.001	0.052	0.004	<0.001	<0.001	<0.001
11/14/1995									<0.001	0.001	0.001	<0.001	<0.001	<0.001
1/17/1996									<0.001	0.863	0.001	0.004	<0.001	<0.001
4/24/1996									<0.001	<0.010	0.046	<0.002	<0.001	<0.001
1/22/1997									<0.001	1.63	<0.005	<0.001	<0.001	<0.001
8/15/1997									<0.001	1.35	<0.01	<0.001	<0.001	<0.001
1/22/1998									<0.001	1.93	<0.001	0.004	<0.001	<0.001
7/20/1998									<0.001	2.34	0.014	<0.001	<0.001	<0.001
2/9/1999			<0.001						<0.001	0.32	<0.005	<0.001	<0.001	<0.001
8/25/1999	<0.005	<0.005	<0.001		0.037		<0.005	<0.001	<0.005	0.658	<0.001	<0.001	<0.001	<0.001
2/22/2000	<0.005	<0.005	<0.001		<0.005		<0.005	<0.005	<0.005	0.129	<0.005	<0.001	<0.001	<0.001
8/18/2000	<0.001	<0.001	<0.005		<0.005		<0.005	<0.001	<0.005	0.025	<0.005	<0.005	<0.005	<0.005
2/7/2001	<0.005	<0.005	<0.005		<0.005		<0.005	<0.005	<0.005	0.082	<0.005	<0.001	<0.001	<0.005
8/2/2001	<0.001	<0.001	<0.001		<0.005		<0.005	<0.001	<0.001	<0.02	<0.001	<0.001	<0.001	<0.001
3/11/2002	<0.001	<0.001	<0.001	<0.100	<0.001		<0.001	<0.001	<0.001	0.178	<0.001	<0.001	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	<0.100	<0.050	<0.050	<0.005	<0.001	<0.001	<0.100	<0.001	<0.001	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	<0.100	<0.050	<0.100	<0.005	<0.001	<0.001	<0.100	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	<0.200	<0.001		<0.001	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	<0.200	<0.001		<0.001	<0.001	<0.001	<0.010	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	<0.100	<0.005		<0.001	<0.001	<0.001	<0.020	<0.001	<0.001	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		<0.005		<0.001	<0.001	<0.001	0.256/0.35	0.0444	<0.005	<0.001	<0.001
9/29/2005	<0.001	<0.001	<0.001		<0.0100		<0.001	<0.001	<0.001	0.39	0.0453	<0.001	<0.001	<0.001
3/22/2006	<0.001	<0.001	<0.001		<0.0100		<0.001	<0.001	<0.001	0.254	0.0614	<0.001	<0.005	<0.001

All units mg/l
Blank cells note samples for wells that were either not install or not sampled

Table 7 - Linam Ranch GP Summary of Historical Results for Ethylbenzene

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	0.001	<0.001	<0.001											
11/3/1992	<0.001			0.7	0.003	0.051								
12/2/1992	<0.001			0.53	0.0082	0.058								
1/12/1994	0.0021			0.5	0.160	0.096		<0.005						
5/17/1995	<0.002	<0.001	<0.001	<0.2	0.138	0.087	<0.001	<0.001	<0.001	0.049	<0.001	<0.001	<0.001	<0.001
11/14/1995									<0.001	<0.001	<0.001	<0.001	<0.001	0.001
1/17/1996									<0.001	1.140	<0.001	0.002	<0.001	<0.001
4/24/1996									<0.001	1.190	1.170	<0.002	<0.001	<0.001
1/22/1997									<0.001	0.294	<0.005	<0.001	<0.001	<0.001
8/15/1997									<0.001	0.479	<0.01	0.002	<0.001	<0.001
1/22/1998									<0.001	0.802	<0.001	<0.001	<0.001	<0.001
7/20/1998									<0.001	0.777	0.008	<0.001	<0.001	<0.001
2/9/1999			<0.001						<0.001	0.516	<0.005	<0.001	<0.001	<0.001
8/25/1999	<0.005	<0.005	<0.001		0.262		<0.005	<0.001	<0.005	0.557	0.001	<0.001	<0.001	<0.001
2/22/2000	<0.005	<0.005	<0.001		0.13		<0.005	<0.005	<0.005	0.164	<0.005	0.002	<0.001	<0.001
8/18/2000	<0.001	<0.001	<0.005		0.006		<0.005	<0.001	<0.005	0.072	<0.005	<0.005	<0.005	<0.005
2/7/2001	<0.005	<0.005	<0.005		0.084		<0.005	<0.005	<0.005	0.102	<0.005	<0.001	<0.001	<0.005
8/2/2001	<0.001	<0.001	<0.001		<0.005		<0.005	<0.001	<0.001	0.119	<0.001	<0.001	<0.001	<0.001
3/11/2002	<0.001	<0.001	<0.001	0.450	0.097		<0.001	<0.001	<0.001	0.251	<0.001	<0.001	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	0.526	0.588	0.134	<0.005	<0.001	<0.001	0.290	<0.001	<0.001	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	0.520	0.072	0.148	<0.005	<0.001	<0.001	0.303	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	0.259	0.182		<0.001	<0.005	<0.005	0.110	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	0.512	0.241		<0.001	<0.001	<0.001	0.047	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	0.403	0.081		<0.001	<0.001	<0.001	0.119	0.001	<0.001	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		0.309		<0.001	<0.001	<0.001	0.841/0.934	0.0143	<0.005	<0.001	<0.001
9/29/2005	0.011	<0.001	<0.001		0.267		<0.001	<0.001	<0.001	0.238	0.0061	<0.001	<0.001	<0.001
3/22/2006	0.0013	<0.001	<0.001		0.239		<0.001	<0.001	<0.001	0.241	0.0295	<0.001	<0.005	<0.001

All units mg/l

Blank cells note samples for wells that were either not install or not sampled

Table 8 - Linam Ranch GP Summary of Historical Results for Total Xylenes

Date	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-10D	MW-11	MW-12	MW-13
9/20/1991	<0.001	<0.001	<0.001											
11/3/1992	0.010			1.8	0.034	0.120								
12/2/1992	0.006			1.3	0.037	0.120								
1/12/1994	0.002			1.3	0.490	0.210		<0.005						
5/17/1995	<0.002	<0.001	<0.001	11.4	0.831	0.181	<0.001	<0.001	<0.001	0.169	0.008	<0.001	<0.001	<0.001
11/14/1995									<0.001	0.406	0.011	0.013	<0.001	<0.001
1/17/1996									0.001	1.050	0.047	0.031	<0.001	<0.001
4/24/1996									<0.001	0.127	0.076	<0.002	<0.001	<0.001
1/22/1997									<0.001	8.97	<0.005	0.017	<0.001	<0.001
8/15/1997									<0.001	0.453	<0.01	0.007	<0.001	0.005
1/22/1998									<0.001	0.635	<0.001	0.015	<0.001	<0.001
7/20/1998									<0.001	0.606	0.006	0.010	<0.001	<0.001
2/9/1999			<0.001						<0.001	0.372	<0.005	<0.001	<0.001	<0.001
8/25/1999	0.006	<0.005	<0.001		0.179		<0.005	<0.001	<0.005	0.359	0.002	<0.001	<0.001	<0.001
2/22/2000	0.006	<0.005	<0.001		0.09		<0.005	<0.005	<0.005	0.124	<0.005	0.008	<0.001	<0.001
8/18/2000	0.011	<0.001	<0.005		0.008		<0.005	<0.001	<0.005	0.038	<0.005	<0.005	<0.005	<0.005
2/7/2001	<0.005	<0.005	<0.005		<0.005		<0.005	<0.005	<0.005	0.086	<0.005	<0.001	<0.001	<0.005
8/2/2001	<0.001	<0.001	<0.001		<0.005		<0.005	<0.001	<0.001	<0.02	<0.001	<0.001	<0.001	<0.001
3/11/2002	<0.001	<0.001	<0.001	0.166	<0.001		<0.001	<0.001	<0.001	0.550	<0.001	<0.001	<0.001	<0.001
9/25/2002	<0.005	<0.001	<0.001	<0.100	0.112	0.058	<0.005	<0.001	0.002	0.155	<0.001	<0.001	<0.001	<0.001
3/10/2003	<0.001	<0.001	<0.001	0.151	<0.050	<0.100	<0.005	<0.001	0.003	<0.100	<0.005	<0.001	<0.001	<0.001
9/17/2003	<0.001	<0.001	<0.001	<0.200	<0.001		<0.001	<0.005	<0.005	0.044	<0.005	<0.005	<0.005	<0.005
3/16/2004	<0.001	<0.001	<0.001	<0.200	0.005		<0.001	<0.001	0.012	0.023	<0.001	<0.001	<0.001	<0.001
8/18/2004	<0.001	<0.001	<0.001	<0.100	<0.005		<0.00	<0.001	0.004	0.071	<0.001	<0.001	<0.001	<0.001
3/15/2005	<0.001	<0.001	<0.001		0.298		<0.001	<0.001	0.0049	1.04/1.14	0.0146	0.0115	<0.001	<0.001
9/29/2005	0.0081	<0.001	<0.001		0.327		<0.001	<0.001	<0.001	0.353	0.0119	<0.001	<0.001	<0.001
3/22/2006	<0.001	<0.001	<0.001		0.296		<0.001	<0.001	<0.001	0.304	0.0267	<0.001	<0.005	<0.001

All units mg/l
Blank cells note samples for wells that were either not install or not sampled

FIGURES

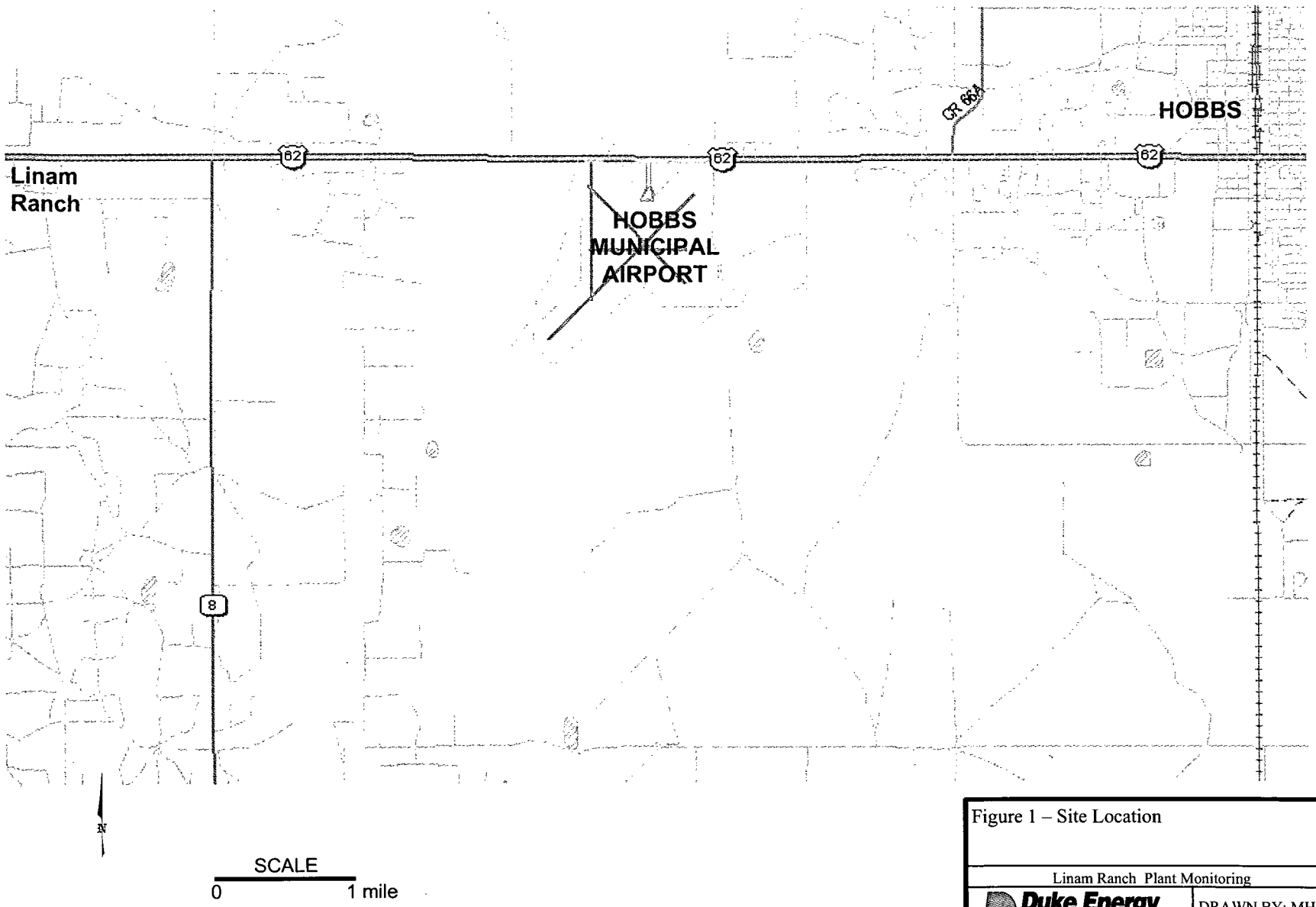


Figure 1 – Site Location

Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY: MHS

DATE: 7/05

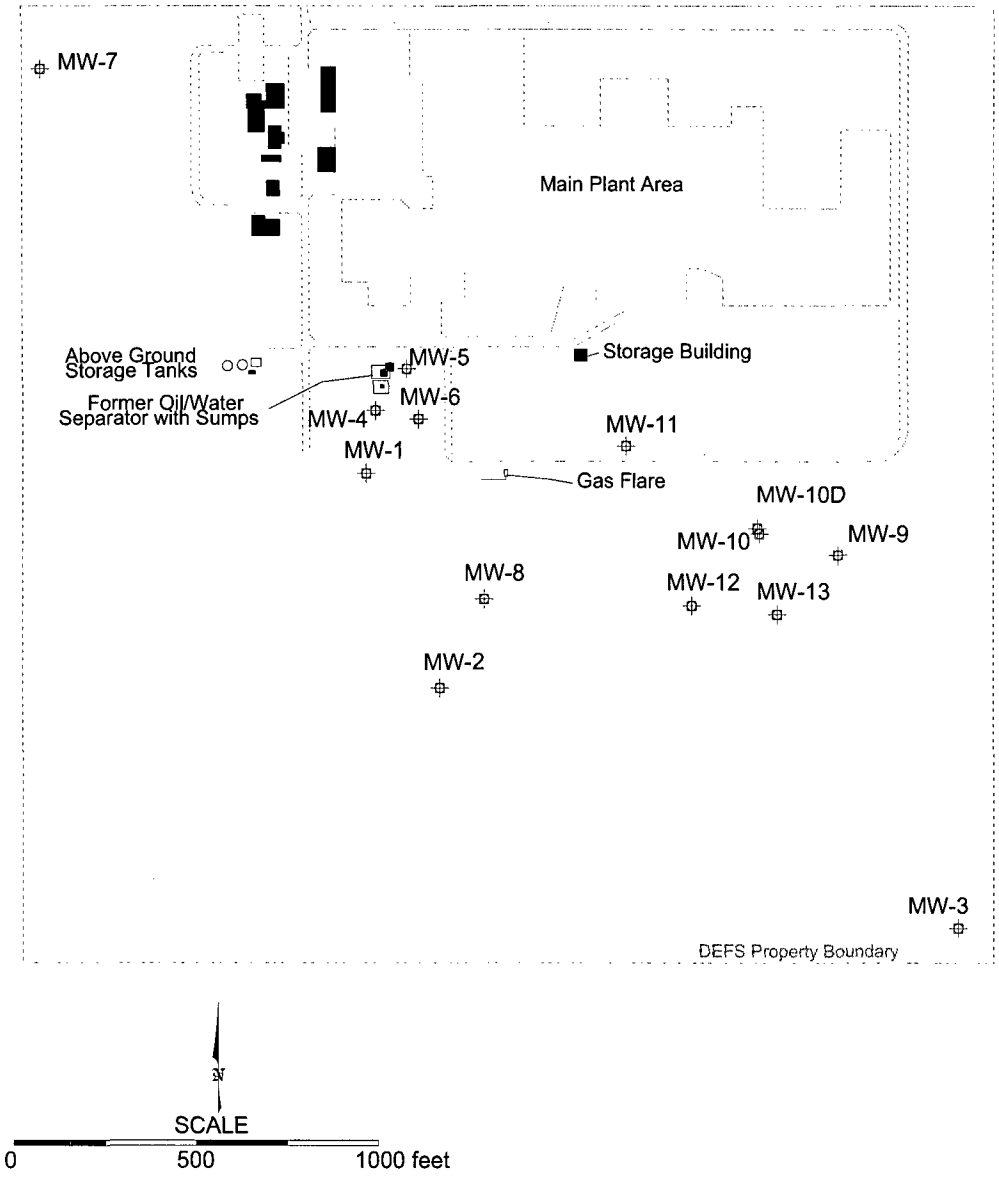


Figure 2 – Monitor Well Locations

Linam Ranch Plant Monitoring

Duke Energy Field Services℠

DRAWN BY: MHS

REVISED:

DATE: 7/05

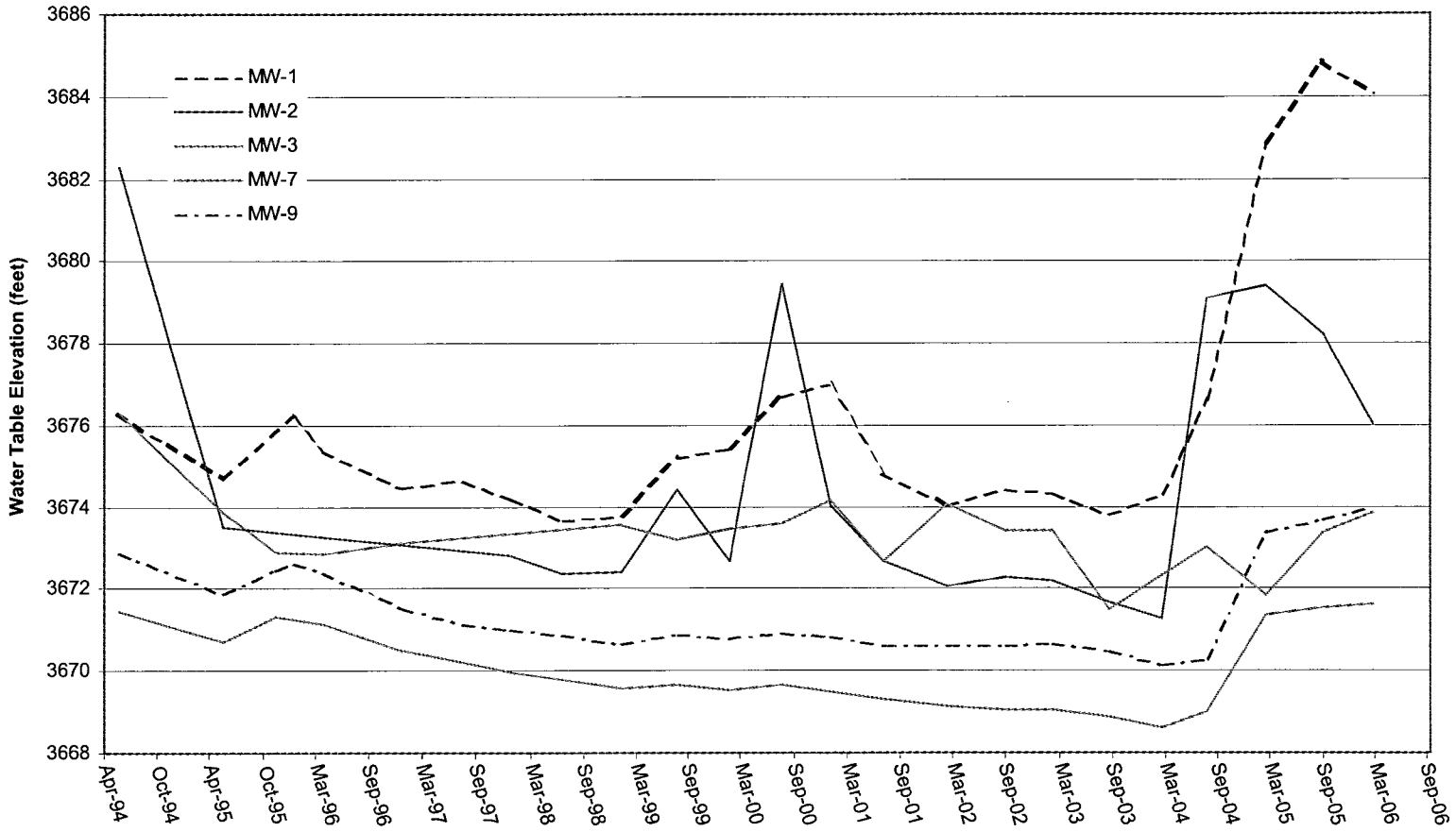


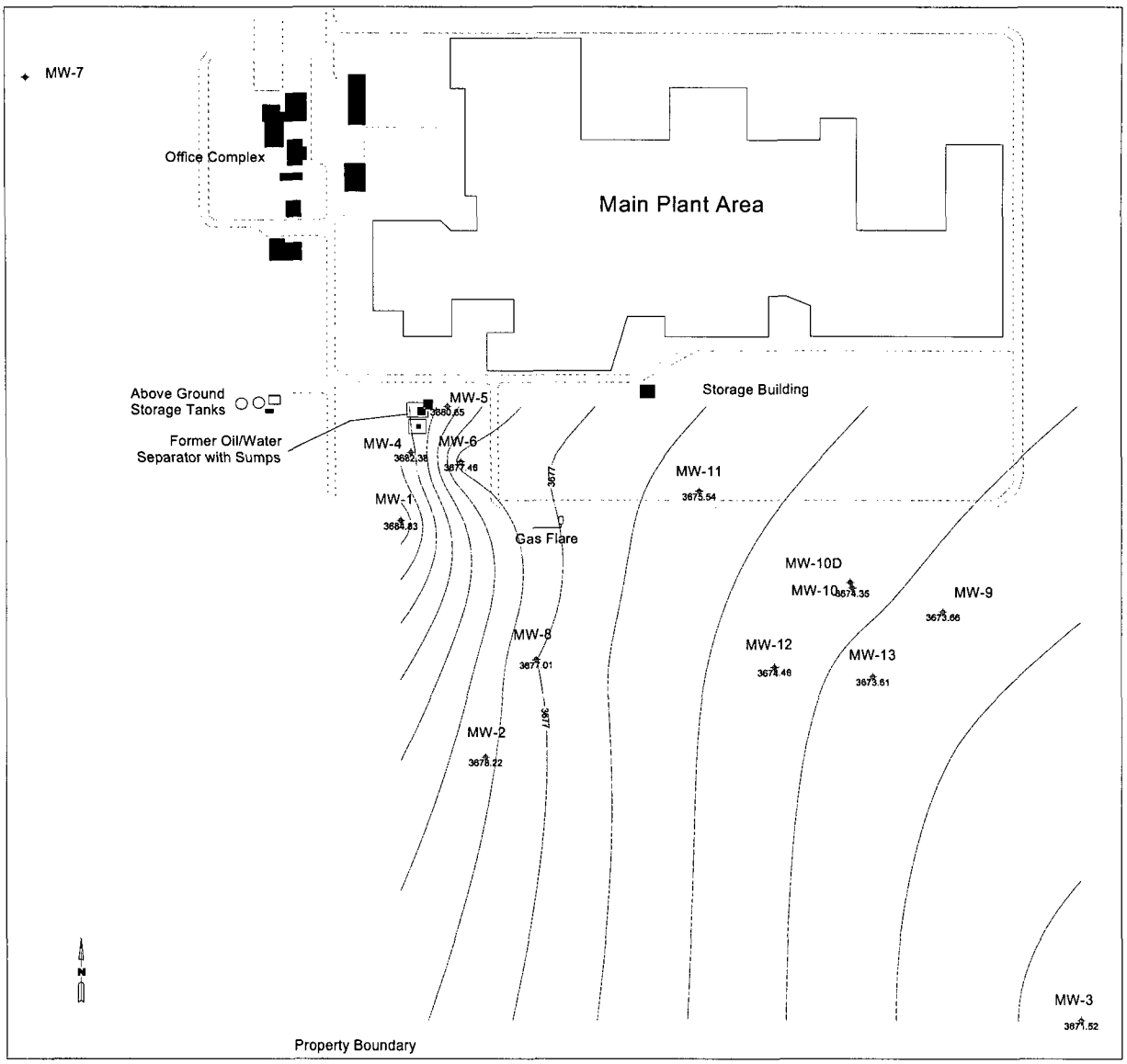
Figure 3 – Linam Ranch Hydrographs

Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY: MHS

DATE: 6/06



Scale:

0 200 feet

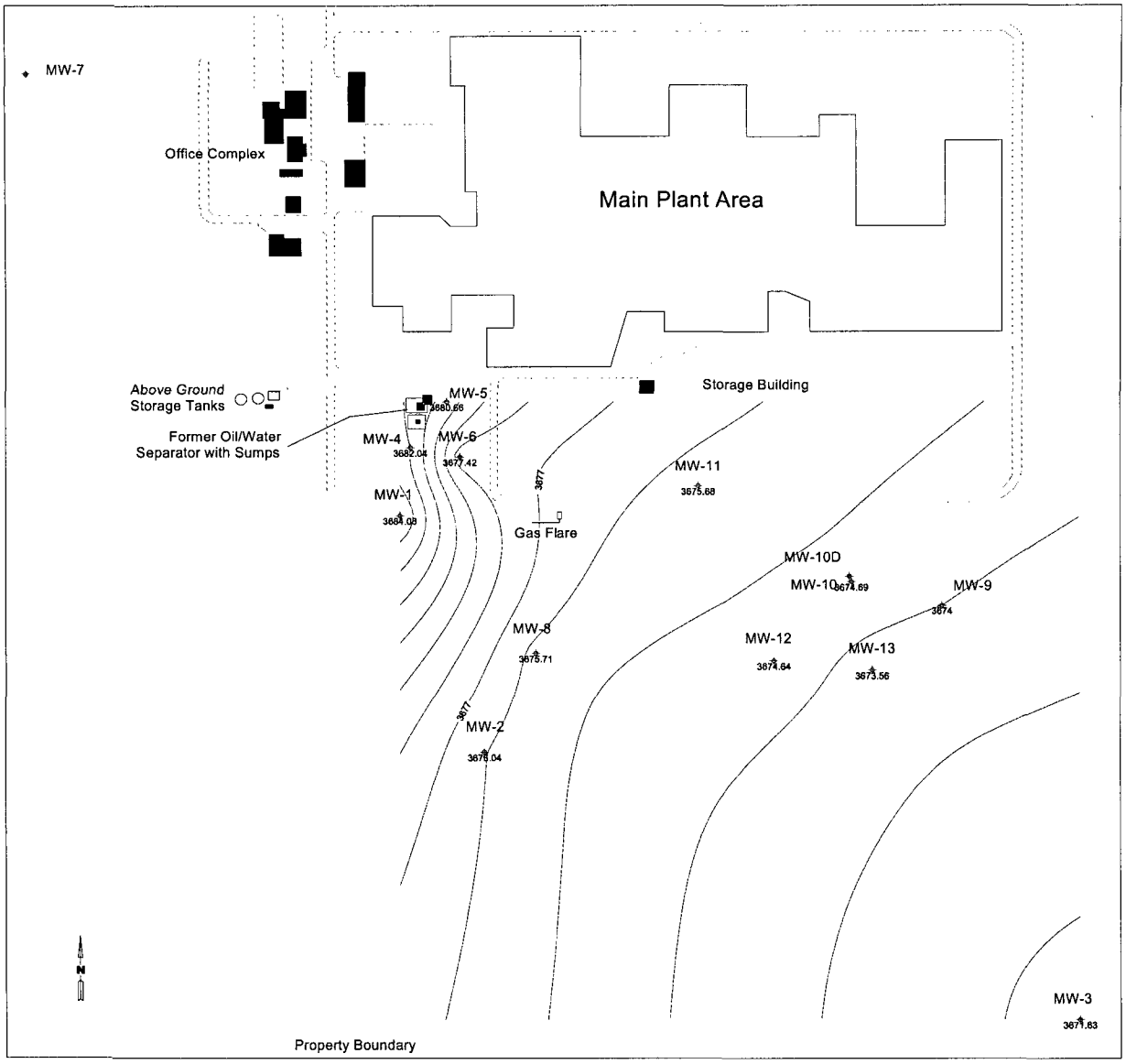
Contour interval 1 foot

Figure 4 – September 2005 Water Table Elevation Contours

Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY:	MHS
REVISED:	
DATE:	6/06



Scale:

0 200 feet

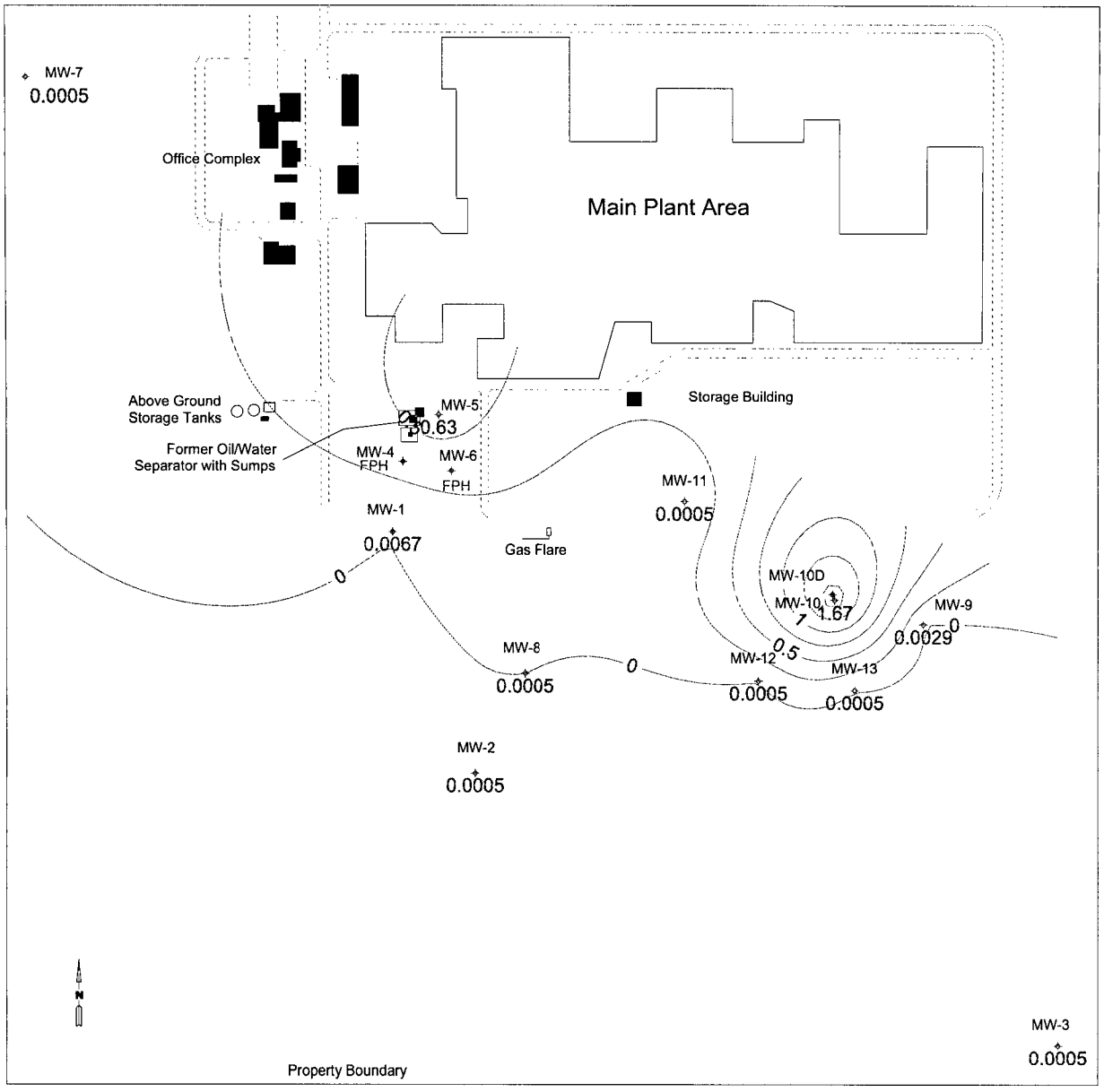
Contour interval 1 foot

Figure 5 – March 2006 Water Table Elevation Contours

Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY:	MHS
REVISED:	
DATE:	6/06



Scale

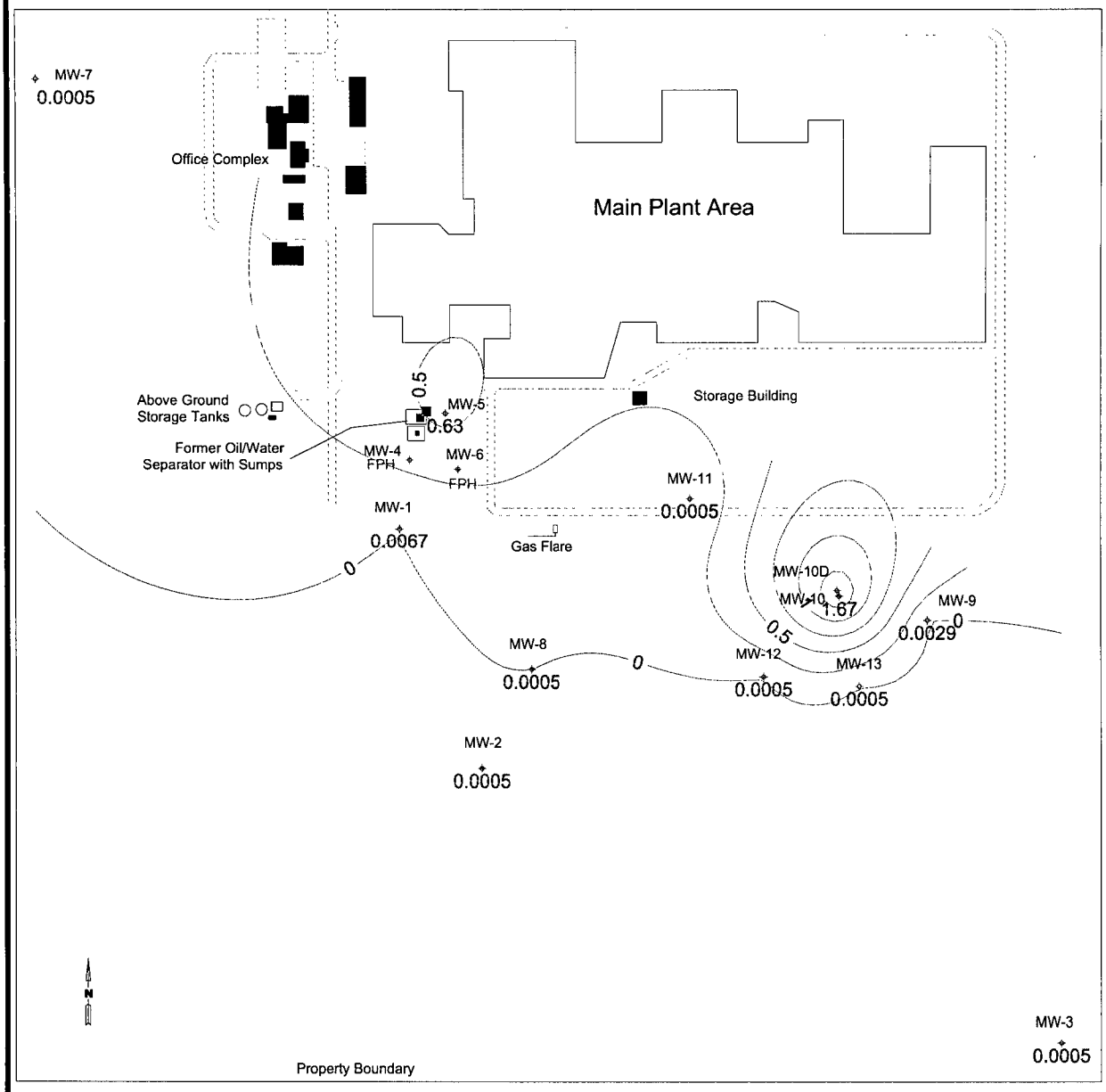
0 200 feet

FPH: Free phase hydrocarbons
Units are mg/l

Figure 6 – September 2005 Benzene Distribution
Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY: MHS
REVISED:
DATE: 6/06



Scale

0 200 feet

FPH: Free phase hydrocarbons
Units are mg/l

Figure 7 – March 2006 Benzene Distribution
Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY: MHS
REVISED:
DATE: 6/06

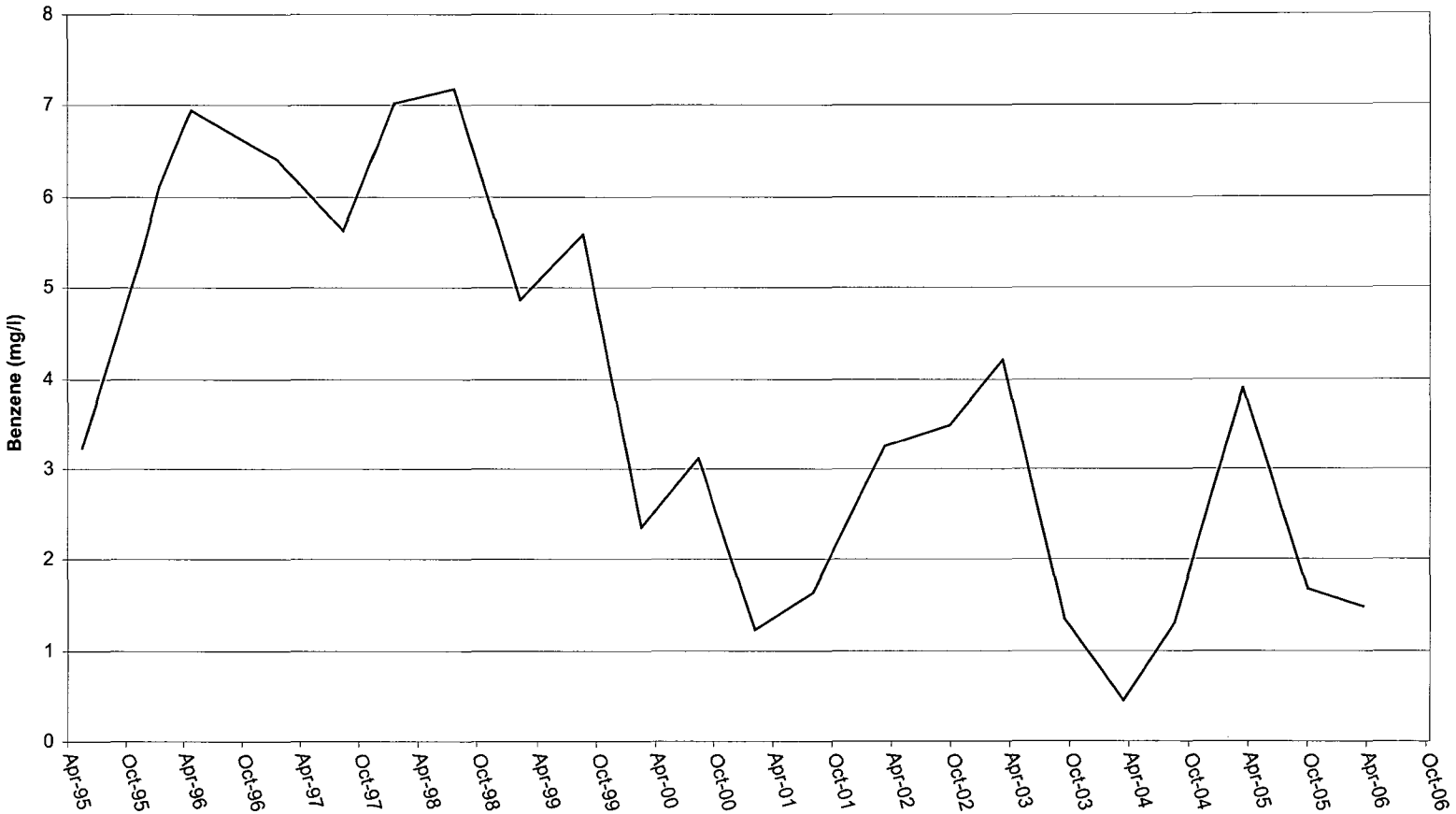


Figure 8 – BTEX Concentrations in MW-10

Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY: MHS

DATE: 6/06

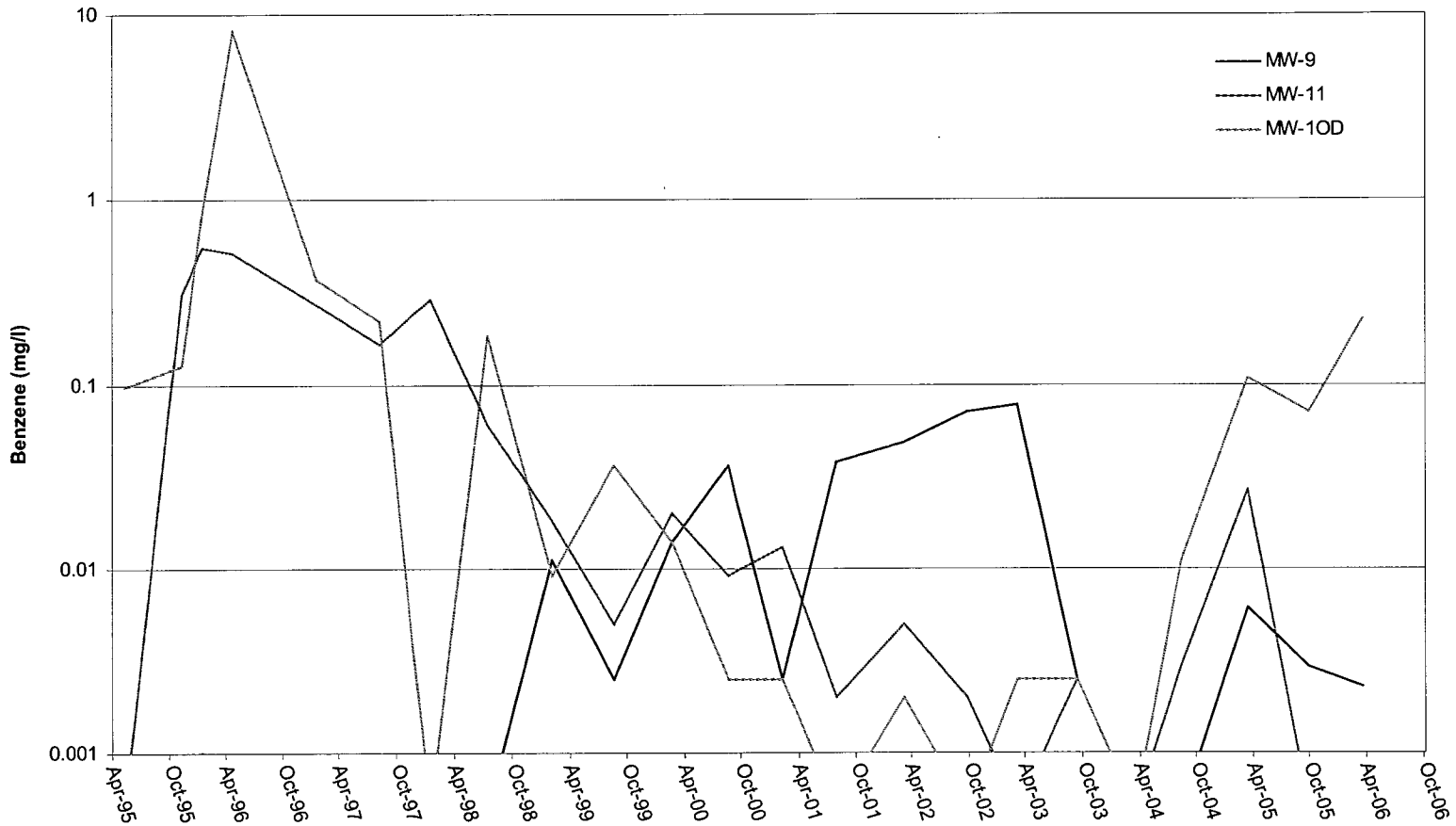


Figure 9 – BTEX Concentrations in MW-9, MW-10D and MW-11

Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY: MHS

DATE: 6/06

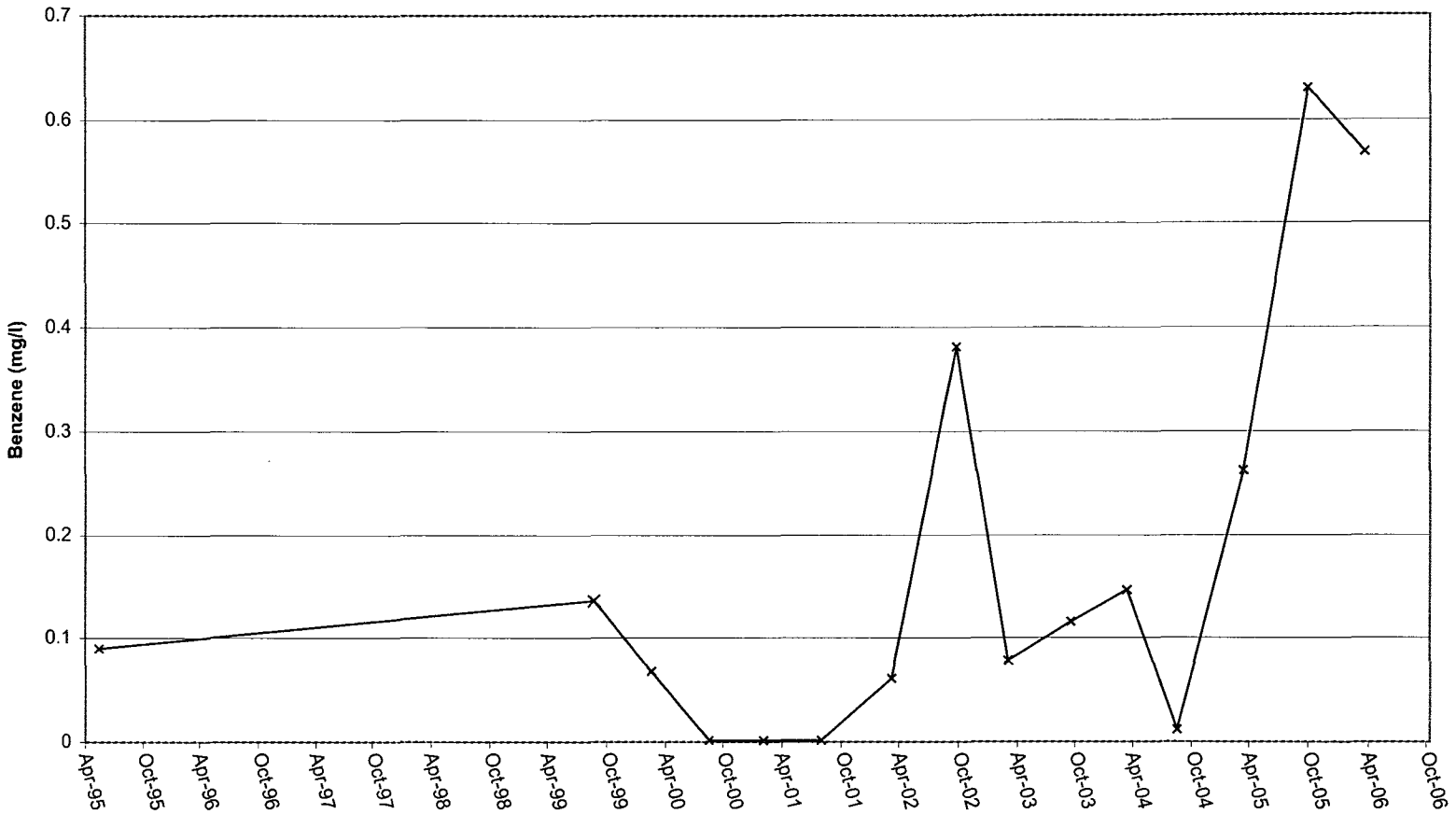


Figure 10 – BTEX Concentrations in MW-5

Linam Ranch Plant Monitoring

Duke Energy Field Services

DRAWN BY: MHS

DATE: 6/06

FIELD SAMPLING DATA AND

LABORATORY ANALYTICAL REPORT

SEPTEMBER 2005 FIELD SAMPLING DATA AND

LABORATORY ANALYTICAL REPORT

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 54.20 Feet
DEPTH TO WATER: 35.35 Feet
HEIGHT OF WATER COLUMN: 18.85 Feet
WELL DIAMETER: 2.0 Inch

9.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
7:59	0	-	-	-	-	-	Began Hand Bailing!
8:05	3.3	14.6	1.48	7.1	-	-	
8:12	6.7	14.3	1.75	7.1	-	-	
8:19	10.0	14.3	1.94	7.1	-	-	
8:25	13.3	14.4	2.05	7.1	-	-	
0:26	:Total Time (hr:min)		**13.3**	:Total Vol (gal)		**0.51**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 0830

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 50.50 Feet
DEPTH TO WATER: 39.02 Feet
HEIGHT OF WATER COLUMN: 11.48 Feet
WELL DIAMETER: 2.0 Inch

5.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
11:15	0	-	-	-	-	-	Began Hand Bailing!
11:19	2	18.1	0.41	8.2	-	-	
11:24	4	17.8	0.35	8.0	-	-	
11:29	6	17.9	0.35	7.9	-	-	
0:14	:Total Time (hr:min)		**6**	:Total Vol (gal)		**0.43**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1135

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 55.30 Feet
DEPTH TO WATER: 46.18 Feet
HEIGHT OF WATER COLUMN: 9.12 Feet
WELL DIAMETER: 2.0 Inch

4.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
8:47	0	-	-	-	-	-	Began Hand Bailing!
8:53	1.7	13.0	0.50	7.8	-	-	
8:57	3.3	15.1	0.43	7.9	-	-	
9:01	5.0	15.4	0.40	7.9	-	-	
0:14	:Total Time (hr:min)		**5**	:Total Vol (gal)		**0.36**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 0905

ANALYSES: BTEX (8021-B)

COMMENTS: Collected MS/MSD Samples

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.20 Feet
DEPTH TO WATER: 42.95 Feet
HEIGHT OF WATER COLUMN: 12.25 Feet
WELL DIAMETER: 4.0 Inch

24.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
12:40	0	-	-	-	-	-	Began Hand Bailing!
12:49	9	20.7	2.35	6.9	-	-	
13:02	18	20.8	2.40	6.9	-	-	
13:13	26	20.8	2.45	7.0	-	-	
0:33	:Total Time (hr:min)		**26**	:Total Vol (gal)		**0.79**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1320

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 62.50 Feet
DEPTH TO WATER: 57.48 Feet
HEIGHT OF WATER COLUMN: 5.02 Feet
WELL DIAMETER: 2.0 Inch

2.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
10:50	0	-	-	-	-	-	Began Hand Bailing!
10:53	1	17.3	1.15	7.5	-	-	
11:00	1.8	18.8	1.14	7.6	-	-	Well Bailed Dry!
12:37	2.5	20.6	1.09	7.6	-	-	
1:47	:Total Time (hr:min)		**2.5**	:Total Vol (gal)		**0.02**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1245

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 58.30 Feet
DEPTH TO WATER: 39.17 Feet
HEIGHT OF WATER COLUMN: 19.13 Feet
WELL DIAMETER: 4.0 Inch

37.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
11:46	0	-	-	-	-	-	Began Hand Bailing!
11:57	13	19.8	0.51	7.8	-	-	
12:08	26	18.8	0.48	7.7	-	-	
12:18	39	18.8	0.48	7.7	-	-	
0:32	:Total Time (hr:min)		**39**	:Total Vol (gal)		**1.21**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1220

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 59.10 Feet
DEPTH TO WATER: 48.82 Feet
HEIGHT OF WATER COLUMN: 10.28 Feet
WELL DIAMETER: 2.0 Inch

5.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:26	0	-	-	-	-	-	Began Hand Bailing!
9:30	2	14.3	1.20	7.2	-	-	
9:34	4	15.9	1.24	7.1	-	-	
9:39	6	16.1	1.24	7.1	-	-	
0:13	:Total Time (hr:min)		**6**	:Total Vol (gal)		**0.46**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 0940

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 65.00 Feet
DEPTH TO WATER: 48.55 Feet
HEIGHT OF WATER COLUMN: 16.45 Feet
WELL DIAMETER: 4.0 Inch

32.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:25	0	-	-	-	-	-	Began Hand Bailing!
9:37	11	19.6	1.55	7.0	-	-	
9:55	22	19.6	1.58	7.0	-	-	
10:23	33	19.3	1.57	7.0	-	-	
0:58	:Total Time (hr:min)		**33**	:Total Vol (gal)		**0.57**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1025

ANALYSES: BTEX (8021-B)

COMMENTS: Collected Duplicate Sample No.: 0509291400 for BTEX (8021-B)

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10d**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 79.00 Feet
DEPTH TO WATER: 49.51 Feet
HEIGHT OF WATER COLUMN: 29.49 Feet
WELL DIAMETER: 2.0 Inch

14.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:52	0	-	-	-	-	-	Began Hand Bailing!
10:03	5	15.6	1.40	7.3	-	-	
10:15	10	16.6	1.39	7.2	-	-	
10:27	15	17.2	1.37	7.2	-	-	
0:35	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.43**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1030

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 62.80 Feet
DEPTH TO WATER: 48.99 Feet
HEIGHT OF WATER COLUMN: 13.81 Feet
WELL DIAMETER: 4.0 Inch

27.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
11:48	0	-	-	-	-	-	Began Hand Bailing!
12:00	10	20.5	1.18	6.8	-	-	
12:11	19	20.6	1.18	6.8	-	-	
12:23	28	20.4	1.19	6.8	-	-	
0:35	:Total Time (hr:min)		**28**	:Total Vol (gal)		**0.80**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1230

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-12**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.30 Feet
DEPTH TO WATER: 48.38 Feet
HEIGHT OF WATER COLUMN: 9.92 Feet
WELL DIAMETER: 4.0 Inch

19.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
8:39	0	-	-	-	-	-	Began Hand Bailing!
8:47	7	19.2	0.98	6.8	-	-	
8:55	14	19.3	0.94	6.8	-	-	
9:04	21	19.4	0.94	6.9	-	-	
0:25	:Total Time (hr:min)		**21**	:Total Vol (gal)		**0.84**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 0910

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/29/2005
PROJECT NO. F-114
SAMPLER: J. Fergerson/D. Littlejohn

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 50.38 Feet
HEIGHT OF WATER COLUMN: 12.62 Feet
WELL DIAMETER: 4.0 Inch

24.7 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
10:58	0	-	-	-	-	-	Began Hand Bailing!
11:08	9	20.1	1.57	6.7	-	-	
11:20	18	20.4	1.64	6.8	-	-	
11:31	27	20.3	1.66	6.8	-	-	
0:33	:Total Time (hr:min)		**27**	:Total Vol (gal)		**0.82**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 050929 1135

ANALYSES: BTEX (8021-B)

COMMENTS: _____

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Dale Littlejohn
Trident Environmental
P.O. Box 7624
Midland, TX, 79708

Report Date: October 6, 2005

Work Order: 5100329

Project Location: Linam Ranch Plant
Project Number: F-114

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
74867	MW-1	water	2005-09-29	08:30	2005-10-01
74868	MW-3	water	2005-09-29	09:05	2005-10-01
74869	MW-12	water	2005-09-29	09:10	2005-10-01
74870	MW-9	water	2005-09-29	09:40	2005-10-01
74871	MW-10	water	2005-09-29	10:25	2005-10-01
74872	MW-10D	water	2005-09-29	10:30	2005-10-01
74873	MW-13	water	2005-09-29	11:35	2005-10-01
74874	MW-2	water	2005-09-29	11:35	2005-10-01
74875	MW-8	water	2005-09-29	12:20	2005-10-01
74876	MW-11	water	2005-09-29	12:30	2005-10-01
74877	MW-7	water	2005-09-29	12:45	2005-10-01
74878	MW-5	water	2005-09-29	13:20	2005-10-01
74879	Duplicate	water	2005-09-29	14:00	2005-10-01

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.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 74867 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.00670**	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		**0.0110**	mg/L	1	0.00100
Xylene		**0.00810**	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0789	mg/L	1	0.100	79	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0849	mg/L	1	0.100	85	63 - 119

Sample: 74868 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21710	Date Analyzed:	2005-10-03	Analyzed By:	KB
Prep Batch:	19049	Sample Preparation:	2005-10-03	Prepared By:	KB

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0855	mg/L	1	0.100	86	78.1 - 125.4
4-Bromofluorobenzene (4-BFB)		0.0781	mg/L	1	0.100	78	46.4 - 136.5

Sample: 74869 - MW-12

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0980	mg/L	1	0.100	98	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0871	mg/L	1	0.100	87	63 - 119

Sample: 74870 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.00290**	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0856	mg/L	1	0.100	86	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0917	mg/L	1	0.100	92	63 - 119

Sample: 74871 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**1.70**	mg/L	20	0.00100
Toluene		**0.398**	mg/L	20	0.00100
Ethylbenzene		**0.243**	mg/L	20	0.00100
Xylene		**0.327**	mg/L	20	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.58	mg/L	20	0.100	79	77.6 - 123
4-Bromofluorobenzene (4-BFB)		1.63	mg/L	20	0.100	82	63 - 119

Sample: 74872 - MW-10D

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.0703**	mg/L	1	0.00100

continued . . .

sample 74872 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Toluene		**0.0453**	mg/L	1	0.00100
Ethylbenzene		**0.00610**	mg/L	1	0.00100
Xylene		**0.0119**	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0836	mg/L	1	0.100	84	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0854	mg/L	1	0.100	85	63 - 119

Sample: 74873 - MW-13

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	[1]	0.0764	mg/L	1	0.100	76	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0738	mg/L	1	0.100	74	63 - 119

Sample: 74874 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0822	mg/L	1	0.100	82	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0805	mg/L	1	0.100	80	63 - 119

[1]TFT surrogate recovery outside normal limits. ICV/CCV and BFB surrogate recovery show the method to be in control.

Sample: 74875 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0790	mg/L	1	0.100	79	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0729	mg/L	1	0.100	73	63 - 119

Sample: 74876 - MW-11

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0799	mg/L	1	0.100	80	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0746	mg/L	1	0.100	75	63 - 119

Sample: 74877 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21709	Date Analyzed:	2005-10-03	Analyzed By:	MT
Prep Batch:	19048	Sample Preparation:	2005-10-03	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	[2]	0.0743	mg/L	1	0.100	74	77.6 - 123
4-Bromofluorobenzene (4-BFB)		0.0678	mg/L	1	0.100	68	63 - 119

Sample: 74878 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21777	Date Analyzed:	2005-10-05	Analyzed By:	KB
Prep Batch:	19112	Sample Preparation:	2005-10-05	Prepared By:	KB

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.630**	mg/L	10	0.00100
Toluene		<0.0100	mg/L	10	0.00100
Ethylbenzene		**0.267**	mg/L	10	0.00100
Xylene		**0.327**	mg/L	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.04	mg/L	10	0.100	104	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.893	mg/L	10	0.100	89	70.6 - 129.2

Sample: 74879 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	21777	Date Analyzed:	2005-10-05	Analyzed By:	KB
Prep Batch:	19112	Sample Preparation:	2005-10-05	Prepared By:	KB

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**1.63**	mg/L	20	0.00100
Toluene		**0.376**	mg/L	20	0.00100
Ethylbenzene		**0.232**	mg/L	20	0.00100
Xylene		**0.379**	mg/L	20	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.06	mg/L	20	0.100	103	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)	[3]	16.5	mg/L	20	0.100	825	70.6 - 129.2

Method Blank (1) QC Batch: 21709

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000338	mg/L	0.001
Toluene		<0.000299	mg/L	0.001

continued . . .

[2]TFT surrogate recovery outside normal limits. ICV/CCV and BFB surrogate recovery show the method to be in control.
[3]High surrogate recovery due to peak interference.

method blank continued . . .

Parameter	Flag	MDL Result	Units	RL
Ethylbenzene		<0.000469	mg/L	0.001
Xylene		<0.000787	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0924	mg/L	1	0.100	92	75.8 - 126
4-Bromofluorobenzene (4-BFB)		0.0867	mg/L	1	0.100	87	51.4 - 119

Method Blank (1) QC Batch: 21710

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000136	mg/L	0.001
Toluene		<0.000247	mg/L	0.001
Ethylbenzene		<0.000552	mg/L	0.001
Xylene		<0.00156	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0860	mg/L	1	0.100	86	73.8 - 121
4-Bromofluorobenzene (4-BFB)		0.0778	mg/L	1	0.100	78	52.4 - 113

Method Blank (1) QC Batch: 21777

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000650	mg/L	0.001
Toluene		<0.00101	mg/L	0.001
Ethylbenzene		<0.000840	mg/L	0.001
Xylene		<0.000737	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0978	mg/L	1	0.100	98	48.4 - 119
4-Bromofluorobenzene (4-BFB)		0.0790	mg/L	1	0.100	79	17.1 - 138

Laboratory Control Spike (LCS-1)

QC Batch: 21709 Date Analyzed: 2005-10-03 Analyzed By: MT
Prep Batch: 19048 QC Preparation: 2005-10-03 Prepared By: MT

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0935	0.0942	mg/L	1	0.100	<0.000338	94	1	79.2 - 122	8.8
Toluene	0.0925	0.0931	mg/L	1	0.100	<0.000299	92	1	76.2 - 116	9.4

continued . . .

control spikes continued . . .

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Ethylbenzene	0.0917	0.0923	mg/L	1	0.100	<0.000469	92	1	73.2 - 116	8.5
Xylene	0.275	0.277	mg/L	1	0.300	<0.000787	92	1	72.5 - 116	8.4

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0903	0.0917	mg/L	1	0.100	90	92	77.6 - 123
4-Bromofluorobenzene (4-BFB)	0.0911	0.0914	mg/L	1	0.100	91	91	63 - 119

Laboratory Control Spike (LCS-1)

QC Batch: 21710 Date Analyzed: 2005-10-03 Analyzed By: KB
Prep Batch: 19049 QC Preparation: 2005-10-03 Prepared By: KB

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0915	0.0914	mg/L	1	0.100	<0.000136	92	0	85.2 - 109	20
Toluene	0.0914	0.0916	mg/L	1	0.100	<0.000247	91	0	80.8 - 107.3	20
Ethylbenzene	0.0887	0.0895	mg/L	1	0.100	<0.000550	89	1	86.4 - 115.3	20
Xylene	0.270	0.271	mg/L	1	0.300	<0.00156	90	0	95 - 122.3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0880	0.0885	mg/L	1	0.100	88	88	72.9 - 121
4-Bromofluorobenzene (4-BFB)	0.0924	0.0924	mg/L	1	0.100	92	92	77.8 - 119

Laboratory Control Spike (LCS-1)

QC Batch: 21777 Date Analyzed: 2005-10-05 Analyzed By: KB
Prep Batch: 19112 QC Preparation: 2005-10-05 Prepared By: KB

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0945	0.0949	mg/L	1	0.100	<0.000650	94	0	80.8 - 120.7	20
Toluene	0.0944	0.0952	mg/L	1	0.100	<0.00101	94	1	81 - 120.8	20
Ethylbenzene	0.0988	0.0994	mg/L	1	0.100	<0.000840	99	1	82.1 - 121	20
Xylene	0.298	0.299	mg/L	1	0.300	<0.000737	99	0	82.4 - 123.3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.102	0.103	mg/L	1	0.100	102	103	48.4 - 119
4-Bromofluorobenzene (4-BFB)	0.0824	0.0823	mg/L	1	0.100	82	82	17.1 - 138

Matrix Spike (MS-1)

QC Batch: 21709 Date Analyzed: 2005-10-03 Analyzed By: MT
Prep Batch: 19048 QC Preparation: 2005-10-03 Prepared By: MT

Param		MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	[4]	0.0957	NA	mg/L	1	0.100	<0.000338	96	200	84.6 - 117	20
Toluene	[5]	0.0940	NA	mg/L	1	0.100	<0.000299	94	200	80.9 - 115	20
Ethylbenzene	[6]	0.0927	NA	mg/L	1	0.100	<0.000469	93	200	77.6 - 119	20
Xylene	[7]	0.271	NA	mg/L	1	0.300	<0.000787	90	200	76.2 - 122	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate		MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	[8]	0.0950	NA	mg/L	1	0.1	95	0	79.7 - 119
4-Bromofluorobenzene (4-BFB)	[9]	0.0924	NA	mg/L	1	0.1	92	0	65.6 - 141

Matrix Spike (MS-1)

QC Batch: 21710 Date Analyzed: 2005-10-03 Analyzed By: KB
Prep Batch: 19049 QC Preparation: 2005-10-03 Prepared By: KB

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.102	0.101	mg/L	1	0.100	<0.000136	102	1	72.8 - 130	20
Toluene	0.102	0.101	mg/L	1	0.100	<0.000247	102	1	70 - 130	20
Ethylbenzene	0.0997	0.0991	mg/L	1	0.100	<0.000550	100	1	75.1 - 130	20
Xylene	0.299	0.298	mg/L	1	0.300	<0.00156	100	0	77 - 131.9	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0876	0.0882	mg/L	1	0.1	88	88	70 - 130
4-Bromofluorobenzene (4-BFB)	0.0924	0.0939	mg/L	1	0.1	92	94	70 - 130

Standard (ICV-1)

QC Batch: 21709 Date Analyzed: 2005-10-03 Analyzed By: MT

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0917	92	85 - 115	2005-10-03
Toluene		mg/L	0.100	0.0892	89	85 - 115	2005-10-03

continued ...

[4]RPD is out of range because a matrix spike duplicate was not prepared.
[5]RPD is out of range because a matrix spike duplicate was not prepared.
[6]RPD is out of range because a matrix spike duplicate was not prepared.
[7]RPD is out of range because a matrix spike duplicate was not prepared.
[8]RPD is out of range because a matrix spike duplicate was not prepared.
[9]RPD is out of range because a matrix spike duplicate was not prepared.

standard continued . . .

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Ethylbenzene		mg/L	0.100	0.0887	89	85 - 115	2005-10-03
Xylene		mg/L	0.300	0.265	88	85 - 115	2005-10-03

Standard (CCV-1)

QC Batch: 21709 Date Analyzed: 2005-10-03 Analyzed By: MT

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0920	92	85 - 115	2005-10-03
Toluene		mg/L	0.100	0.0894	89	85 - 115	2005-10-03
Ethylbenzene		mg/L	0.100	0.0893	89	85 - 115	2005-10-03
Xylene		mg/L	0.300	0.266	89	85 - 115	2005-10-03

Standard (ICV-1)

QC Batch: 21710 Date Analyzed: 2005-10-03 Analyzed By: KB

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0900	90	85 - 115	2005-10-03
Toluene		mg/L	0.100	0.0915	92	85 - 115	2005-10-03
Ethylbenzene		mg/L	0.100	0.0887	89	85 - 115	2005-10-03
Xylene		mg/L	0.300	0.272	91	85 - 115	2005-10-03

Standard (CCV-1)

QC Batch: 21710 Date Analyzed: 2005-10-03 Analyzed By: KB

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0889	89	85 - 115	2005-10-03
Toluene		mg/L	0.100	0.0903	90	85 - 115	2005-10-03
Ethylbenzene		mg/L	0.100	0.0872	87	85 - 115	2005-10-03
Xylene		mg/L	0.300	0.266	89	85 - 115	2005-10-03

Standard (ICV-1)

QC Batch: 21777 Date Analyzed: 2005-10-05 Analyzed By: KB

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0927	93	85 - 115	2005-10-05

continued . . .

standard continued . . .

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Toluene		mg/L	0.100	0.0934	93	85 - 115	2005-10-05
Ethylbenzene		mg/L	0.100	0.0979	98	85 - 115	2005-10-05
Xylene		mg/L	0.300	0.294	98	85 - 115	2005-10-05

Standard (CCV-1)

QC Batch: 21777 Date Analyzed: 2005-10-05 Analyzed By: KB

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0936	94	85 - 115	2005-10-05
Toluene		mg/L	0.100	0.0931	93	85 - 115	2005-10-05
Ethylbenzene		mg/L	0.100	0.0968	97	85 - 115	2005-10-05
Xylene		mg/L	0.300	0.292	97	85 - 115	2005-10-05

5100329

TRIDENT ENVIRONMENTAL
American Environmental Consult
6885 S Marshall St., Ste. 3
Littleton, CO 80128
Phone: (303) 948-7733
Fax: (303) 948-7793

F-114-0509

Chain of Custody

Date 9/30/05 Page 1 of 2

Lab Name: Trace Analysis, Inc.
Address: 6701 Aberdeen Avenue
Lubbock, Texas 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES)
Dale T Littlejohn

Analysis Request

	Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals							Number of Containers
74867	MW-1	Water	9/29/05	0830	G	✓																				2
68	MW-3 (MS/MSD)	Water	9/29/05	0905	G	✓																				6
69	MW-12	Water	9/29/05	0910	G	✓																				2
70	MW-9	Water	9/29/05	0940	G	✓																				2
71	MW-10	Water	9/29/05	1025	G	✓																				2
72	MW-10d	Water	9/29/05	1030	G	✓																				2
73	MW-13	Water	9/29/05	1135	G	✓																				2
74	MW-2	Water	9/29/05	1135	G	✓																				2
75	MW-8	Water	9/29/05	1220	G	✓																				2
76	MW-11	Water	9/29/05	1230	G	✓																				2

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Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	John Fergerson	Rec'd Good Cond/Cold:	
Cost Center No.:	F-114	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments:
Fax copy of lab report to Michael Stewart, sent lab report/invoice to Daniel Dick, Duke Energy Field Services, 303 17th St., Ste 2500, Denver, CO 80202

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Company) Trident Environmental	(Company) TRACE ANALYSIS	(Company)
(Printed Name) Dale T. Littlejohn	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) Dale T Littlejohn	(Signature) Helen Shelton	(Signature)
(Date) 9/30/05 (Time) 2:25	(Date) 9/30/05 (Time) 1730	(Date) (Time)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Company) TRACE ANALYSIS	(Company) Trace Analysis	(Company)
(Printed Name) HELEN SHELTON	(Printed Name) Michael Turner	(Printed Name)
(Signature) Helen Shelton	(Signature) [illegible]	(Signature)
(Date) 9/30/05 (Time) 2:25	(Date) 10/1/05 (Time) 9:05	(Date) (Time)

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GreyHound GLI 1683197780

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TRIDENT ENVIRONMENTAL

American Environmental Consult
6885 S Marshall St., Ste. 3
Littleton, CO 80128
Phone: (303) 948-7733
Fax: (303) 948-7793

F-114-0509

Chain of Custody

Date 9/30/05 Page 2 of 2

Lab Name: Trace Analysis, Inc.
Address: 6701 Aberdeen Avenue
Lubbock, Texas 79424
Telephone: (800) 378-1296

Samplers (SIGNATURES): Dale T Littlejohn

Analysis Request

	Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals							Number of Containers
74877	MW-7	Water	9/29/05	1245	G	✓																				2
78	MW-5	Water	9/29/05	1320	G	✓																				2
79	Duplicate	Water	9/29/05	1400	G	✓																				2

(6)

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	John Fergerson	Rec'd Good Cond/Cold:	
Cost Center No.:	F-114	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments:
Fax copy of lab report to Michael Stewart, sent lab report/invoce to Daniel Dick, Duke Energy Field Services, 303 17th St., Ste 2500, Denver, CO 80202

	Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Company)	Trident Environmental	TRACE ANALYSIS	
(Printed Name)	Dale T. Littlejohn	HELEN SHELTON	
(Signature)	Dale T Littlejohn	Helen Shelton	
(Date) / (Time)	9/30/05 2:25	9/30/05 17:00	
	Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Company)	TRACE ANALYSIS	Trace Analysis	
(Printed Name)	HELEN SHELTON	Michael Turner	
(Signature)	Helen Shelton	[illegible]	
(Date) / (Time)	9/30/05 2:25	10/1/05 9:05	

Copy signed original form for Trident Environmental records

MA Greyhound GLI 168 397780

MARCH 2006 FIELD SAMPLING DATA AND

LABORATORY ANALYTICAL REPORT

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 54.20 Feet
DEPTH TO WATER: 36.10 Feet
HEIGHT OF WATER COLUMN: 18.10 Feet
WELL DIAMETER: 2.0 Inch

8.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:56	0.0	-	-	-	-	-	Began Hand Bailing!
10:02	3.0	17.7	1.52	6.98	-	-	
10:09	6.0	17.3	2.25	6.97	-	-	
10:17	9.0	17.1	2.39	6.98	-	-	
0:21	:Total Time (hr:min)		**9**	:Total Vol (gal)		**0.43**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1020

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 50.50 Feet
DEPTH TO WATER: 41.20 Feet
HEIGHT OF WATER COLUMN: 9.30 Feet
WELL DIAMETER: 2.0 Inch

4.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
10:39	0.0	-	-	-	-	-	Began Hand Bailing!
10:42	1.7	17.0	0.35	7.53	-	-	
10:47	3.4	17.2	0.35	7.56	-	-	
10:52	5.1	17.2	0.33	7.57	-	-	
0:13	:Total Time (hr:min)		**5.1**	:Total Vol (gal)		**0.39**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1055

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 55.30 Feet
DEPTH TO WATER: 46.07 Feet
HEIGHT OF WATER COLUMN: 9.23 Feet
WELL DIAMETER: 2.0 Inch

4.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
12:20	0.0	-	-	-	-	-	Began Hand Bailing!
12:24	1.7	18.1	0.36	7.63	-	-	
12:29	3.4	18.3	0.35	7.65	-	-	
12:34	5.1	18.3	0.35	7.63	-	-	
0:14	:Total Time (hr:min)		**5.1**	:Total Vol (gal)		**0.36**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1240

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.20 Feet
DEPTH TO WATER: 42.94 Feet
HEIGHT OF WATER COLUMN: 12.26 Feet
WELL DIAMETER: 4.0 Inch

24.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
10:13	0	-	-	-	-	-	Began Hand Bailing!
10:21	8	20.1	2.15	6.88	-	-	
10:34	16	19.8	2.36	7.01	-	-	
10:46	25	19.7	2.36	6.97	-	-	
0:33	:Total Time (hr:min)		**25**	:Total Vol (gal)		**0.76**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060323 1050

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 62.50 Feet
DEPTH TO WATER: 56.98 Feet
HEIGHT OF WATER COLUMN: 5.52 Feet
WELL DIAMETER: 2.0 Inch

2.7 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:22	0.0	-	-	-	-	-	Began Hand Bailing!
9:24	0.9	18.5	0.98	7.16	-	-	
9:29	1.8	18.1	0.99	7.19	-	-	
9:38	2.7	18.2	1.00	7.25	-	-	
0:16	:Total Time (hr:min)		**2.7**	:Total Vol (gal)		**0.17**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 0940

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 58.30 Feet
DEPTH TO WATER: 40.47 Feet
HEIGHT OF WATER COLUMN: 17.83 Feet
WELL DIAMETER: 4.0 Inch

34.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
11:22	0.0	-	-	-	-	-	Began Hand Bailing!
11:32	12	16.7	0.99	7.18	-	-	
11:44	24	16.1	1.08	7.20	-	-	
11:57	36	16.4	1.16	7.19	-	-	
0:35	:Total Time (hr:min)		**36**	:Total Vol (gal)		**1.03**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1200

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 59.10 Feet
DEPTH TO WATER: 48.48 Feet
HEIGHT OF WATER COLUMN: 10.62 Feet
WELL DIAMETER: 2.0 Inch

5.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
12:52	0	-	-	-	-	-	Began Hand Bailing!
12:55	1.7	18.5	1.09	6.94	-	-	
13:02	3.4	18.5	1.11	6.94	-	-	
13:07	5.1	18.5	1.12	6.94	-	-	
0:15	:Total Time (hr:min)		**5.1**	:Total Vol (gal)		**0.34**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1310

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 65.00 Feet
DEPTH TO WATER: 48.21 Feet
HEIGHT OF WATER COLUMN: 16.79 Feet
WELL DIAMETER: 4.0 Inch

32.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
15:36	0	-	-	-	-	-	Began Hand Bailing!
15:48	11	18.9	1.52	7.20	-	-	
16:04	22	18.5	1.54	7.35	-	-	
16:19	33	18.3	1.54	7.37	-	-	
0:43	:Total Time (hr:min)		**33**	:Total Vol (gal)		**0.76**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1625

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10d**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 79.00 Feet
DEPTH TO WATER: 49.49 Feet
HEIGHT OF WATER COLUMN: 29.51 Feet
WELL DIAMETER: 2.0 Inch

14.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
14:35	0	-	-	-	-	-	Began Hand Bailing!
14:49	5.1	18.6	1.26	7.18	-	-	
15:04	10.2	18.6	1.23	7.19	-	-	
15:19	15.3	18.5	1.20	7.16	-	-	
0:44	:Total Time (hr:min)		**15.3**	:Total Vol (gal)		**0.35**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1525

ANALYSES: BTEX (8021-B)

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 62.80 Feet
DEPTH TO WATER: 48.85 Feet
HEIGHT OF WATER COLUMN: 13.95 Feet
WELL DIAMETER: 4.0 Inch

27.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
9:24	0	-	-	-	-	-	Began Hand Bailing!
9:34	9	18.5	1.21	6.89	-	-	
9:46	18	18.1	1.19	6.97	-	-	
9:59	28	18.0	1.20	6.91	-	-	
0:35	:Total Time (hr:min)		**28**	:Total Vol (gal)		**0.80**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060323 1005

ANALYSES: BTEX (8021-B)

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-12**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.30 Feet
DEPTH TO WATER: 48.20 Feet
HEIGHT OF WATER COLUMN: 10.10 Feet
WELL DIAMETER: 4.0 Inch

19.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
16:40	0	-	-	-	-	-	Began Hand Bailing!
16:46	7	18.0	1.02	7.01	-	-	
16:56	14	17.8	1.12	7.03	-	-	
17:05	21	17.7	1.13	7.01	-	-	
0:25	:Total Time (hr:min)		**21**	:Total Vol (gal)		**0.84**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060322 1710

ANALYSES: BTEX (8021-B)

COMMENTS: Collected Duplicate Sample No.: 0603221800 for BTEX (8021-B)

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/22/2006
PROJECT NO. F-114
SAMPLER: J. Fergerson

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☐ Alconox ☐ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility

TOTAL DEPTH OF WELL: 63.00 Feet
DEPTH TO WATER: 50.43 Feet
HEIGHT OF WATER COLUMN: 12.57 Feet
WELL DIAMETER: 4.0 Inch

24.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO mg\L	Turb	PHYSICAL APPEARANCE AND REMARKS
8:37	0	-	-	-	-	-	Began Hand Bailing!
8:46	9	18.4	1.50	6.89	-	-	
8:57	18	18.4	1.58	6.89	-	-	
9:09	27	18.2	1.60	6.87	-	-	
0:32	:Total Time (hr:min)		**27**	:Total Vol (gal)		**0.84**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 060323 0915

ANALYSES: BTEX (8021-B)

COMMENTS:

Analytical and Quality Control Report

Mike Stewart
American Environmental Consulting
6885 South Marshall Street
Suite 3
Littleton, CO, 80128

Report Date: March 28, 2006

Work Order: 6032419

Project Location: Linam Ranch Gas Plant
Project Name: DEFS
Project Number: Linam Ranch Gas Plant

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
86740	MW-7 (0603220940)	water	2006-03-22	09:40	2006-03-24
86741	MW-1 (0603221020)	water	2006-03-22	10:20	2006-03-24
86742	MW-2 (0603221055)	water	2006-03-22	10:55	2006-03-24
86743	MW-8 (0603221200)	water	2006-03-22	12:00	2006-03-24
86744	MW-3 (0603221240)	water	2006-03-22	12:40	2006-03-24
86745	MW-9 (0603221310)	water	2006-03-22	13:10	2006-03-24
86746	MW-10d (0603221525)	water	2006-03-22	15:25	2006-03-24
86747	MW-10 (0603221625)	water	2006-03-22	16:25	2006-03-24
86748	MW-12 (0603221710)	water	2006-03-22	17:10	2006-03-24
86749	Duplicate (0603221800)	water	2006-03-22	18:00	2006-03-24
86750	MW-13 (0603230915)	water	2006-03-23	09:15	2006-03-24
86751	MW-11 (0603231005)	water	2006-03-23	10:05	2006-03-24
86752	MW-5 (0603231050)	water	2006-03-23	10:50	2006-03-24
86753	Trip Blank	water	2006-03-23	00:00	2006-03-24

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 13 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Michael Abel

Dr. Blair Leftwich, Director

Analytical Report

Sample: 86740 - MW-7 (0603220940)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25473	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22368	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0861	mg/L	1	0.100	86	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0732	mg/L	1	0.100	73	70.6 - 129.2

Sample: 86741 - MW-1 (0603221020)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.00280**	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		**0.00130**	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0862	mg/L	1	0.100	86	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0971	mg/L	1	0.100	97	70.6 - 129.2

Sample: 86742 - MW-2 (0603221055)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0889	mg/L	1	0.100	89	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0753	mg/L	1	0.100	75	70.6 - 129.2

Sample: 86743 - MW-8 (0603221200)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0869	mg/L	1	0.100	87	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0736	mg/L	1	0.100	74	70.6 - 129.2

Sample: 86744 - MW-3 (0603221240)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0879	mg/L	1	0.100	88	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0710	mg/L	1	0.100	71	70.6 - 129.2

Sample: 86745 - MW-9 (0603221310)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.00230**	mg/L	1	0.00100

continued . . .

sample 86745 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0834	mg/L	1	0.100	83	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0839	mg/L	1	0.100	84	70.6 - 129.2

Sample: 86746 - MW-10d (0603221525)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.224**	mg/L	1	0.00100
Toluene		**0.0614**	mg/L	1	0.00100
Ethylbenzene		**0.0295**	mg/L	1	0.00100
Xylene		**0.0267**	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0806	mg/L	1	0.100	81	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.122	mg/L	1	0.100	122	70.6 - 129.2

Sample: 86747 - MW-10 (0603221625)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25486	Date Analyzed:	2006-03-26	Analyzed By:	MT
Prep Batch:	22375	Sample Preparation:	2006-03-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**1.48**	mg/L	20	0.00100
Toluene		**0.254**	mg/L	20	0.00100
Ethylbenzene		**0.241**	mg/L	20	0.00100
Xylene		**0.304**	mg/L	20	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		2.24	mg/L	20	0.100	112	78.1 - 125.4
4-Bromofluorobenzene (4-BFB)	[1]	2.85	mg/L	20	0.100	142	46.4 - 136.5

[1] High surrogate recovery due to peak interference.

Sample: 86748 - MW-12 (0603221710)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25486	Date Analyzed:	2006-03-26	Analyzed By:	MT
Prep Batch:	22375	Sample Preparation:	2006-03-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.458	mg/L	5	0.100	92	78.1 - 125.4
4-Bromofluorobenzene (4-BFB)		0.445	mg/L	5	0.100	89	46.4 - 136.5

Sample: 86749 - Duplicate (0603221800)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0824	mg/L	1	0.100	82	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)	2	0.0682	mg/L	1	0.100	68	70.6 - 129.2

Sample: 86750 - MW-13 (0603230915)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

[2]BFB surrogate recovery outside normal limits. TFT surrogate recovery and the ICV/CCV show the method to be in control.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0834	mg/L	1	0.100	83	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)	3	0.0682	mg/L	1	0.100	68	70.6 - 129.2

Sample: 86751 - MW-11 (0603231005)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0849	mg/L	1	0.100	85	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)	4	0.0686	mg/L	1	0.100	69	70.6 - 129.2

Sample: 86752 - MW-5 (0603231050)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25486	Date Analyzed:	2006-03-26	Analyzed By:	MT
Prep Batch:	22375	Sample Preparation:	2006-03-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		**0.569**	mg/L	10	0.00100
Toluene		<0.0100	mg/L	10	0.00100
Ethylbenzene		**0.239**	mg/L	10	0.00100
Xylene		**0.296**	mg/L	10	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		1.02	mg/L	10	0.100	102	78.1 - 125.4
4-Bromofluorobenzene (4-BFB)		0.963	mg/L	10	0.100	96	46.4 - 136.5

Sample: 86753 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	25472	Date Analyzed:	2006-03-24	Analyzed By:	MT
Prep Batch:	22367	Sample Preparation:	2006-03-24	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100

[3]BFB surrogate recovery outside normal limits. TFT surrogate recovery and the ICV/CCV show the method to be in control.
[4]BFB surrogate recovery outside normal limits. TFT surrogate recovery and the ICV/CCV show the method to be in control.

continued . . .

sample 86753 continued . . .

Parameter	Flag	RL Result	Units	Dilution	RL
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0869	mg/L	1	0.100	87	66.2 - 127.7
4-Bromofluorobenzene (4-BFB)		0.0763	mg/L	1	0.100	76	70.6 - 129.2

Method Blank (1) QC Batch: 25472

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000255	mg/L	0.001
Toluene		<0.000210	mg/L	0.001
Ethylbenzene		<0.000317	mg/L	0.001
Xylene		<0.000603	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0899	mg/L	1	0.100	90	76.1 - 117
4-Bromofluorobenzene (4-BFB)		0.0790	mg/L	1	0.100	79	58.5 - 118

Method Blank (1) QC Batch: 25473

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000255	mg/L	0.001
Toluene		<0.000210	mg/L	0.001
Ethylbenzene		<0.000317	mg/L	0.001
Xylene		<0.000603	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0866	mg/L	1	0.100	87	76.1 - 117
4-Bromofluorobenzene (4-BFB)		0.0699	mg/L	1	0.100	70	58.5 - 118

Method Blank (1) QC Batch: 25486

Parameter	Flag	MDL Result	Units	RL
Benzene		<0.000153	mg/L	0.001
Toluene		<0.000283	mg/L	0.001
Ethylbenzene		<0.000621	mg/L	0.001
Xylene		<0.000456	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0925	mg/L	1	0.100	92	85.1 - 106
4-Bromofluorobenzene (4-BFB)		0.0901	mg/L	1	0.100	90	64.7 - 117

Laboratory Control Spike (LCS-1) QC Batch: 25472

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0950	0.0921	mg/L	1	0.100	<0.000255	95	3	80.8 - 112	20
Toluene	0.0944	0.0922	mg/L	1	0.100	<0.000210	94	2	78 - 114	20
Ethylbenzene	0.0971	0.0951	mg/L	1	0.100	<0.000317	97	2	78.6 - 116	20
Xylene	0.287	0.282	mg/L	1	0.300	<0.000603	96	2	83.2 - 112	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0910	0.0872	mg/L	1	0.100	91	87	79.9 - 117
4-Bromofluorobenzene (4-BFB)	0.0956	0.0932	mg/L	1	0.100	96	93	79 - 123

Laboratory Control Spike (LCS-1) QC Batch: 25473

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0941	0.0939	mg/L	1	0.100	<0.000255	94	0	80.8 - 112	20
Toluene	0.0927	0.0929	mg/L	1	0.100	<0.000210	93	0	78 - 114	20
Ethylbenzene	0.0930	0.0938	mg/L	1	0.100	<0.000317	93	1	78.6 - 116	20
Xylene	0.282	0.285	mg/L	1	0.300	<0.000603	94	1	83.2 - 112	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0868	0.0859	mg/L	1	0.100	87	86	79.9 - 117
4-Bromofluorobenzene (4-BFB)	0.0896	0.0894	mg/L	1	0.100	90	89	79 - 123

Laboratory Control Spike (LCS-1) QC Batch: 25486

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.101	0.101	mg/L	1	0.100	<0.000153	101	0	80 - 120	20
Toluene	0.102	0.101	mg/L	1	0.100	<0.000283	102	1	80 - 120	20
Ethylbenzene	0.101	0.101	mg/L	1	0.100	<0.000621	101	0	80 - 120	20
Xylene	0.300	0.299	mg/L	1	0.300	<0.000456	100	0	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

continued ...

control spikes continued . . .

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0999	0.0988	mg/L	1	0.100	100	99	80 - 120
4-Bromofluorobenzene (4-BFB)	0.0973	0.0962	mg/L	1	0.100	97	96	80 - 120

Matrix Spike (MS-1) QC Batch: 25472 Spiked Sample: 86742

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0960	0.0898	mg/L	1	0.100	<0.000255	96	7	70.9 - 126	20
Toluene	0.0951	0.0896	mg/L	1	0.100	<0.000210	95	6	70.8 - 125	20
Ethylbenzene	0.0947	0.0897	mg/L	1	0.100	<0.000317	95	5	74.8 - 125	20
Xylene	0.285	0.270	mg/L	1	0.300	<0.000603	95	5	75.7 - 126	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0880	0.0877	mg/L	1	0.1	88	88	73.6 - 121
4-Bromofluorobenzene (4-BFB)	0.0933	0.0918	mg/L	1	0.1	93	92	81.8 - 114

Matrix Spike (MS-1) QC Batch: 25473 Spiked Sample: 86740

Param		MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	[5]	0.0953	NA	mg/L	1	0.100	<0.000255	95	200	70.9 - 126	20
Toluene	[6]	0.0941	NA	mg/L	1	0.100	<0.000210	94	200	70.8 - 125	20
Ethylbenzene	[7]	0.0947	NA	mg/L	1	0.100	<0.000317	95	200	74.8 - 125	20
Xylene	[8]	0.287	NA	mg/L	1	0.300	<0.000603	96	200	75.7 - 126	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate		MS Result	MSD Result	Units	Dil.	Spike Amount	MS Rec.	MSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	[9]	0.0870	NA	mg/L	1	0.1	87	0	73.6 - 121
4-Bromofluorobenzene (4-BFB)	[10]	0.0913	NA	mg/L	1	0.1	91	0	81.8 - 114

Standard (ICV-1) QC Batch: 25472

[5]RPD is out of range because a matrix spike duplicate was not prepared.
[6]RPD is out of range because a matrix spike duplicate was not prepared.
[7]RPD is out of range because a matrix spike duplicate was not prepared.
[8]RPD is out of range because a matrix spike duplicate was not prepared.
[9]RPD is out of range because a matrix spike duplicate was not prepared.
[10]RPD is out of range because a matrix spike duplicate was not prepared.

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0918	92	85 - 115	2006-03-24
Toluene		mg/L	0.100	0.0925	92	85 - 115	2006-03-24
Ethylbenzene		mg/L	0.100	0.0925	92	85 - 115	2006-03-24
Xylene		mg/L	0.300	0.279	93	85 - 115	2006-03-24

Standard (CCV-1) QC Batch: 25472

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0869	87	85 - 115	2006-03-24
Toluene		mg/L	0.100	0.0864	86	85 - 115	2006-03-24
Ethylbenzene		mg/L	0.100	0.0873	87	85 - 115	2006-03-24
Xylene		mg/L	0.300	0.263	88	85 - 115	2006-03-24

Standard (ICV-1) QC Batch: 25473

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0907	91	85 - 115	2006-03-24
Toluene		mg/L	0.100	0.0898	90	85 - 115	2006-03-24
Ethylbenzene		mg/L	0.100	0.0903	90	85 - 115	2006-03-24
Xylene		mg/L	0.300	0.275	92	85 - 115	2006-03-24

Standard (CCV-1) QC Batch: 25473

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0932	93	85 - 115	2006-03-24
Toluene		mg/L	0.100	0.0917	92	85 - 115	2006-03-24
Ethylbenzene		mg/L	0.100	0.0937	94	85 - 115	2006-03-24
Xylene		mg/L	0.300	0.283	94	85 - 115	2006-03-24

Standard (ICV-1) QC Batch: 25486

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0994	99	85 - 115	2006-03-26
Toluene		mg/L	0.100	0.100	100	85 - 115	2006-03-26
Ethylbenzene		mg/L	0.100	0.100	100	85 - 115	2006-03-26
Xylene		mg/L	0.300	0.298	99	85 - 115	2006-03-26

Standard (CCV-1) QC Batch: 25486

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0987	99	85 - 115	2006-03-26
Toluene		mg/L	0.100	0.0990	99	85 - 115	2006-03-26
Ethylbenzene		mg/L	0.100	0.0999	100	85 - 115	2006-03-26
Xylene		mg/L	0.300	0.300	100	85 - 115	2006-03-26

Page 1 of 2

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1 (800) 378-1296
email: lab@traceanalysis.com

TraceAnalysis, Inc.

1[illegible] McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 6032419

Company Name: American Environmental Consultants
Phone #: 303-948-7733
Address: (Street, City, Zip) 6885 South Marshall St, Suite 3 Littleton, CO 80128
Fax #:
e-mail: 303-948-7793
Contact Person: Mike Stewart
Invoice to: (If different from above) Duke Energy Field Services Attn: Daniel Dick
Project #:
Project Name: DEFS
Project Location: Linam Ranch Gas Plant
Sampler Signature:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE		PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE		SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	TX 1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content			MS/MSD	Turn Around Time if different from standard	Hold
86740	MW-7 (060322 0940)	2	40ml	✓					✓				✓			3/22/06	0940		✓																				
41	MW-1 (060322 1020)	2	"	✓					✓				✓			"	1020		✓																				
42	MW-2 (060322 1055)	2	"	✓					✓				✓			"	1055		✓																✓				
43	MW-8 (060322 1200)	2	"	✓					✓				✓			"	1200		✓																				
44	MW-3 (060322 1240)	2	"	✓					✓				✓			"	1240		✓																				
45	MW-9 (060322 1310)	2	"	✓					✓				✓			"	1310		✓																				
46	MW-10d (060322 1525)	2	"	✓					✓				✓			"	1525		✓																				
47	MW-10 (060322 1625)	2	"	✓					✓				✓			"	1625		✓																				
48	MW-12 (060322 1710)	2	"	✓					✓				✓			"	1710		✓																				
49	Duplicate (060322 1800)	2	"	✓					✓				✓			"	1800		✓																				
50	MW-13 (060323 0915)	2	"	✓					✓				✓			3/23/06	0915		✓																				

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	3/23/06	1710	Helena Shelton	3/23/06	1710
Helena Shelton	3/23/06	1745			
Relinquished by:	Date:	Time:	Received at Laboratory by: Megan Mcclard	Date: 3/24/06	Time: 1035

LAB USE ONLY
Intact (Y) N
Headspace Y (N)
Temp 4°
Log-in Review [illegible]

REMARKS:
- ☐ Dry Weight Basis Required
- ☐ TRRP Report Required
- ☐ Check If Special Reporting Limits Are Needed

Carrier # Lone Star P1827774

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C. 26-115

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1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # 6032419

Company Name: American Environmental Consultants
Phone #: 303-948-7733
Address: (Street, City, Zip) 6885 South Marshall St, Suite 3 Littleton, CO 80128
Fax #:
e-mail: 303-948-7793
Contact Person: Mike Stewart
Invoice to: (If different from above) Duke Energy Field Services Attn: Daniel Dick
Project #:
Project Name: DEFS
Project Location: Linam Ranch Gas Plant
Sampler Signature:

ANALYSIS REQUEST
(Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	TX 1005 Extended (C35)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260B/624	GC/MS Semi. Vol. 8270C/625	PCB's 8082/608	Pesticides 8081A/608	BOD, TSS, pH	Moisture Content				Turn Around Time if different from standard	Hold
86751	MW-11 (060323 1005)	40ml	2	✓				✓				✓		3/23/06	1005		✓																				
52	MW-5 (060323 1050)	"	2	✓				✓				✓		"	1050		✓																				
53	Trip Blank	"	2	✓				✓				✓					✓																				

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	3/23/06	1710	Ellen Shelton	3/23/06	1710
Ellen Shelton	3/23/06	1745			
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
			Megan McCord	3/24/06	1035

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

ORIGINAL COPY

LAB USE ONLY
Intact (Y) N
Headspace Y (N)
Temp ___ °
Log-in Review DB

REMARKS:

☐ Dry Weight Basis Required
☐ TRRP Report Required
☐ Check If Special Reporting Limits Are Needed

Carrier # Lone Star P1827774

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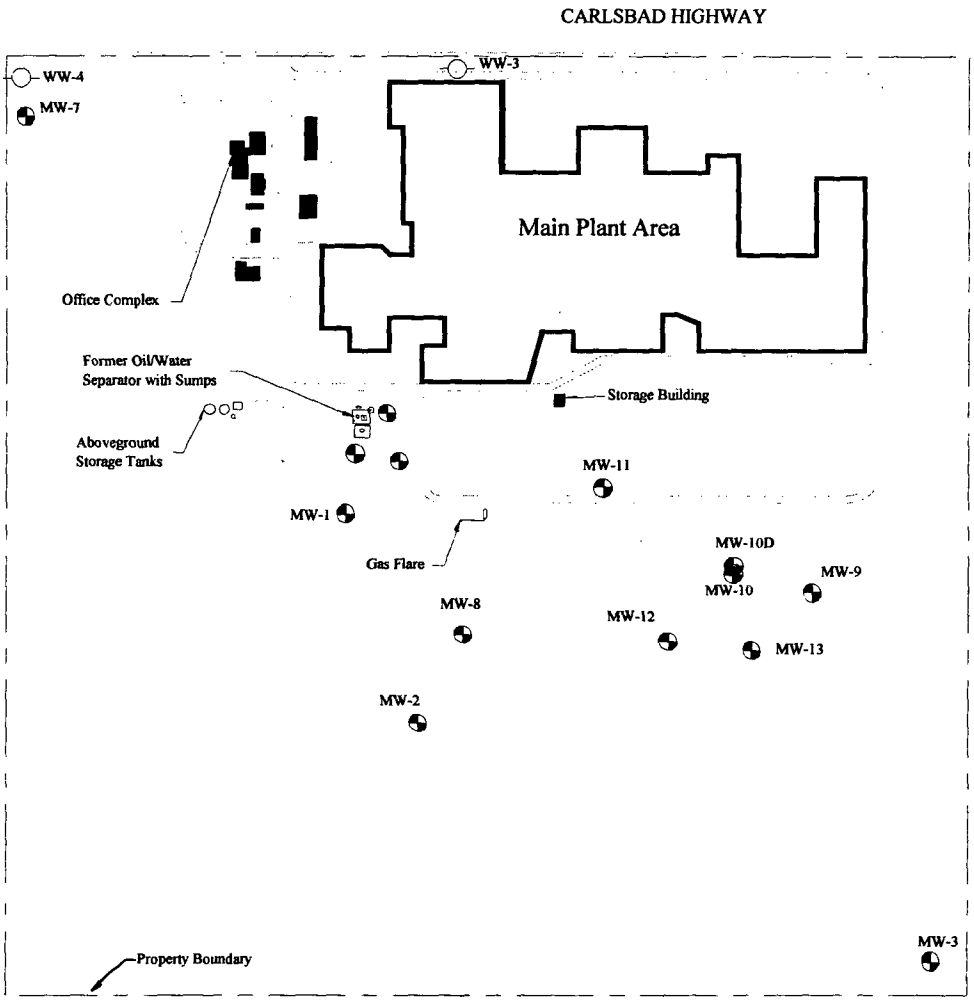
MAR 11 2004

Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

2003 Annual Groundwater Sampling and Monitoring Report
Duke Energy Field Services
Linam Ranch Natural Gas Plant
Lea County, New Mexico

FEBRUARY 16, 2004



Prepared By:

TRIDENT ENVIRONMENTAL

P O Box 7624
Midland, Texas 79708

2003 Annual Groundwater Monitoring Report
Duke Energy Field Services
Linam Ranch Gas Plant
Lea County, New Mexico

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SBMITTED BY:

Gilbert J. Van Deventer, REM
Project Manager

DATE: 02-16-04

REVIEWED BY:

Dale T. Littlejohn
Quality Assurance/Control Officer

DATE: 02-18-04

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FIGURES

TABLES

APPENDICES

REPORT

1.0 Executive Summary

Trident Environmental (Trident) was retained by Duke Energy Field Services (DEFS) to perform the sampling and monitoring operations at the Linam Ranch Plant. This 2003 Annual Groundwater Monitoring Report documents the two semi-annual sampling events performed by Trident at the DEFS Linam Ranch Plant on March 11-12, 2003 and September 17-18, 2003. This report also contains the historical groundwater elevation and analytical data and includes data from all monitoring wells on site. The monitoring and sampling program was conducted in accordance with the revised monitoring plan specified by Mr. Bill Olson of the New Mexico Oil Conservation Division (OCD) in his letter dated March 19, 1999.

Based on the sampling and monitoring data to date, the following conclusions relevant to groundwater conditions at the Linam Ranch Plant are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-9, MW-10D, MW-11, MW-12 and MW-13 were below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.

- Benzene levels in MW-4 (15.8 mg/L), MW-5 (0.116 mg/L), and MW-10 (1.34 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (former liquid waste disposal area) and the former EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of December 30, 2003, the light non-aqueous phase liquids (LNAPL) recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 19.6 gallons of LNAPL (condensate) from monitoring wells MW-4 and MW-6. A total of approximately 2.80 gallons of LNAPL was recovered during the 2003 calendar year. The measured thickness of LNAPL in MW-4 has remained at or below 0.01 feet since February 17, 2002, while the LNAPL thickness in MW-6 has varied from 0.01 feet on March 8, 2003, to 0.65 feet on October 28, 2003. The minimal LNAPL thickness in these two wells has allowed groundwater samples to be collected during 2003, with the exception of MW-6 during the September 2003 sampling event.

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2004.
- Continue LNAPL removal from MW-4 and MW-6 using absorbent socks or passive bailers with monthly inspections. Obtain groundwater samples from these two wells if the LNAPL thickness is less than 0.01 feet.

Chronology of Events

February 7, 1994	Geoscience Consultants Ltd (GCL) was retained by ENRON Operations Corporation (ENRON) to address groundwater quality conditions at the Hobbs Gas Plant, which was scheduled for acquisition by GPM. As part of a subsurface investigation for two areas within the plant, GCL completed temporary drive point wells DP-1 and DP-2 downgradient and upgradient, respectively, of the EOTT tanks, and one monitoring well, MW-8, downgradient of the former liquid waste disposal area. Hydrocarbon-impacted groundwater was identified in DP-1.
May 18-22, 1994	Daniel B. Stevens and Associates (DBS&A) completed seven temporary drive point wells (EOTT-1 through EOTT-7) to delineate the horizontal extent of hydrocarbon-impacted soils and groundwater in the EOTT tank area. Drive point well EOTT-6 was converted into monitoring well MW-9. Hydrocarbon-impacted groundwater was identified east of the EOTT tanks.
October 7, 1994	The OCD requested ENRON to provide a work plan to completely define the extent of groundwater contamination at the Hobbs Gas Plant.
November 1994	GPM acquired ownership and operation of the Linam Ranch Plant (formerly Hobbs Gas Plant) from ENRON.
February 23, 1995	GPM submitted a subsurface investigation work plan to the OCD to address the groundwater conditions at Linam Ranch Plant.
April 5, 1995	The OCD approved the subsurface investigation work plan.
May 10-13, 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 five monitoring wells (MW-10D, MW-10, MW-11, MW-12, and MW-13) and two soils borings (SB-1 and SB-2).
September 18, 1995	GPM submitted the *Subsurface Investigation and Preliminary Remedial Response* report for the Linam Ranch Plant to the OCD.
October 19, 1995	The OCD approved GPM's recommendations for remedial action, which included a quarterly sampling and monitoring program.
November 14, 1995	GCL conducted the fourth quarter 1995 sampling event at Linam Ranch Plant.
January 17, 1996	GCL conducted the first quarter 1996 sampling event at Linam Ranch Plant.

April 24, 1996	GCL conducted the annual (second quarter 1996) sampling event at Linam Ranch Plant. The annual report included recommendations to the OCD for continued monitoring on a semi-annual basis.
January 22, 1997	BDM International, Inc. (formerly GCL) conducted the semi-annual (first quarter 1997) sampling event.
February 5, 1997	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
August 15, 1997	BDM International, Inc. (BDM) conducted the third quarter 1997 (annual) sampling event.
December 11, 1997	GPM submitted the 1997 Annual Groundwater Monitoring and Sampling Report to the OCD.
January 22, 1998	BDM, a wholly owned subsidiary of TRW, conducted the semi-annual (first quarter 1998) sampling event.
March 25, 1998	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
July 22, 1998	TRW conducted the third quarter 1998 (annual) sampling event.
December 4, 1998	GPM submitted the 1998 Annual Groundwater Monitoring and Sampling Report to the OCD.
February 9, 1999	TRW conducted the semi-annual (first quarter 1999) sampling event.
February 10, 1999	GPM submitted a request to revise the monitoring plan to the OCD. The request proposed additional downgradient monitoring in the area of the EOTT tanks (MW-3) in lieu of installing additional wells. The request also proposed expanding the monitoring program to include semi-annual sampling of monitoring wells in the vicinity of the former liquid waste disposal area.
March 19, 1999	The OCD approved GPM's proposed request to revise the monitoring plan.
August 24-25, 1999	TRW conducted the annual (third quarter 1999) sampling event.
October 26, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.
November 22, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.
December 20, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.

January 26, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.
February 22-23, 2000	TRW conducted the semi-annual (first quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and the absorbent sock in MW-6 was removed.
April 4, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and gauge the product thickness in MW-4 and MW-6.
April 24, 2000	TRW conducted a site visit to empty the passive bailer in MW-4, gauge the product thickness in MW-4 and MW-6, and install a new absorbent sock in MW-6.
June 15, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, and replace the absorbent sock in MW-6.
July 12, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, and check the absorbent sock in MW-6. Product from the sock in MW-6 was squeezed out and returned to the well.
August 17-18, 2000	TRW conducted the annual (third quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and replaced with an absorbent sock. The absorbent sock in MW-6 was checked and replaced.
October 2, 2000	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
December 14, 2000	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
January 23, 2001	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
February 6-7, 2001	TRW conducted the semi-annual (first quarter 2001) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and/or replaced.

March 21, 2001	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
May 1, 2001	Trident Environmental acquired the Midland Texas resources of TRW, Inc.
May 16, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
June 19, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
July 20, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
August 2-3, 2001	Trident conducted the annual (third quarter 2001) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and replaced.
September 11, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
October 9, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
November 8, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
December 10, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
January 14, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
February 17, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
March 11-12, 2002	Trident conducted the semi-annual (first quarter 2002) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and/or replaced.

April 9, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
May 14, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
June 18, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
July 11, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
August 14, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
September 25-26, 2002	Trident conducted the annual (third quarter 2002) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and replaced.
October 24, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
November 22, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
December 17, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
January 14, 2003	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
February 19, 2003	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
March 11-12, 2003	Trident conducted the semi-annual (first quarter 2003) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and/or replaced.
April 23, 2003	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.

May 29, 2003	Trident conducted a site visit to gauge the product thickness and recover product from the absorbent socks in MW-4 and MW-6. The absorbent sock in MW-6 was replaced with a passive bailer.
June 23, 2003	Trident conducted a site visit to gauge product thickness, and recover product from the absorbent sock in MW-4 and the passive bailer in MW-6.
July 30, 2003	Trident conducted a site visit to gauge product thickness, and recover product from the absorbent sock in MW-4 and the passive bailer in MW-6.
August 20, 2003	Trident conducted a site visit to gauge product thickness, and recover product from the absorbent sock in MW-4 and the passive bailer in MW-6.
September 17-18, 2003	Trident conducted the annual (third quarter 2003) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and replaced.
October 28/30, 2003	Trident conducted a site visit to gauge product thickness, and recover product from the absorbent sock in MW-4 and the passive bailer in MW-6.
November 21, 2003	Trident conducted a site visit to gauge product thickness, and recover product from the absorbent sock in MW-4 and the passive bailer in MW-6.
December 8/30, 2003	Trident conducted a site visit to gauge product thickness, and recover product from the absorbent sock in MW-4 and the passive bailer in MW-6.

3.0 Procedures

During each sampling event, all on-site monitoring wells were gauged for depth to groundwater using a Solinst Model 101 water level indicator with the exception of MW-4 and MW-6, which were gauged using a GeoTech electronic water/product interface probe. During both sampling events in 2003 all of the monitoring wells were sampled, with the exception of MW-6 during the September 2003 sampling event due to presence of LNAPL. Immediately prior to collecting groundwater samples, a minimum of three well volumes was purged using a decontaminated submersible pump, or purged by hand using a decontaminated PVC bailer. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen (DO) were measured during and after purging using a Milwaukee Model SM600 DO meter, and a Hanna Model 98130 pH, conductivity, and temperature meter. Groundwater samples were collected after these parameters stabilized. A total of 453 gallons of water was purged from monitoring wells during the two 2003 sampling events. Groundwater samples were obtained using a new, clean, 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 benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. 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. The annual sampling event conducted on September 17-18, 2003, included a third and fourth set of water samples that were transferred into appropriately preserved containers for analysis of chlorides and total dissolved solids (TDS) and WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver). Samples for metals analysis were filtered in the field with a 45mm element. Also, ferrous iron was measured in the field using a Hach DR2010 spectrophotometer (Hach Method 8146). A summary of purging and sampling methods is provided on Table 1. 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. Most samples were shipped to Trace Analysis, Inc. of Lubbock, Texas for laboratory analysis. A portion of the samples were delivered to Cardinal Laboratories in Hobbs, New Mexico (March 10-11, 2003 sampling event) and Environmental Lab of Texas in Odessa, Texas (September 17-18, 2003 sampling event) in order to meet the 48 hour holding time for nitrate.

4.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by Trident on September 17, 2003, the groundwater conditions at the Linam Ranch Plant are characterized below.

- The depth to the water table is approximately 48 feet below ground surface in the site area.
- The hydraulic gradient is approximately 0.0028 feet/foot.
- The direction of groundwater flow is to the southeast.
- The water table elevation has decreased an average of 0.2 feet across the site since May 1995.

The direction of groundwater flow and hydraulic gradient has remained consistent for the past eight and a half years, however the groundwater elevations have steadily decreased at the rate of approximately 0.2 feet per year during this time.

Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the two year 2003 sampling events are presented in Figure 2A (March 8, 2003) and Figure 2B (September 17, 2003). Historical groundwater elevations and depth to water measurements are summarized on Table 2, and depicted graphically in Figure 2.

5.0 Groundwater Quality Conditions

5.1 Distribution of Hydrocarbons in Groundwater

A historical listing of benzene, toluene, ethylbenzene and xylene (BTEX) concentrations obtained from the on site monitoring wells is summarized in Table 3. Hydrocarbon concentration maps depicting the BTEX concentrations for the two 2003 sampling events are presented in Figure 3A (March 10-11, 2003) and Figure 3B (September 17-18, 2003). Figures 4 (A through H) graphically depict the BTEX concentrations in groundwater and the groundwater elevations versus time (monitoring period) for monitoring wells MW-4, MW-5, MW-6, MW-9, MW-10, MW-10D, MW-11, and MW-13, respectively.

Based on the analytical results, the distribution of hydrocarbons at the Linam Ranch Plant is described below.

- BTEX concentrations in monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-9, MW-10D, MW-11, MW-12 and MW-13 were below the WQCC standards for each constituent.
- Benzene levels in MW-4 (15.8 mg/L), MW-5 (0.116 mg/L), and MW-10 (1.34 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.
- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (liquid waste disposal area) and the former EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

5.2 Distribution of WQCC Metals and Ions in Groundwater

Historical groundwater sample analytical results for WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver) and selected ions (chloride and TDS) are presented in Table 4. The WQCC standards are also listed in the table 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.

During the 2003 annual sampling event, analyses for aluminum, cadmium, chromium, and silver were discontinued since these constituents have been below WQCC standards for over four years (over seven years in most cases). However, analysis for arsenic, barium, iron, and manganese were continued. The WQCC standard for iron was exceeded in monitoring wells MW-4 (12.6 mg/L) and MW-5 (8.02 mg/L), and manganese in MW-5 (0.586 mg/L), MW-10 (0.422 mg/L), and MW-10D (0.313 mg/L). The elevated levels of iron and manganese appear to 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 resulting in higher concentrations. Based on the results of the metal analyses during the annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals.

During the 2003 annual sampling event, arsenic concentrations were below WQCC standards (0.1 mg/L) and below the laboratory detection limit (0.05 mg/L) for all monitoring wells with the marginal exception of MW-1 (0.117 mg/L) and MW-4 (0.119 mg/L). Other than natural conditions, there is no known source that explains the occurrence of arsenic in MW-1 and MW-4.

Barium concentrations were below the WQCC standard of 1.0 mg/L for each monitoring well during the 2003 annual sampling event. Other than natural conditions, there is no known source that explains the occurrence of barium.

Analyses of chlorides during the annual 2003 sampling event indicate the WQCC standard of 250 mg/L was not exceeded with the exception of MW-4 (691 mg/L) and MW-13 (267 mg/L). The TDS concentrations in MW-1 (1,410 mg/L), MW-4 (1,836 mg/L), MW-5 (1,310 mg/L), MW-10 (1,076 mg/L), MW-10D (1,088 mg/L), and MW-13 (1,198 mg/L) were slightly above the WQCC standards of 1,000 mg/L. The elevated chloride and TDS levels observed in the aforementioned monitoring wells do not represent a significant risk to human health or the environment. Chloride and TDS concentrations in the remaining monitoring wells were below the WQCC standards.

Since the groundwater on site is not used for potable drinking water, nor will it be in the foreseeable future, and the constituents of concern above WQCC standards are limited to being on site, there is low risk to human health and the environment.

6.0 Intrinsic Bioremediation Assessment

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), manganese (Mn), 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 an 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 manganese (Mn^{3+}) and ferric iron (Fe^{3+}) are electron acceptors, they are reduced to their lower valence state, and Mn^{2+} and Fe^{2+} concentrations increase. In anaerobic systems where sulfate is an 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).

DO, nitrate, sulfate, total iron, ferrous iron, and manganese concentrations are listed in Table 5. Changes in DO, nitrate, and sulfate concentrations with time on the east side and west side of the plant are depicted in Figures 5A, 5B, 6A, 6B, 7A and 7B, respectively.

One approach in accessing the efficacy of natural attenuation, is to observe changes in electron acceptor concentrations over time that may be related to subsurface biodegradation. The relationships in the electron acceptor data are observed:

- The general decline in dissolved oxygen levels on the east side of the plant appears to indicate oxygen utilization during biodegradation processes. DO levels fluctuate over time on the west side of the plant therefore no trend relationship is noted.

- Nitrate and sulfate concentrations fluctuate over time therefore no trend relationship is readily apparent. However, the presence of this constituent as an electron acceptor indicates its availability for use by microorganisms in the course of hydrocarbon degradation.

Another approach to analyzing the efficacy of biodegradation is to compare the concentrations of various biological parameters versus the downgradient distance from the source of hydrocarbons. For this reason, monitoring wells were plotted with respect to their distance from the nearest source area on the east side and west side of the plant in Figures 8A and 8B, respectively, to evaluate if any trends were evident. With this analysis the following relationships in the electron acceptor data are observed:

- Generally, DO values are low and benzene values are high within the plume indicating that oxygen is being utilized as an electron acceptor (aerobic respiration).
- Nitrate and sulfate concentrations exhibit decreasing tendencies in the downgradient direction as they are being utilized as electron acceptors indicating denitrification and sulfate reduction processes are occurring.
- Manganese concentrations are higher within the plume indicating that manganese in solute form is a metabolic byproduct resulting from anaerobic biodegradation processes.
- Ferric and ferrous concentrations are higher within the plume indicating the availability of ferric iron as an electron acceptor and ferrous iron being produced as a metabolic byproduct.

In another approach, using stoichiometric derivations, the mass of benzene degraded per unit mass of electron acceptor utilized and metabolic byproduct produced was calculated to determine the biodegradation capacity of these constituents relative to the highest and average benzene concentration observed on site. 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/Produced	Concentrations of Electron Acceptors/ Byproducts (mg/L)	Biodegradation Capacity of Electron Acceptors/ Byproducts (mg/L)
DO	Aerobic Respiration	Decreases	0.326	6.88	2.24
Mn^{2+}	Manganese Reduction	Increases	0.14	0.586	0.08
NO_3	Denitrification	Decreases	0.21*	5.60	1.18
Fe^{2+}	Ferric Iron Reduction	Increases	0.046	5.92	0.27
SO_4	Sulfate Reduction	Decreases	0.22*	199	43.8
				Total Biodegradation Capacity	47.6
				Highest benzene concentration observed on site	15.8
				Average benzene concentration observed on site	1.2

* Conservative assumption (does not take into account microbial cell mass production).
Degradation capacity based on values provided by "*Technical Protocol for Implementing Intrinsic Remediation With Long-Term Monitoring of Natural Attenuation of Fuel-Contamination Dissolved in Groundwater*" (Volume 1, 1995, Air Force Center for Environmental Excellence, Technology Transfer Division)

The calculated biodegradation capacity of electron acceptors and metabolic byproducts (47.6 mg/L) exceeds the highest benzene concentration (15.8 mg/L) observed on site by a factor of four. The biodegradation capacity of electron acceptors and metabolic byproducts far exceeds the average benzene concentration (1.2 mg/L) observed on site by a ratio of 38 to 1. This indicates that the biodegradation process will continue.

7.0 Free Product Recovery

Hydrophobic adsorbent socks and/or passive bailers have been used in monitoring wells MW-4 and MW-6 to recover free product from the groundwater beneath the former oil/water separator system at Linam Ranch Plant since 1998. The absorbent sock in MW-6 was replaced with a passive bailer on May 29, 2003 to increase recovery rates due to increased product thickness in that well. A total of approximately 2.80 gallons of LNAPL was recovered during the 2003 calendar year. As of December 30, 2003, the product recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 19.6 gallons of free product from MW-4 and MW-6. Product thickness and recovery volumes are listed on Table 6. Figures 9A and 9B graphically depict the produce thickness and cumulative recovery versus time for MW-4 and MW-6, respectively.

8.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Linam Ranch Plant are presented below.

- BTEX concentrations in monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-10D, MW-11, MW-12 and MW-13 were below the WQCC standards for each constituent.

- Benzene levels in MW-4 (15.8 mg/L), MW-5 (0.116 mg/L), and MW-10 (1.34 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (former liquid waste disposal area) and the former EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of December 30, 2003, the LNAPL recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 19.6 gallons of LNAPL from monitoring wells MW-4 and MW-6. A total of approximately 2.80 gallons of LNAPL was recovered during the 2003 calendar year. The measured thickness of LNAPL in MW-4 has remained at or below 0.01 feet since February 17, 2002, while the LNAPL thickness in MW-6 has varied from 0.01 feet on March 8, 2003, to 0.65 feet on October 28, 2003. The minimal LNAPL thickness in these two wells has allowed groundwater samples to be collected during 2003, with the exception of MW-6 during the September 2003 sampling event.

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

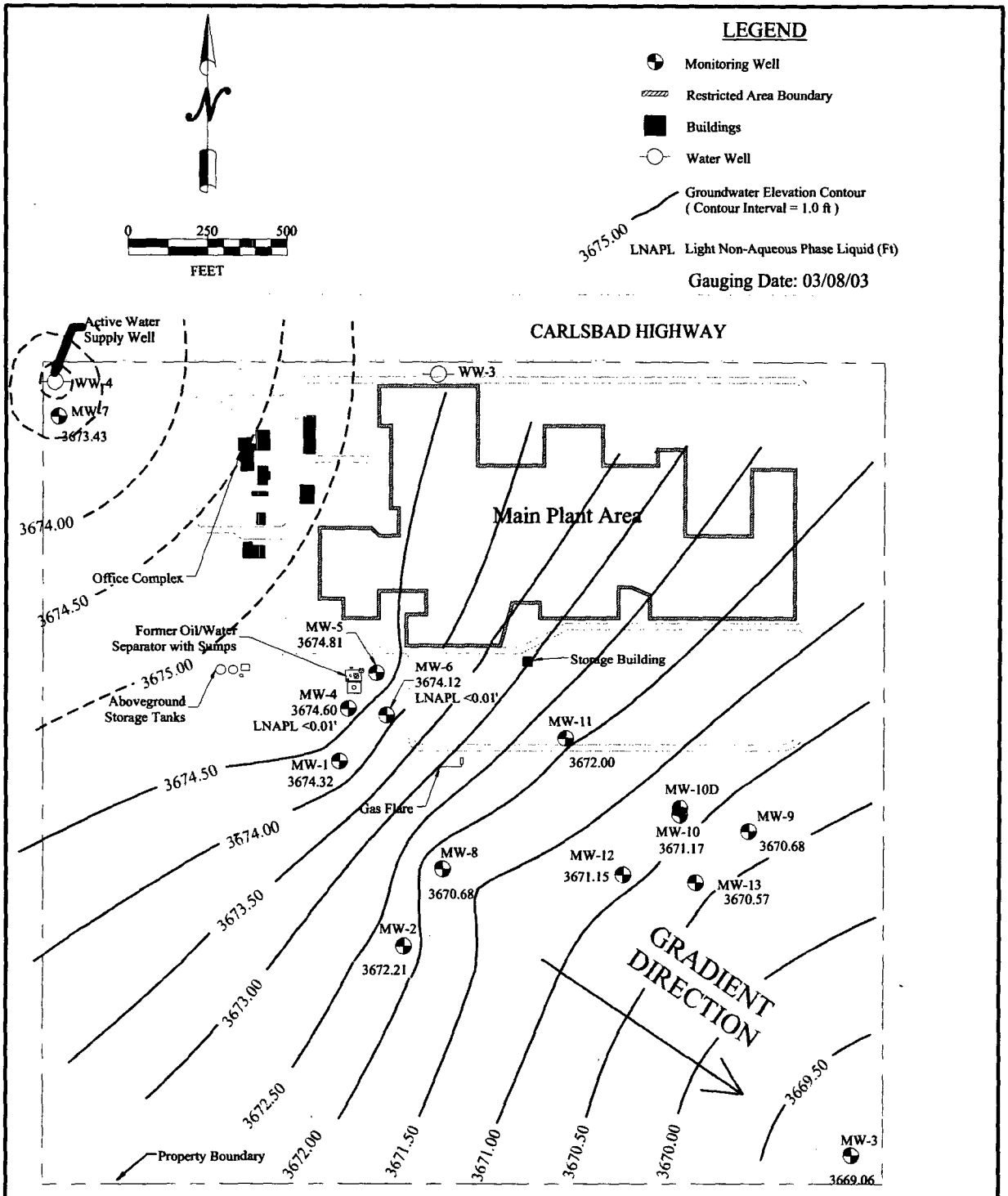
- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

9.0 Recommendations

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2004.
- Continue LNAPL removal from MW-4 and MW-6 using absorbent socks or passive bailers with monthly inspections. Obtain groundwater samples from these two wells if the LNAPL thickness is less than 0.01 feet.

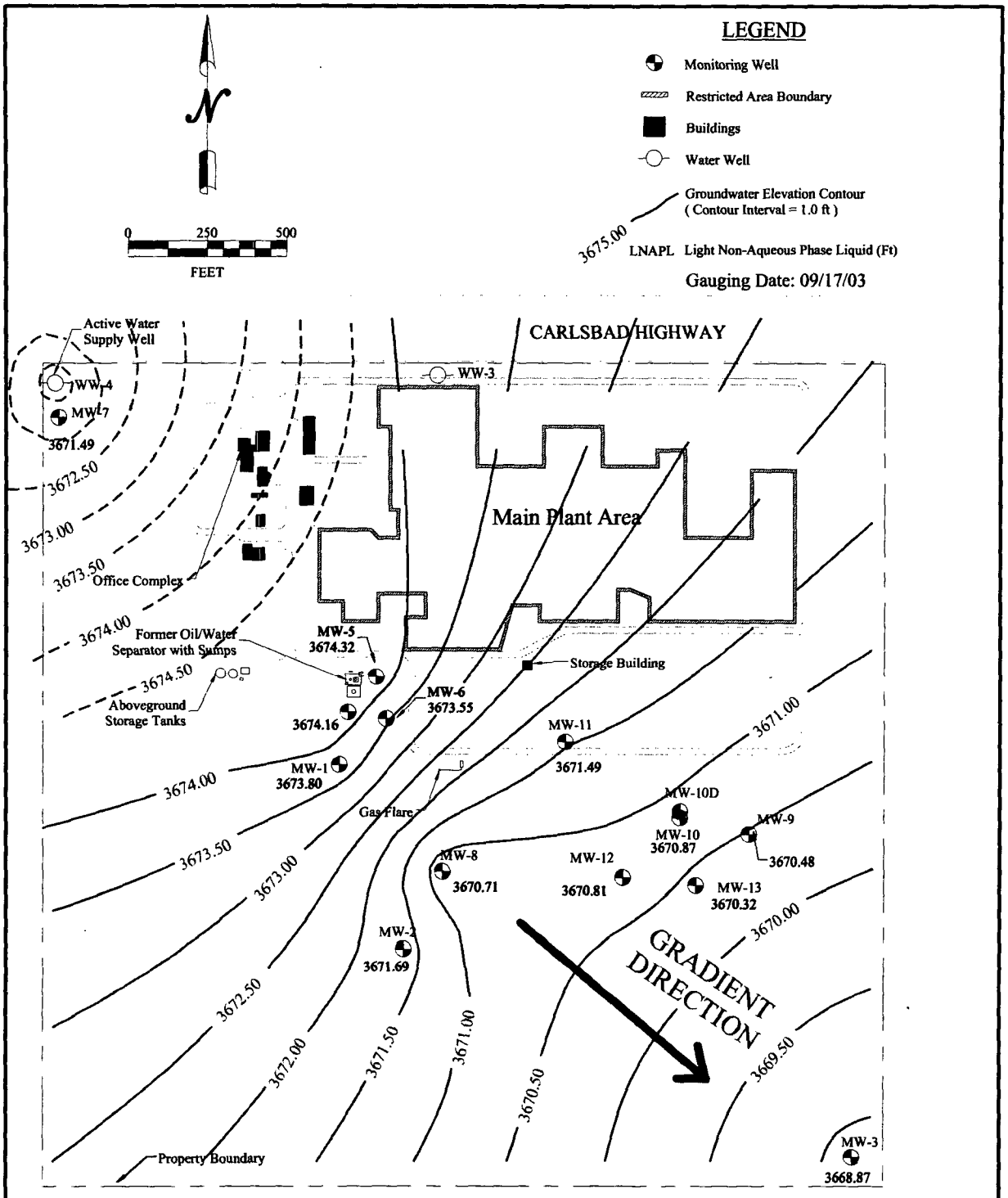
FIGURES



TRIDENT ENVIRONMENTAL

CLIENT: DEFS - Linam Ranch Plant	
DATE: 03/08/03	FILE: LINAM0903
AUTHOR: GJV	DRAWN BY: GJV
CK'D BY: DTL	SCALE: 1"=500'

Figure 1A
GROUNDWATER ELEVATION MAP

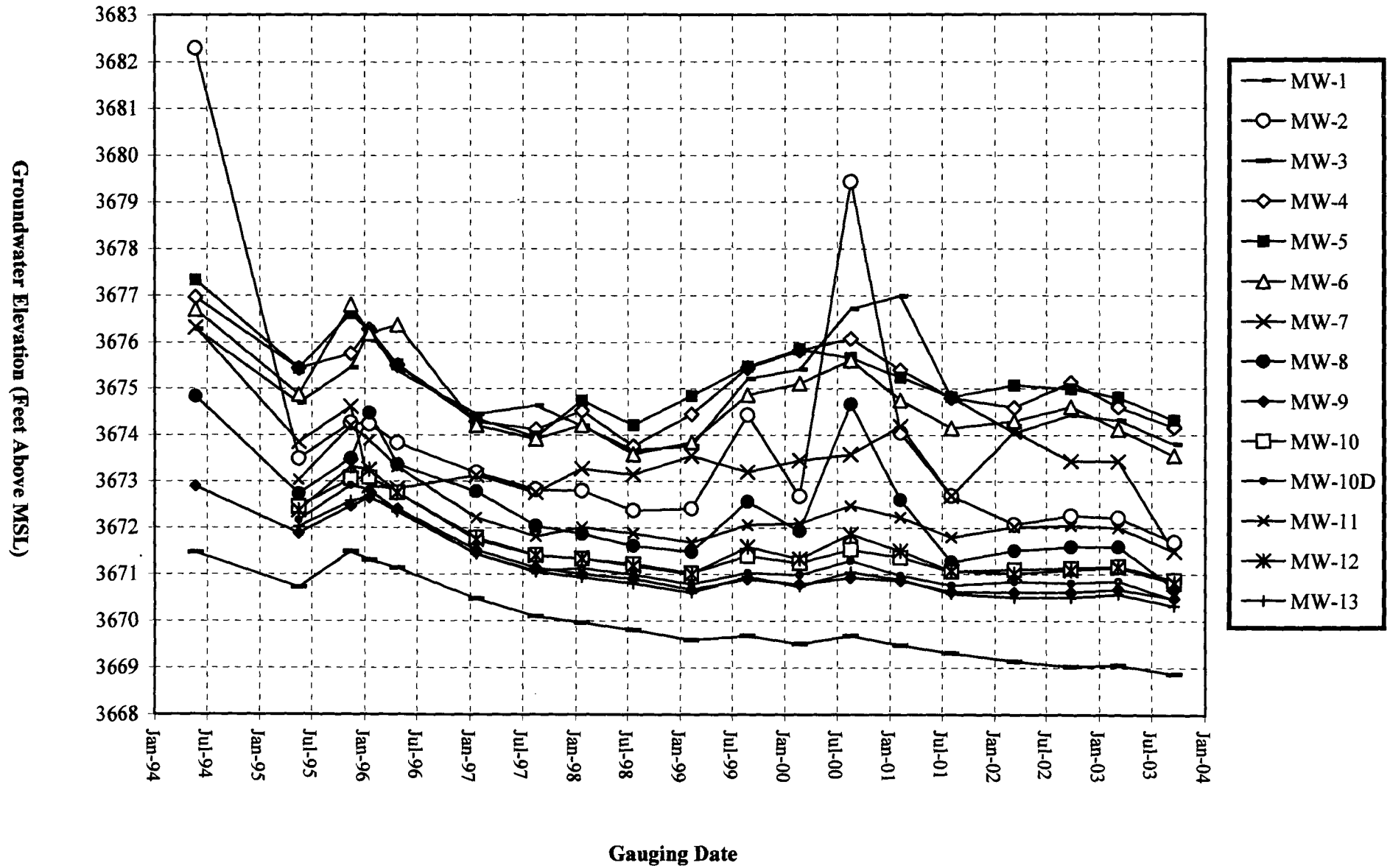


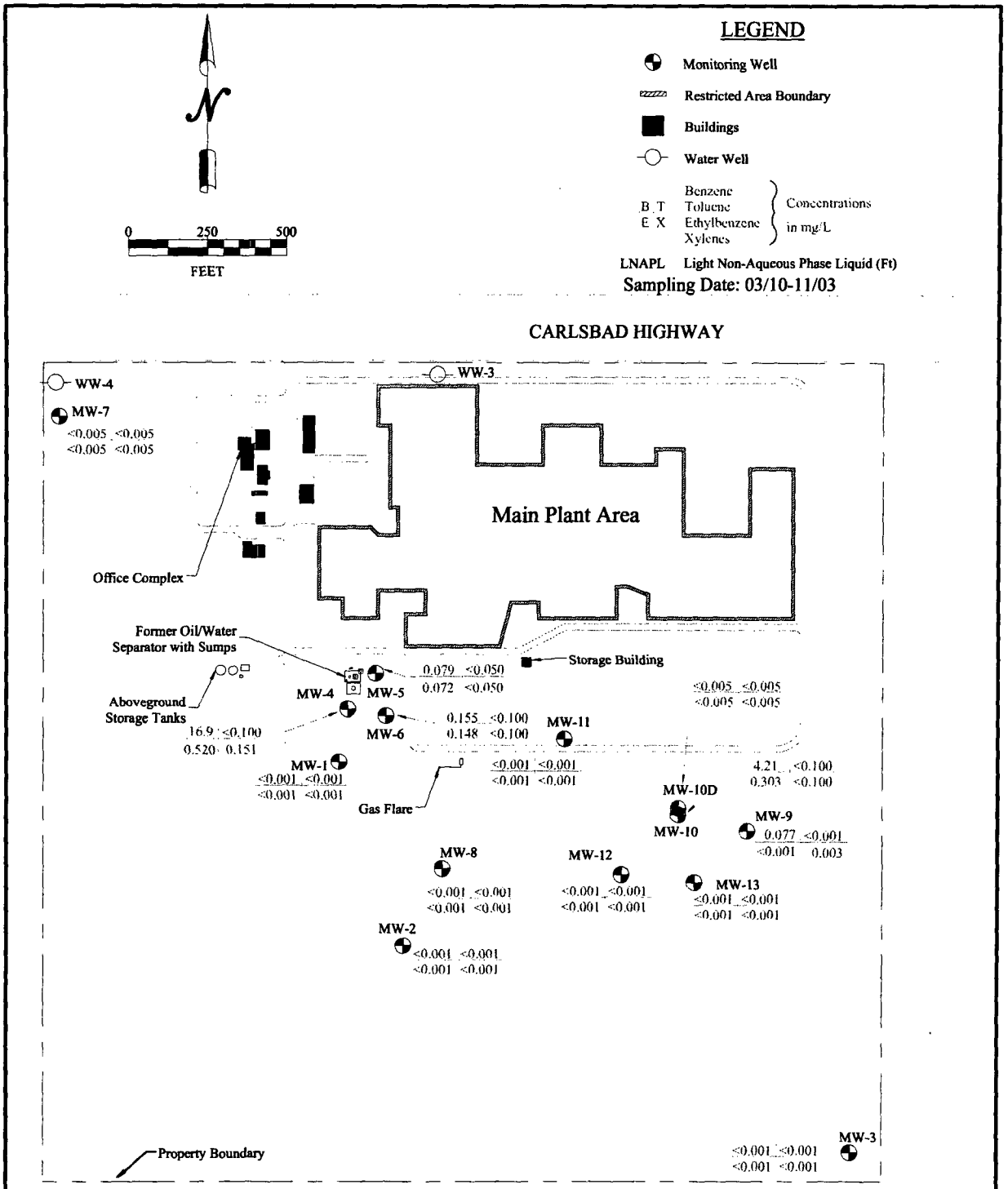
TRIDENT ENVIRONMENTAL

CLIENT: DEFS - Linam Ranch Plant	
DATE: 09/17/03	FILE: LINAM0903
AUTHOR: GJV	DRAWN BY: GJV
CK'D BY: DTL	SCALE: 1"=500'

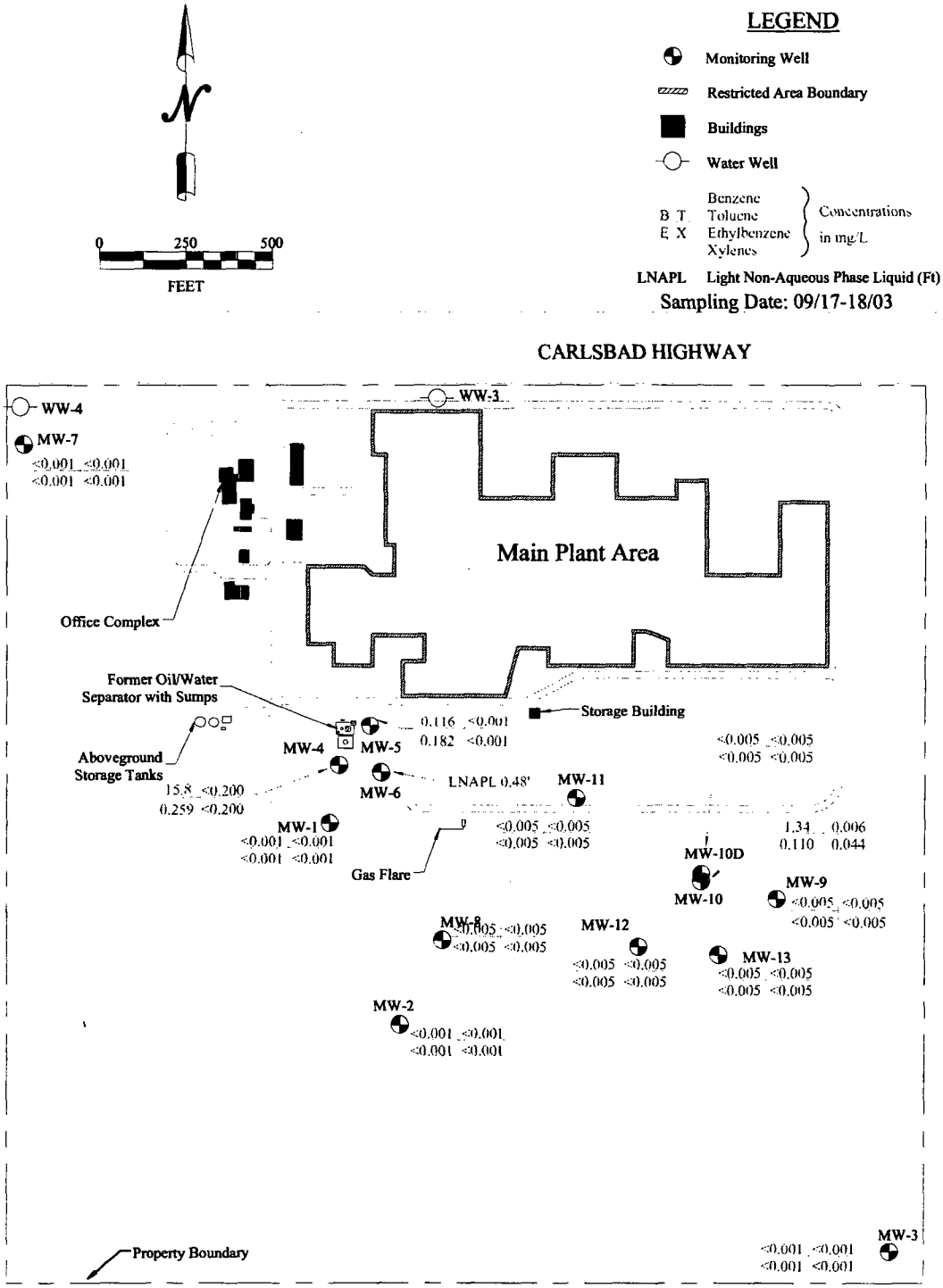
Figure 1B
GROUNDWATER ELEVATION MAP

FIGURE 2
Groundwater Elevation Versus Time





TRIDENT ENVIRONMENTAL	CLIENT: DEFS - Linam Ranch Plant	Figure 3A BTEX CONCENTRATION MAP
	DATE: 03/10-11/03 / FILE: LINAM0903	
	AUTHOR: GJV / DRAWN BY: GJV	
	CK'D BY: DTL / SCALE: 1"=500'	



TRIDENT ENVIRONMENTAL	CLIENT: DEFS - Linam Ranch Plant	Figure 3B BTEX CONCENTRATION MAP
	DATE: 09/17-18/03 / FILE: LINAM0903	
	AUTHOR: GJV / DRAWN BY: GJV	
	CK'D BY: DTL / SCALE: 1"=500'	

FIGURE 4A

BTEX Concentration and Groundwater Elevation Versus Time (MW-4)

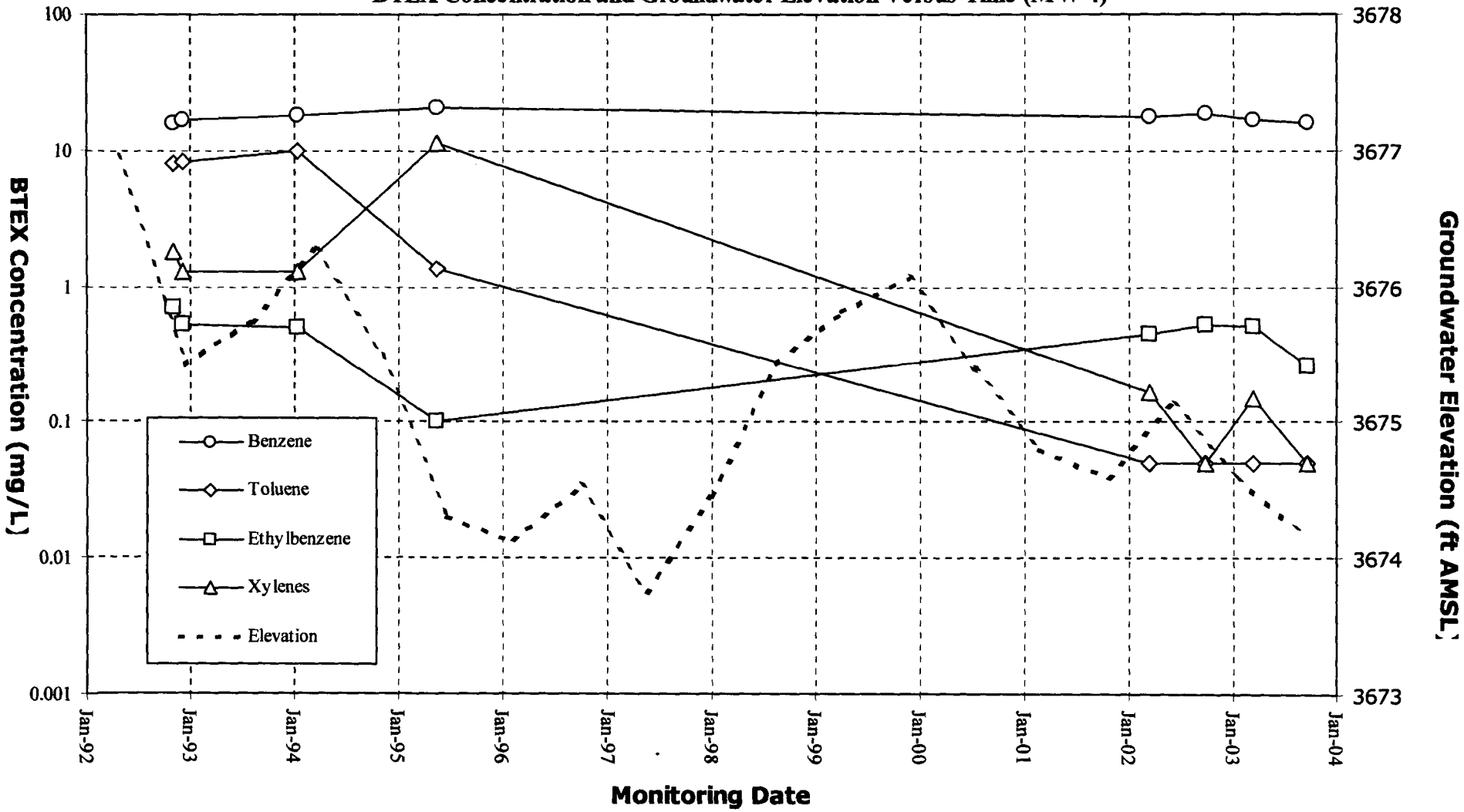


FIGURE 4B

BTEX Concentration and Groundwater Elevation Versus Time (MW-5)

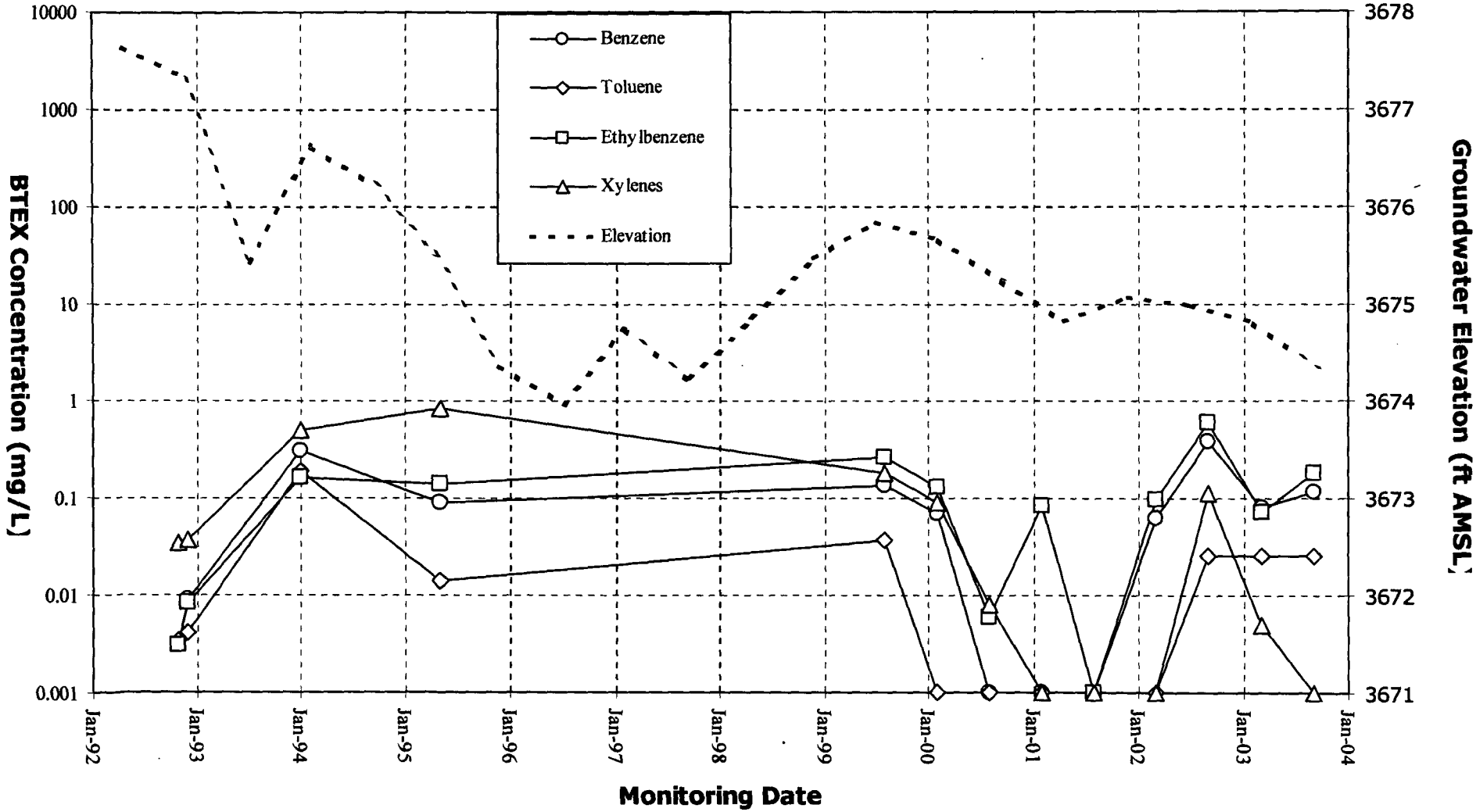


FIGURE 4C
BTEX Concentration and Groundwater Elevation Versus Time (MW-6)

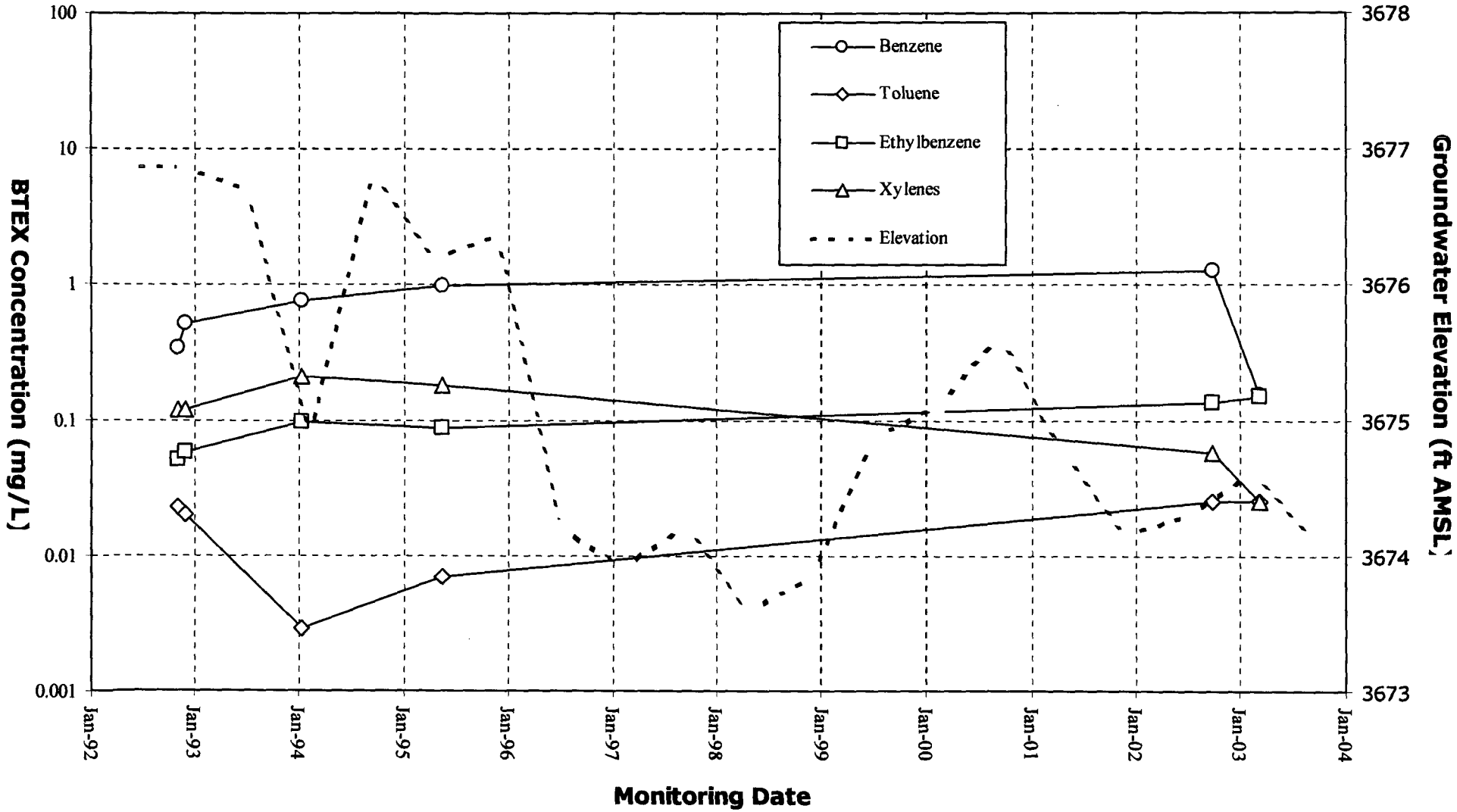


FIGURE 4D

BTEX Concentration and Groundwater Elevation Versus Time (MW-9)

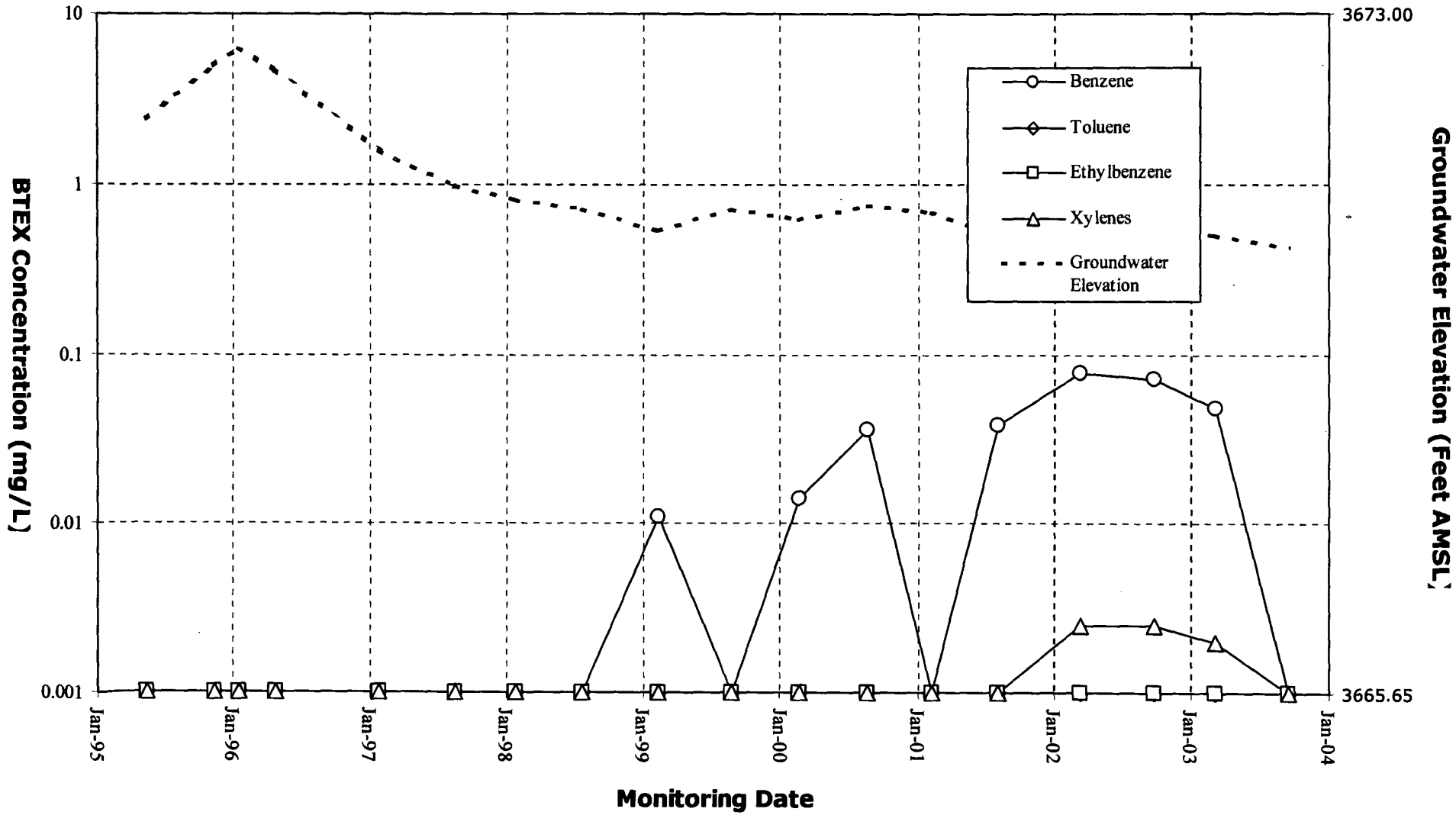


FIGURE 4E

BTEX Concentration and Groundwater Elevation Versus Time (MW-10)

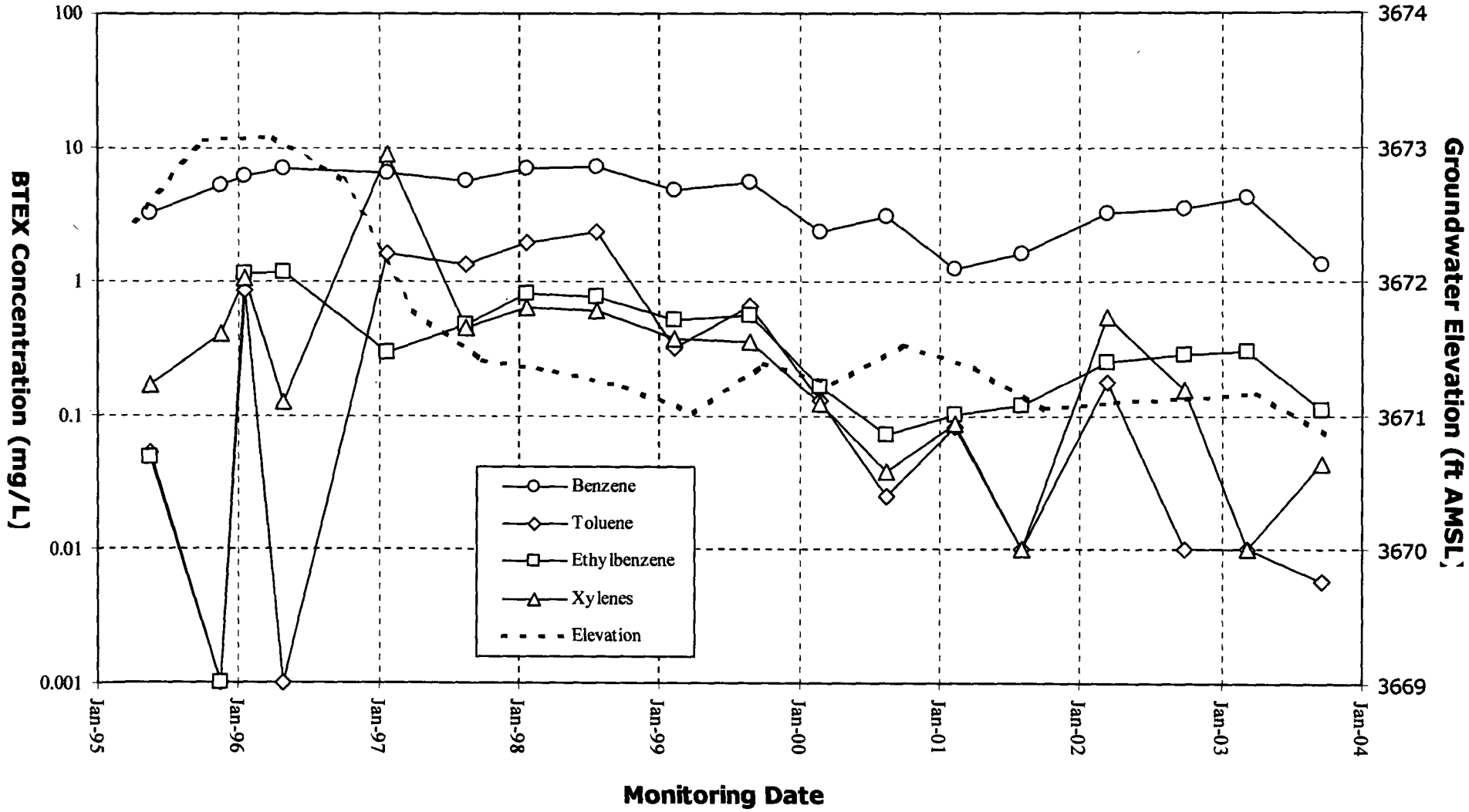


FIGURE 4F

BTEX Concentration and Groundwater Elevation Versus Time (MW-10D)

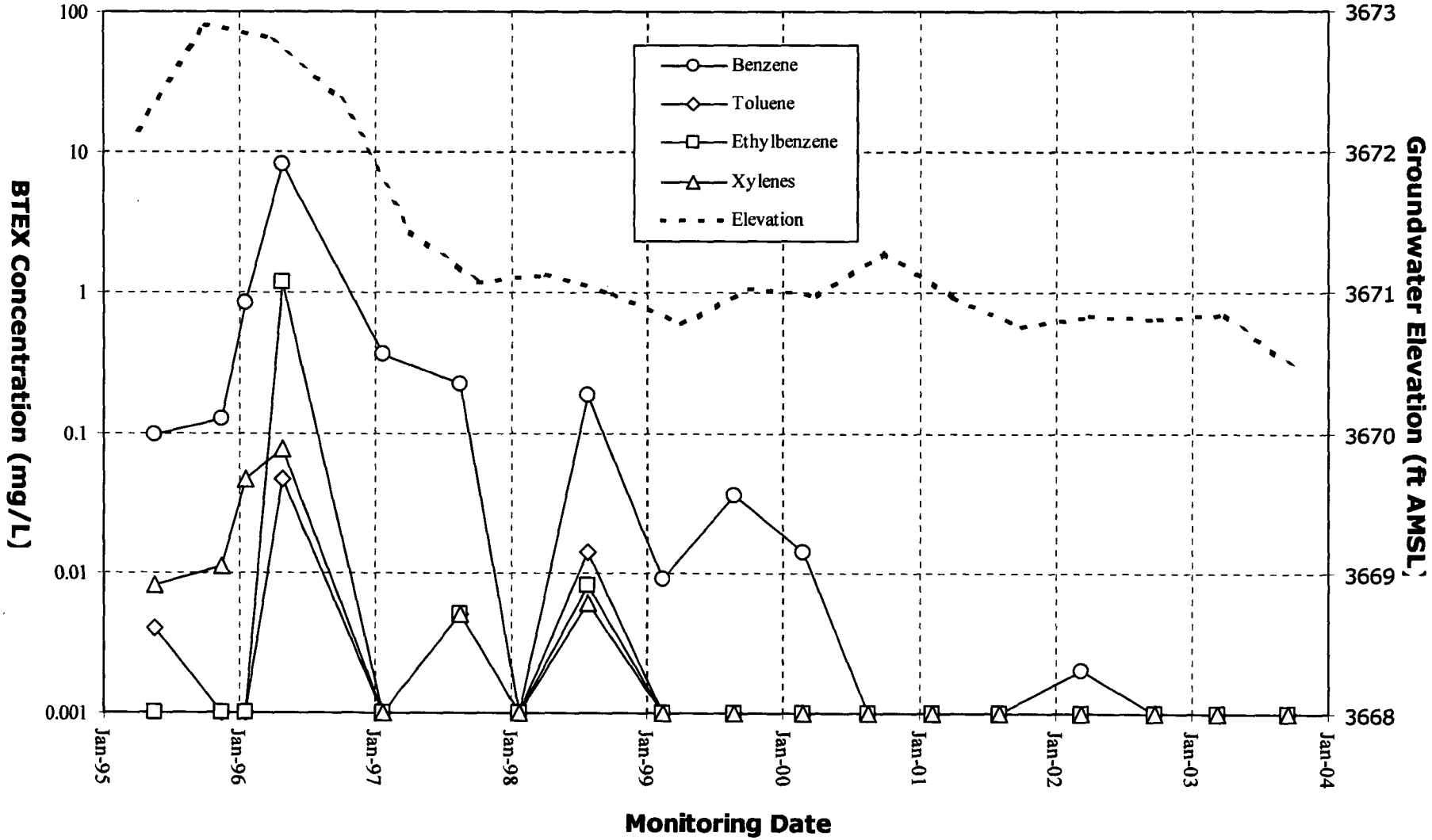


FIGURE 4G
BTEX Concentration and Groundwater Elevation Versus Time (MW-11)

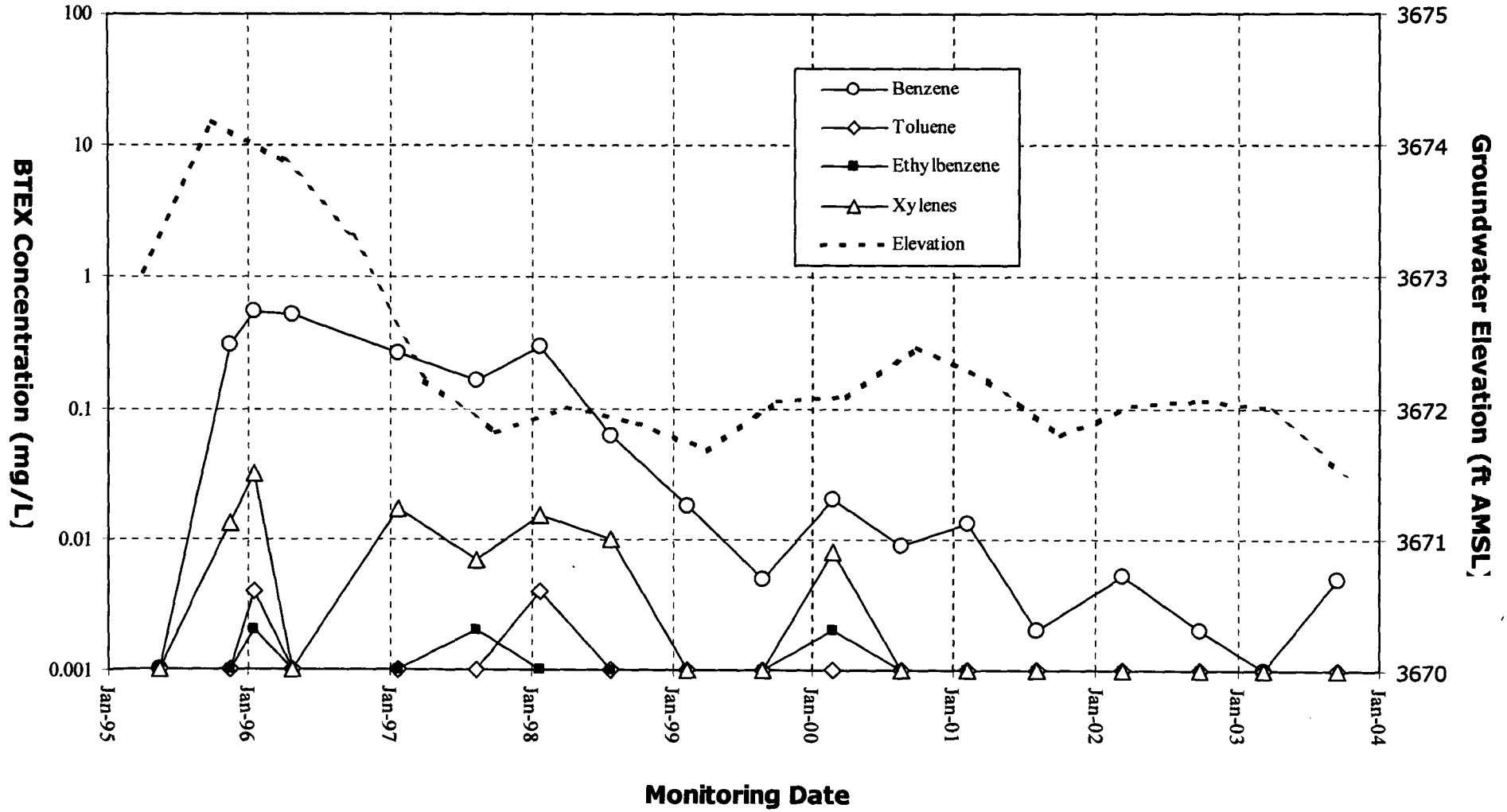


FIGURE 4H

BTEX Concentration and Groundwater Elevation Versus Time (MW-13)

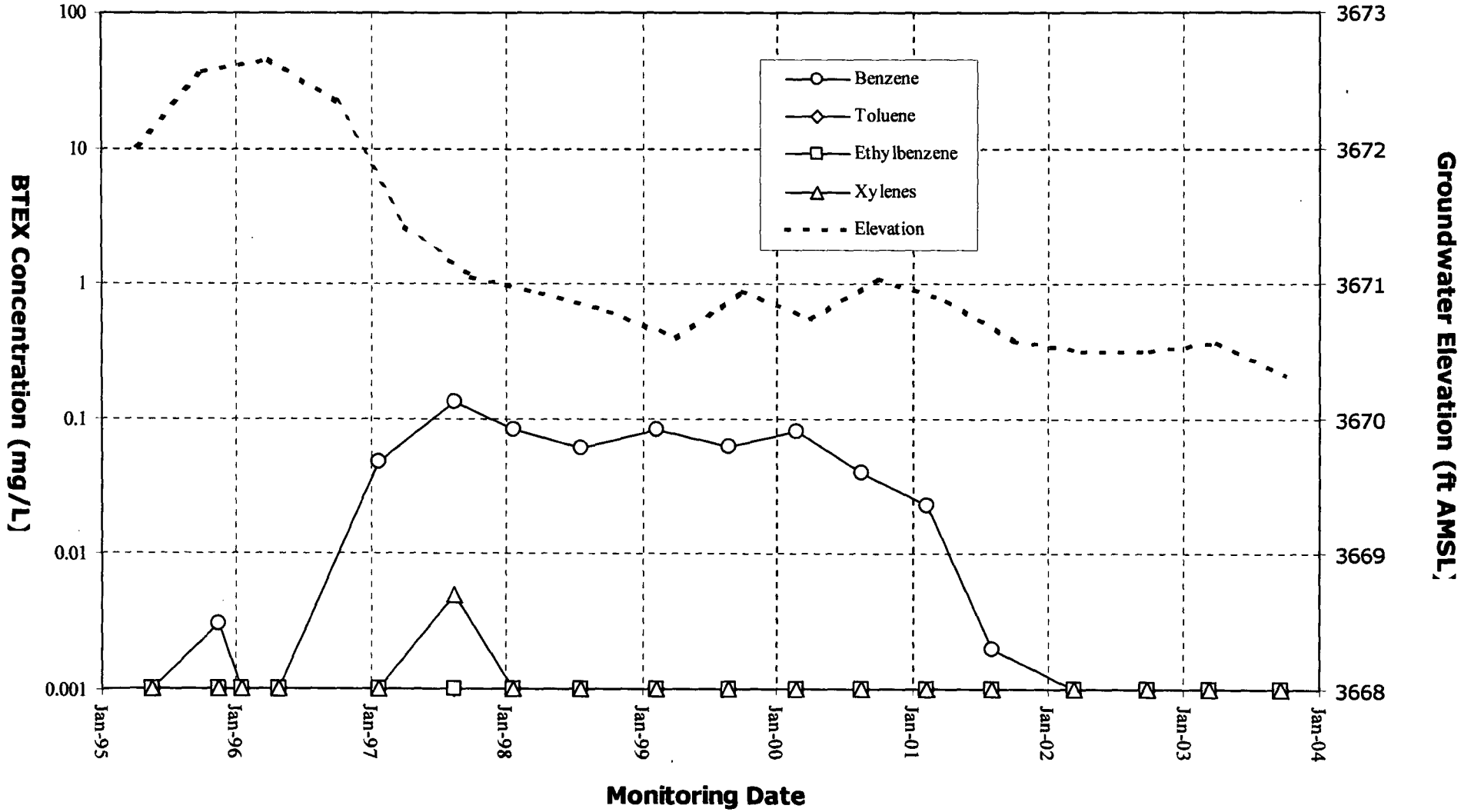


FIGURE 5A
Dissolved Oxygen Concentrations Versus Time
(WEST SIDE OF PLANT)

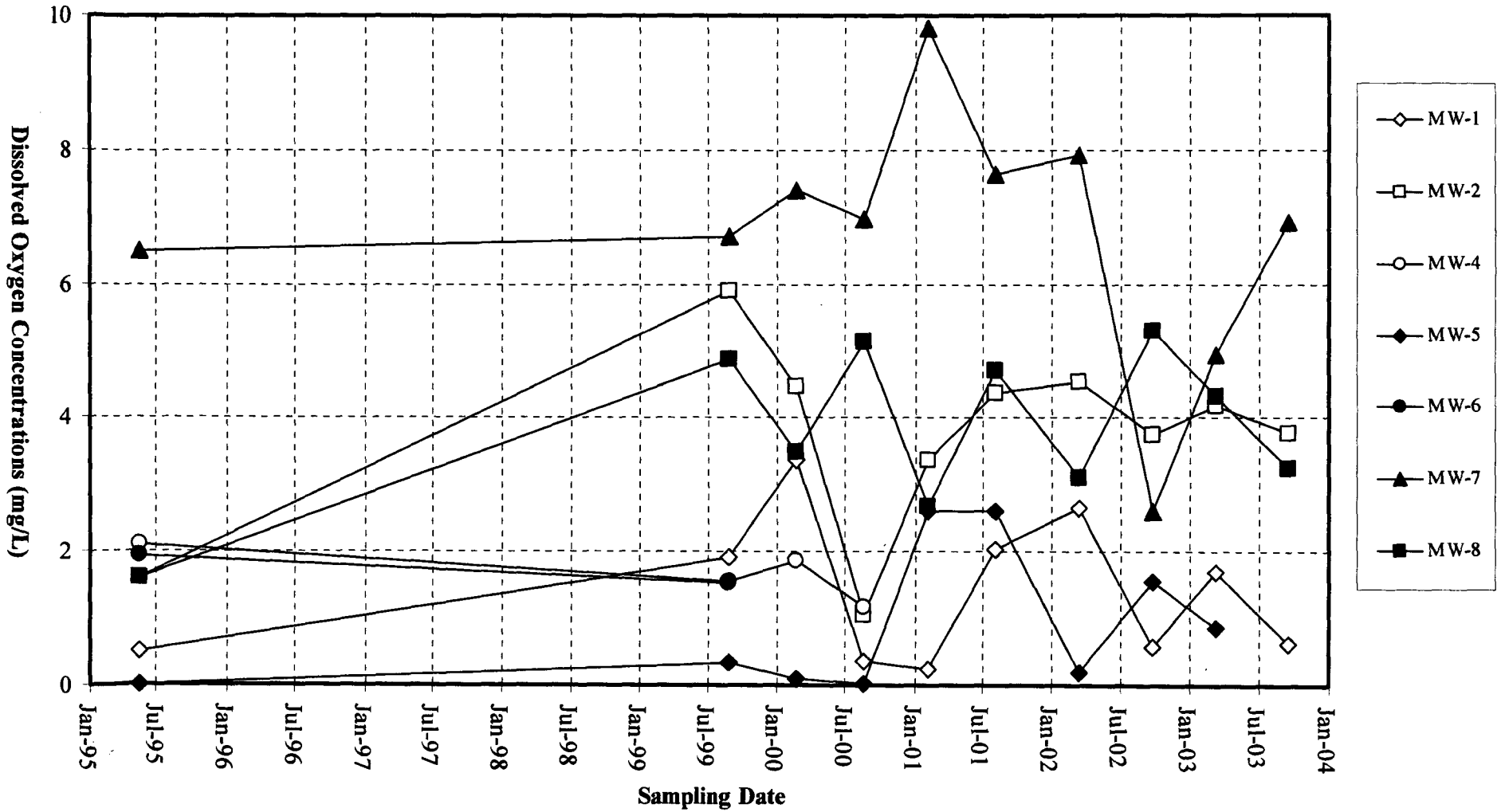


FIGURE 5B
Dissolved Oxygen Concentrations Versus Time
(EAST SIDE OF PLANT)

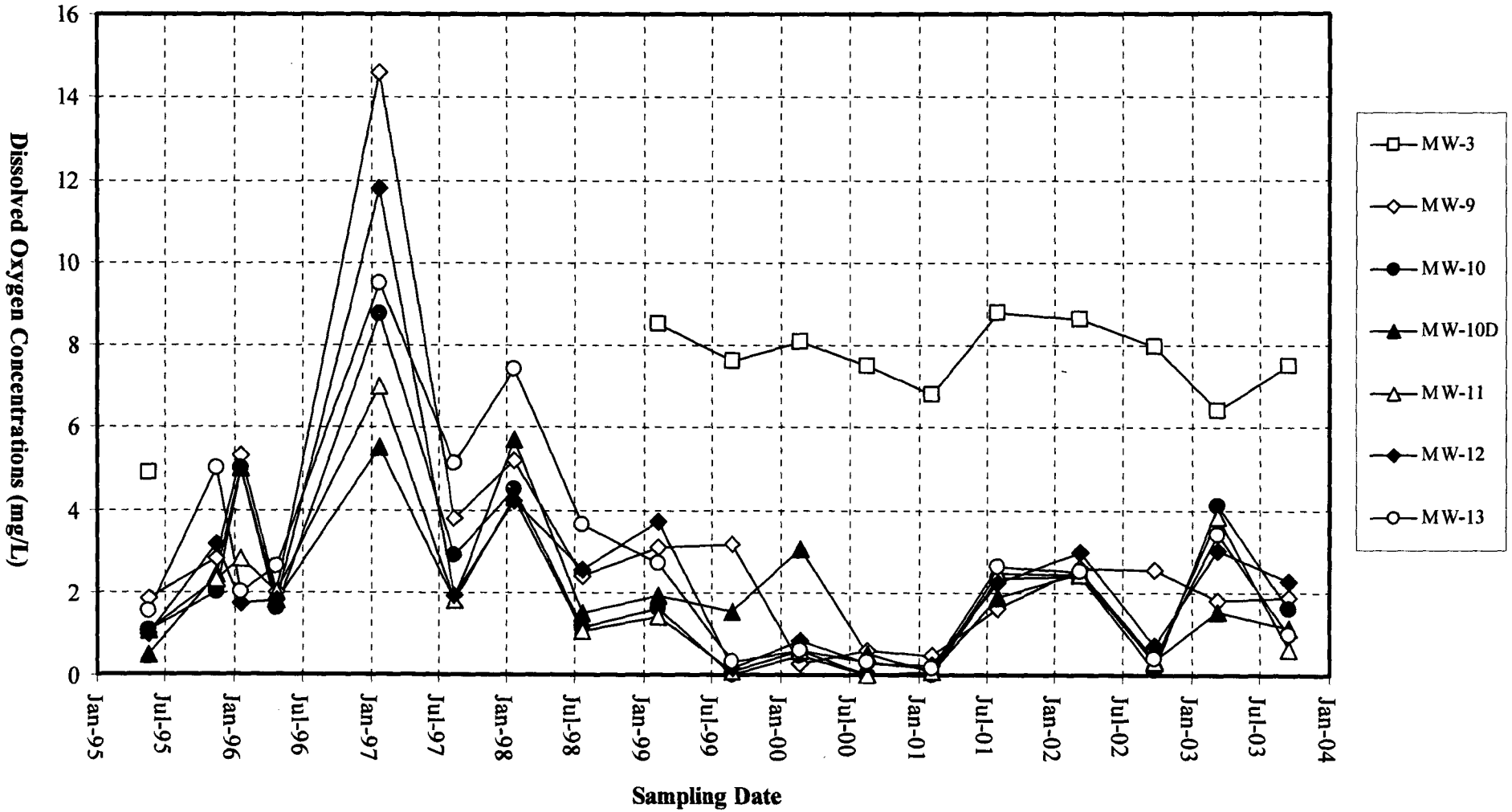


FIGURE 6A
Nitrate Concentrations Versus Time
(WEST SIDE OF PLANT)

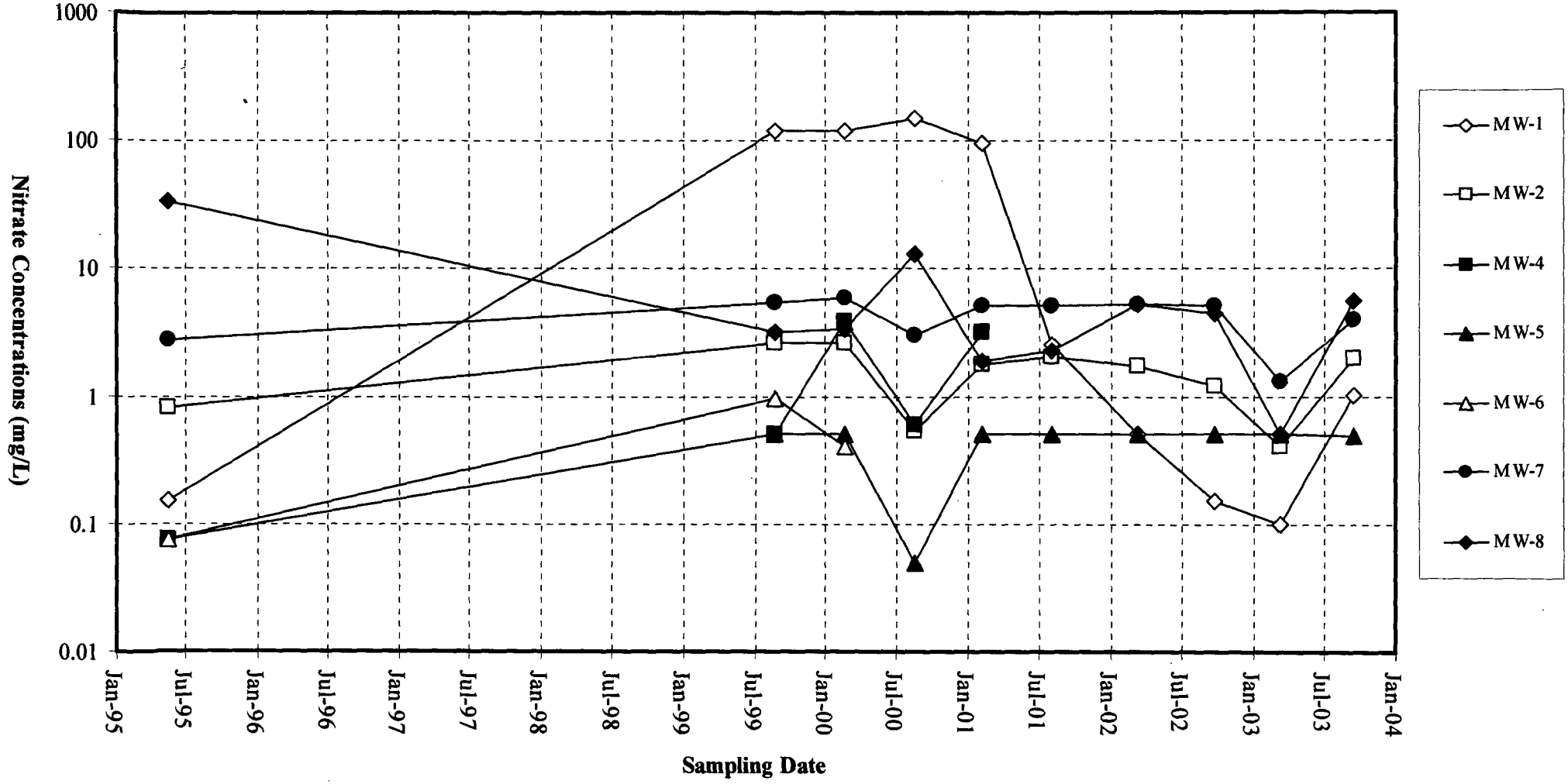


FIGURE 6B
Nitrate Concentrations Versus Time
(EAST SIDE OF PLANT)

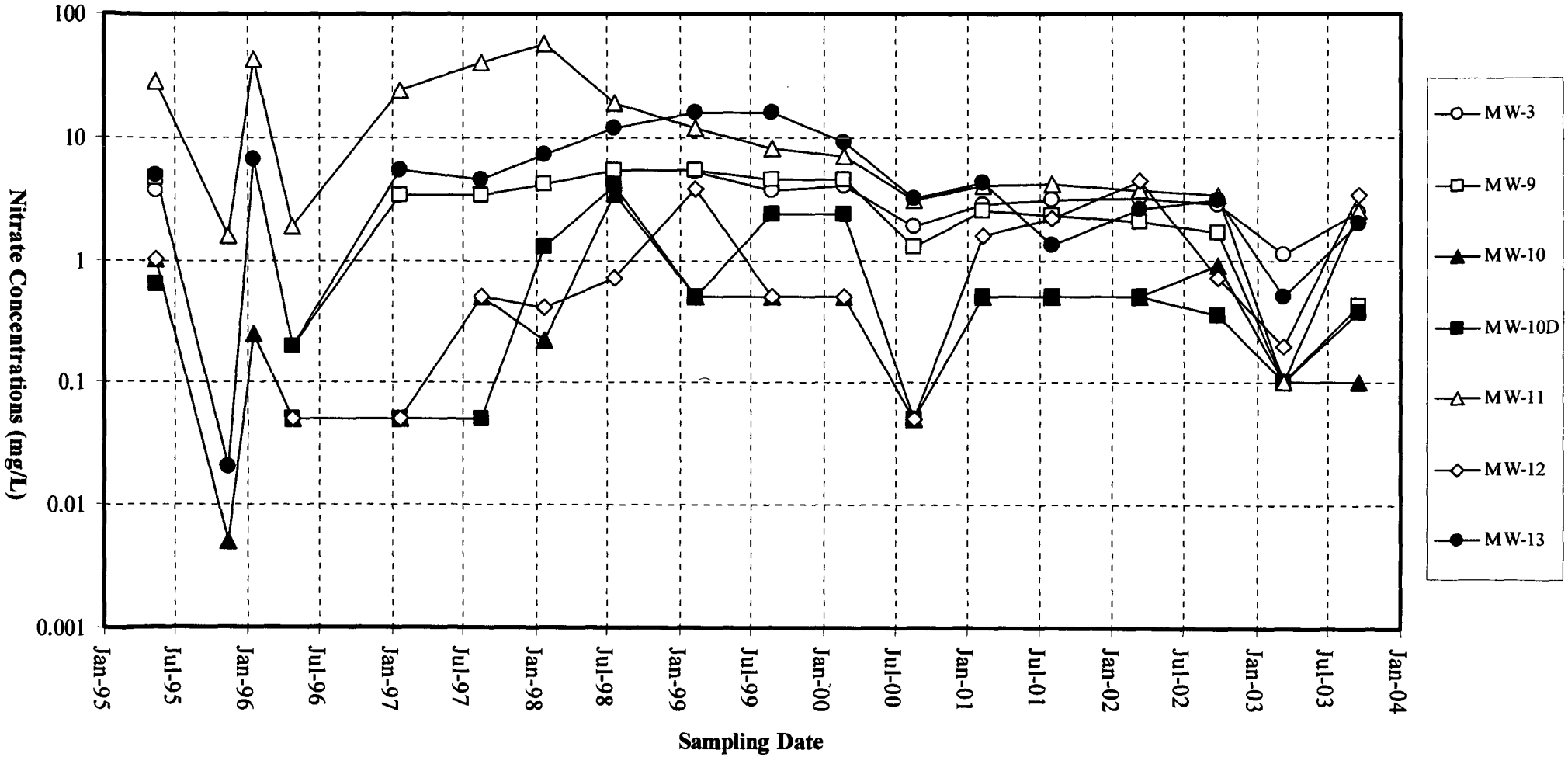


FIGURE 7A
Sulfate Concentrations Versus Time
(WEST SIDE OF PLANT)

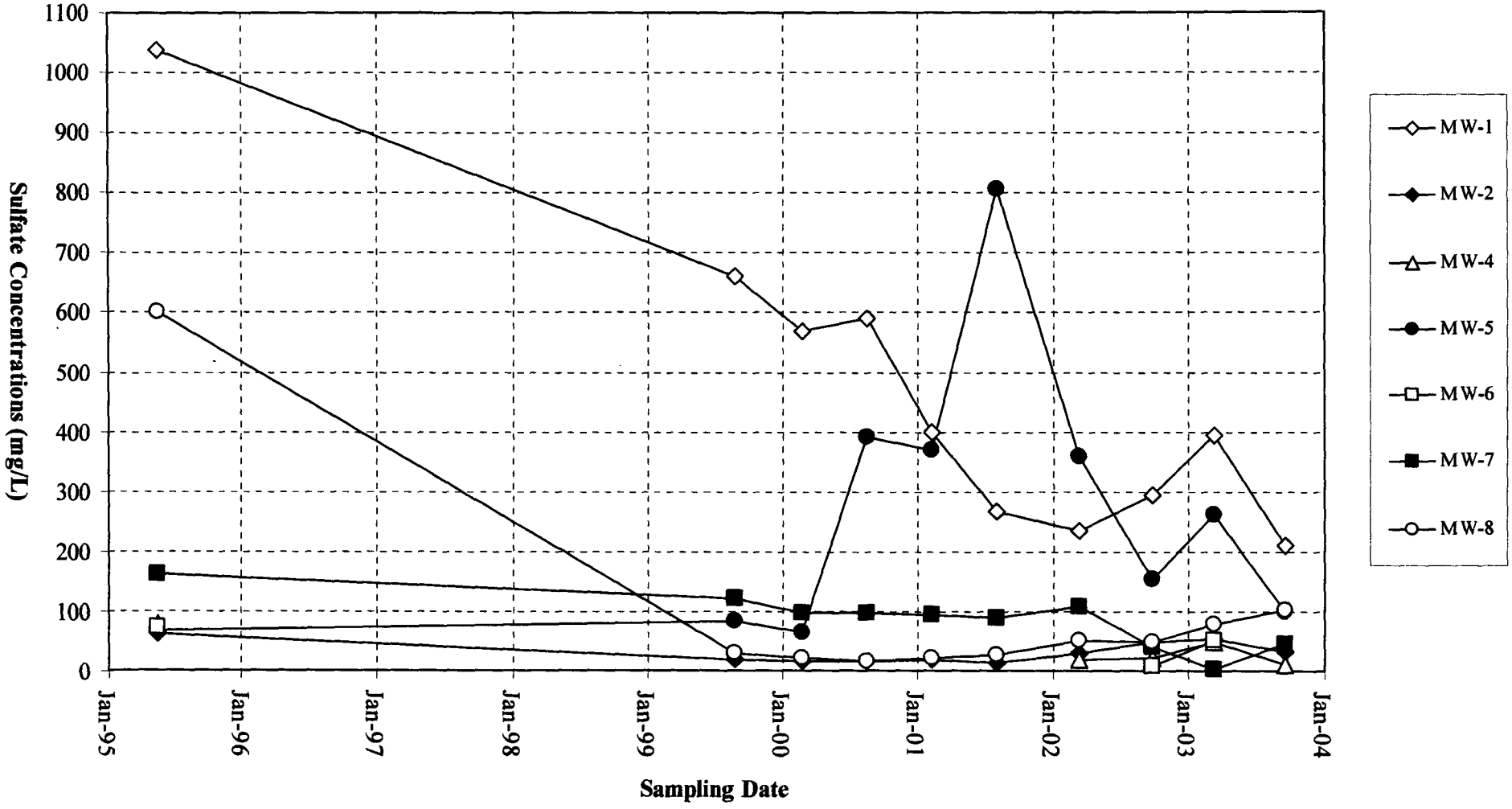


FIGURE 7B
Sulfate Concentrations Versus Time
(EAST SIDE OF PLANT)

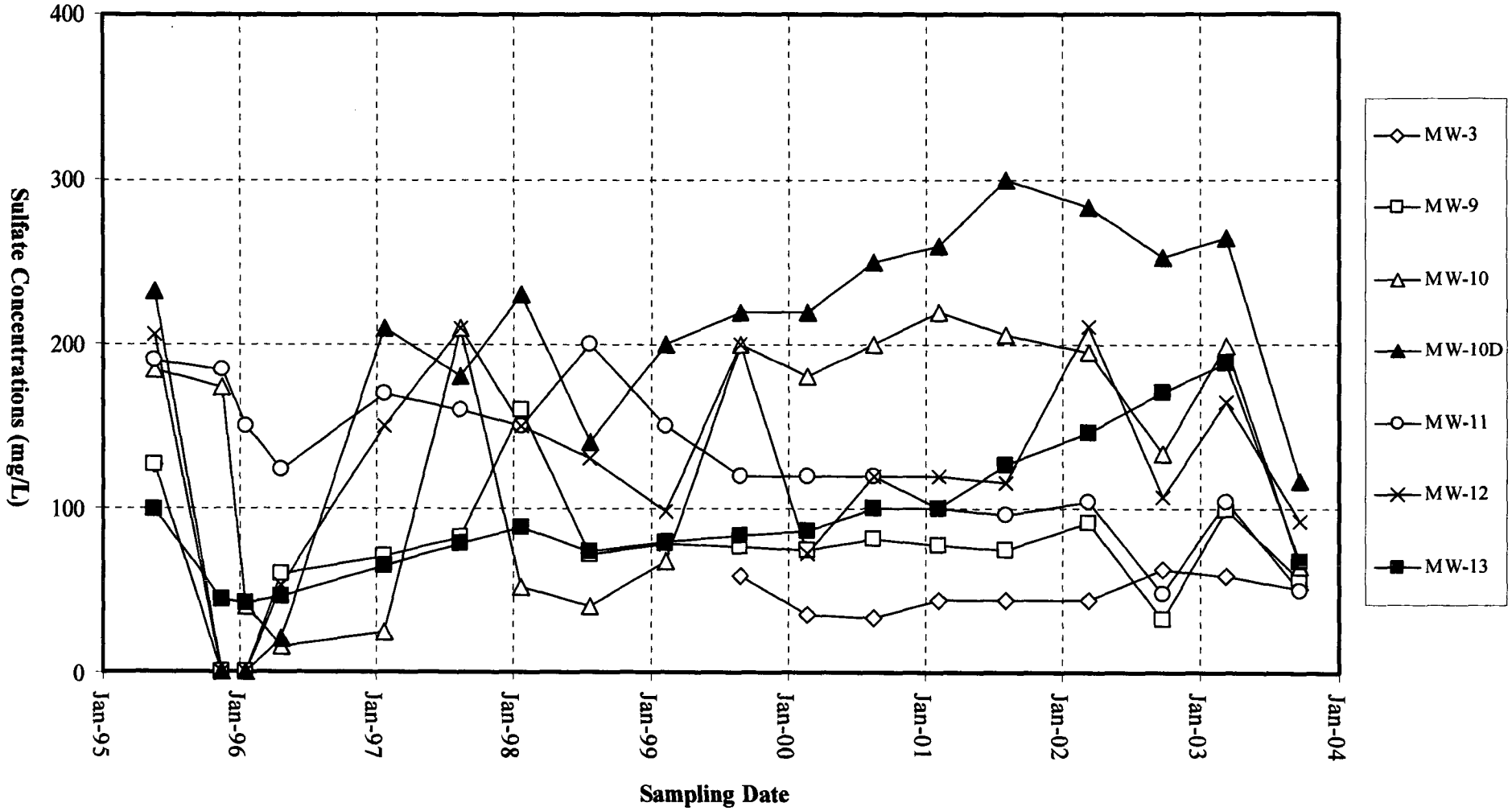


Figure 8A
Benzene and Biological Parameter Concentrations
Versus Distance From Source Area (West Side of Plant)
(September 18, 2003)

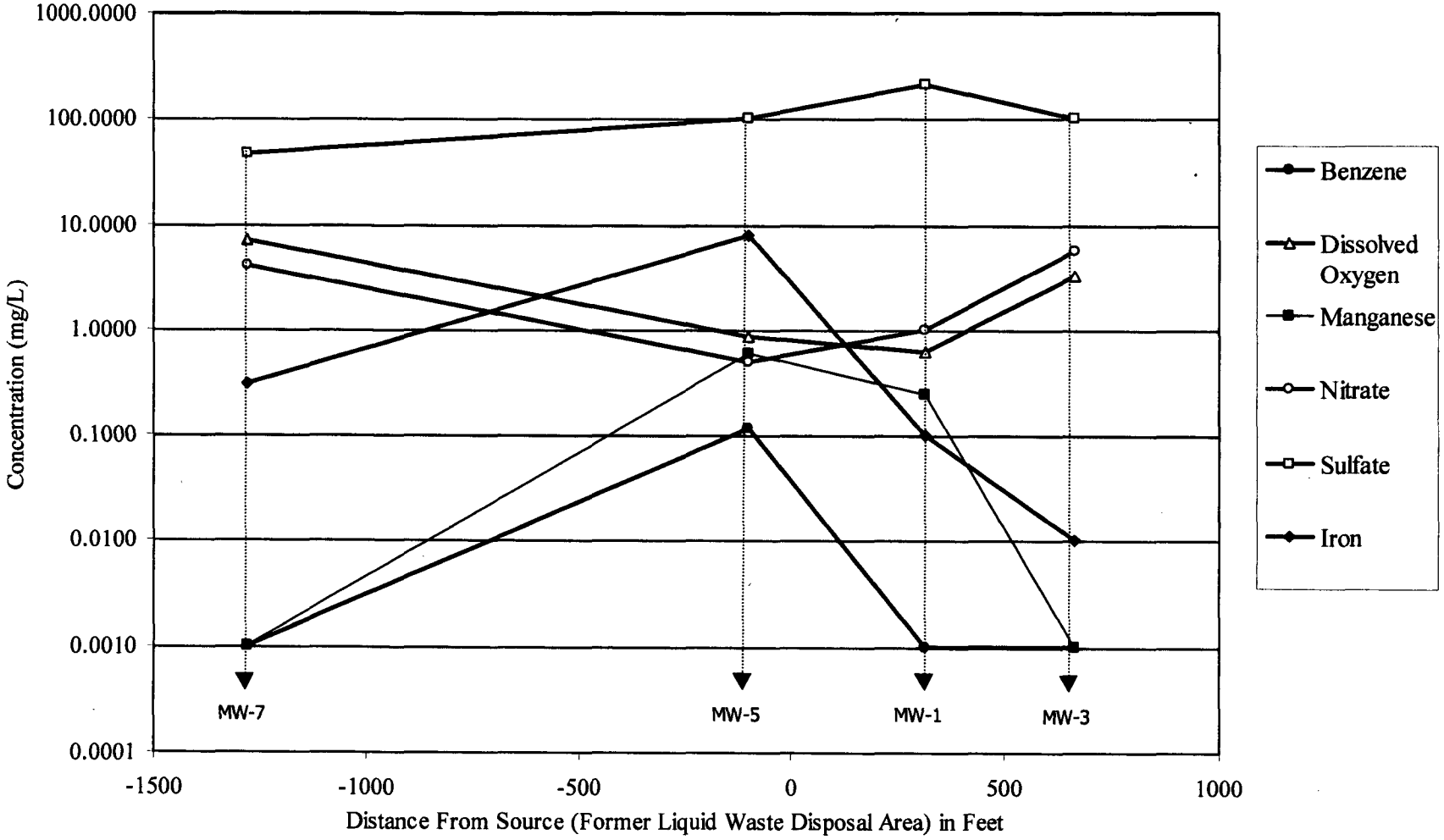


Figure 8B
Benzene and Biological Parameter Concentrations
Versus Distance From Source Area (East Side of Plant)
(September 18, 2003)

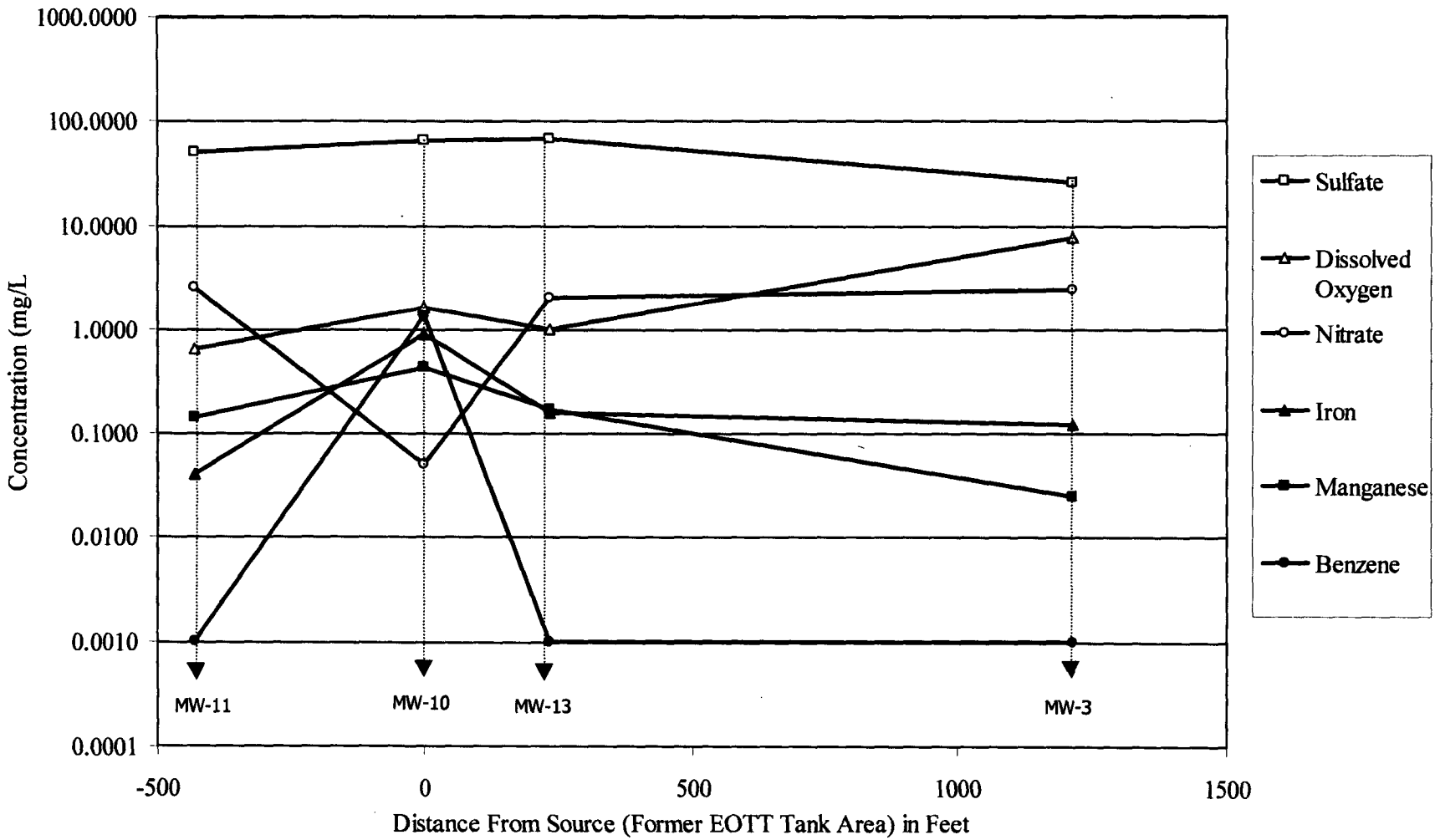


FIGURE 9A
LNAPL Thickness and Recovery Versus Time (MW-4)

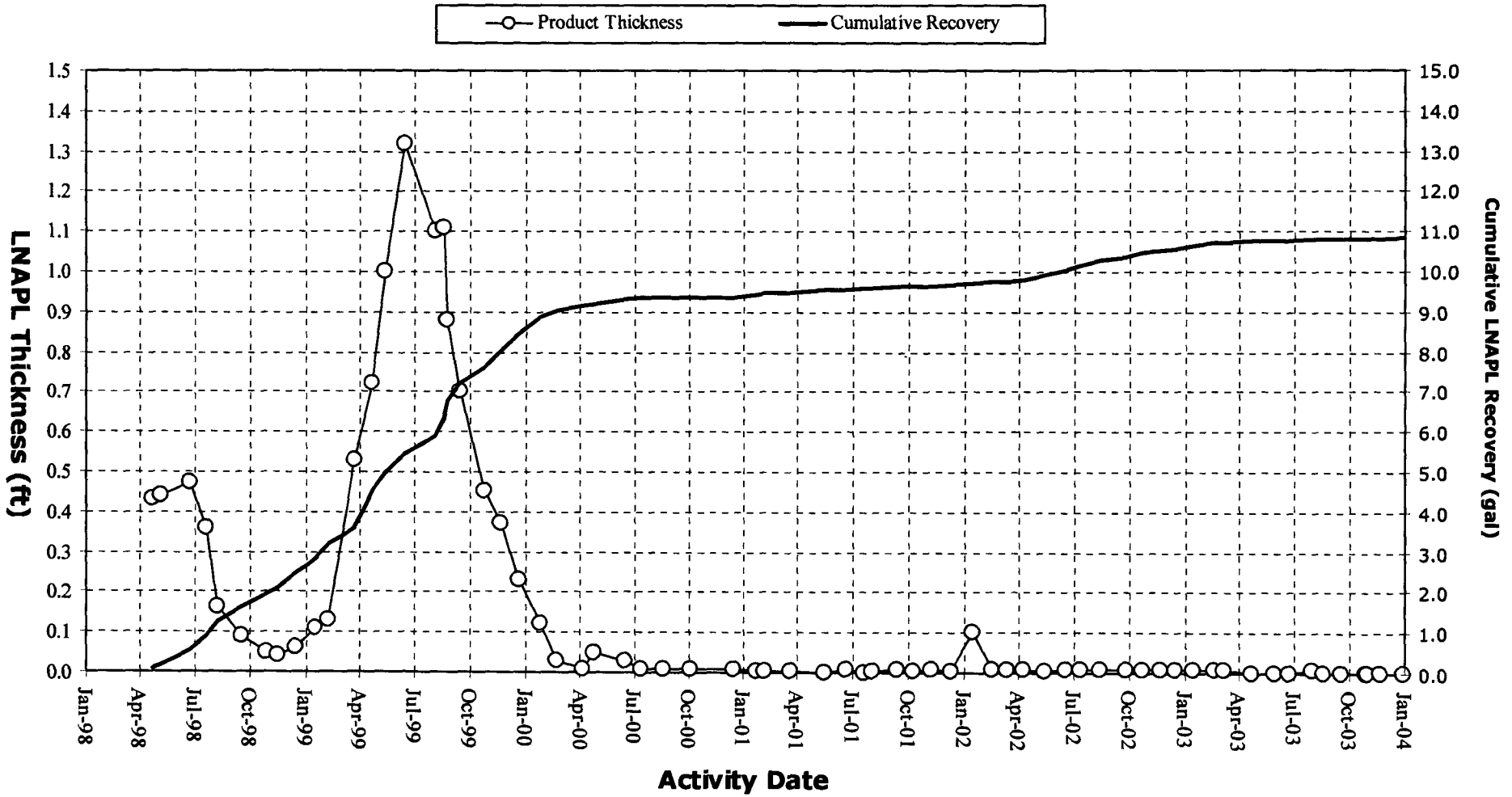
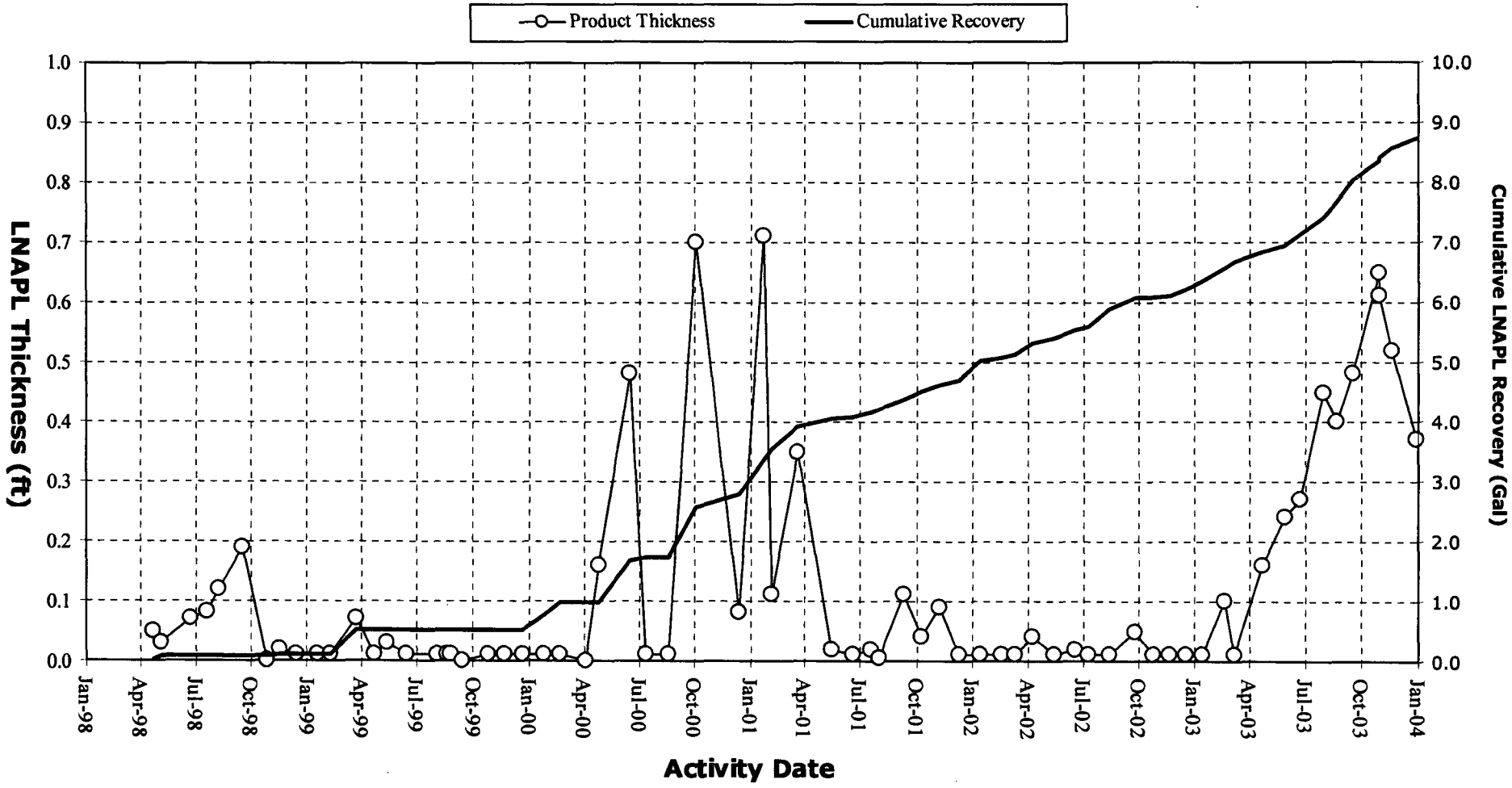


FIGURE 9B

LNAPL Thickness and Recovery Versus Time (MW-6)



TABLES

Table 1

Summary of Purging and Sampling Methods

Duke Energy Field Services – Linam Ranch Gas Plant

Monitoring Well No.	Sample Date	Purge Method	Purge Volume (gallons)	Sampling Method	Groundwater Analytes
MW-1	03/10/03	Pump	15	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Pump	10	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-2	03/10/03	Pump	3	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Bailer	3	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-3	03/10/03	Pump	15	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Pump	6	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-4	03/11/03	Bailer	25	Disposable bailer	BTEX and Bio-indicators
	09/18/03	Bailer	18	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-5	03/11/03	Pump	25	Disposable bailer	BTEX and Bio-indicators
	09/18/03	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-6	03/11/03	Bailer	10	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-7	03/11/03	Bailer	2.5	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Bailer	1.5	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-8	03/11/03	Pump	25	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-9	03/11/03	Pump	12	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Bailer	5	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10	03/10/03	Pump	25	Disposable bailer	BTEX and Bio-indicators
	09/18/03	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10D	03/10/03	Pump	15	Disposable bailer	BTEX and Bio-indicators
	09/18/03	Bailer	12	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-11	03/10/03	Pump	25	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-12	03/10/03	Pump	25	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-13	03/10/03	Pump	25	Disposable bailer	BTEX and Bio-indicators
	09/17/03	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators

BTEX - benzene, toluene, ethylbenzene, xylenes

WQCC Metals - As, Ba, Fe, and Mn

Major ions - TDS, Cl, NO_3, and SO_4

Bio-indicators - DO, NO3, SO4

Monitoring well MW-6 was not sampled in September 2003 due to presence of free product.

Table 2
Summary of Groundwater Elevations
Linam Ranch Gas Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-1	05/22/94	3718.29	3720.18	43.90	3676.28	0.00
	05/17/95	3718.29	3720.18	45.50	3674.68	0.00
	01/17/96	3718.29	3720.18	43.95	3676.23	0.00
	04/24/96	3718.29	3720.18	44.81	3675.37	0.00
	01/22/97	3718.29	3720.18	45.73	3674.45	0.00
	08/15/97	3718.29	3720.18	45.55	3674.63	0.00
	01/22/98	3718.29	3720.18	45.99	3674.19	0.00
	07/20/98	3718.29	3720.18	46.51	3673.67	0.00
	02/09/99	3718.29	3720.18	46.42	3673.76	0.00
	08/24/99	3718.29	3720.18	44.97	3675.21	0.00
	02/21/00	3718.29	3720.18	44.77	3675.41	0.00
	08/17/00	3718.29	3720.18	43.47	3676.71	0.00
	02/06/01	3718.29	3720.18	43.19	3676.99	0.00
	08/02/01	3718.29	3720.18	45.37	3674.81	0.00
	03/11/02	3718.29	3720.18	46.14	3674.04	0.00
	09/25/02	3718.29	3720.18	45.75	3674.43	0.00
	03/08/03	3718.29	3720.18	45.86	3674.32	0.00
	09/17/03	3718.29	3720.18	46.38	3673.80	0.00
MW-2	05/22/94	3714.80	3717.24	34.95	3682.29	0.00
	05/17/95	3714.80	3717.24	43.75	3673.49	0.00
	01/22/97	3714.80	3717.24	44.05	3673.19	0.00
	01/22/98	3714.80	3717.24	44.44	3672.80	0.00
	07/20/98	3714.80	3717.24	44.87	3672.37	0.00
	02/09/99	3714.80	3717.24	44.83	3672.41	0.00
	08/24/99	3714.80	3717.24	42.81	3674.43	0.00
	02/21/00	3714.80	3717.24	44.56	3672.68	0.00
	08/17/00	3714.80	3717.24	37.81	3679.43	0.00
	02/06/01	3714.80	3717.24	43.19	3674.05	0.00
	08/02/01	3714.80	3717.24	44.55	3672.69	0.00
	03/11/02	3714.80	3717.24	45.17	3672.07	0.00
	09/25/02	3714.80	3717.24	44.98	3672.26	0.00
	03/08/03	3714.80	3717.24	45.03	3672.21	0.00
	09/17/03	3714.80	3717.24	45.55	3671.69	0.00
MW-3	05/22/94	3715.50	3717.70	46.23	3671.47	0.00
	05/17/95	3715.50	3717.70	46.98	3670.72	0.00
	11/14/95	3715.50	3717.70	46.40	3671.30	0.00
	04/24/96	3715.50	3717.70	46.57	3671.13	0.00
	01/22/97	3715.50	3717.70	47.23	3670.47	0.00
	01/22/98	3715.50	3717.70	47.74	3669.96	0.00
	07/20/98	3715.50	3717.70	47.90	3669.80	0.00
	02/09/99	3715.50	3717.70	48.11	3669.59	0.00
	08/24/99	3715.50	3717.70	48.02	3669.68	0.00
	02/21/00	3715.50	3717.70	48.19	3669.51	0.00
	08/17/00	3715.50	3717.70	48.02	3669.68	0.00
	02/06/01	3715.50	3717.70	48.22	3669.48	0.00
	08/02/01	3715.50	3717.70	48.39	3669.31	0.00
	03/11/02	3715.50	3717.70	48.56	3669.14	0.00
	09/25/02	3715.50	3717.70	48.67	3669.03	0.00
	03/08/03	3715.50	3717.70	48.64	3669.06	0.00
	09/17/03	3715.50	3717.70	48.83	3668.87	0.00

Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Gas Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-4	12/01/92	3720.46	3722.45	45.35	3677.10	0.00
	05/22/94	3720.46	3722.45	45.49	3676.96	0.00
	05/17/95	3720.46	3722.45	47.20	3675.43	0.22
	11/15/95	3720.46	3722.45	46.71	3675.75	0.01
	01/17/96	3720.46	3722.45	46.18	3676.27	0.00
	04/24/96	3720.46	3722.45	46.95	3675.50	0.00
	01/22/97	3720.46	3722.45	48.19	3674.29	0.04
	08/15/97	3720.46	3722.45	48.55	3674.12	0.27
	01/22/98	3720.46	3722.45	49.11	3674.52	1.44
	07/20/98	3720.46	3722.45	48.99	3673.76	0.36
	02/09/99	3720.46	3722.45	48.11	3674.45	0.13
	08/24/99	3720.46	3722.45	47.73	3675.44	0.88
	02/21/00	3720.46	3722.45	46.66	3675.81	0.03
	08/17/00	3720.46	3722.45	46.39	3676.07	0.01
	02/06/01	3720.46	3722.45	47.06	3675.39	0.01
	08/02/01	3720.46	3722.45	47.66	3674.80	0.01
	03/11/02	3720.46	3722.45	47.86	3674.59	<0.01
	09/25/02	3720.46	3722.45	47.33	3675.13	0.01
	03/08/03	3720.46	3722.45	47.85	3674.60	<0.01
	09/17/03	3720.46	3722.45	48.29	3674.16	0.00
MW-5	12/01/92	3721.53	3723.60	45.95	3677.65	0.00
	05/22/94	3721.53	3723.60	46.27	3677.33	0.00
	05/17/95	3721.53	3723.60	48.17	3675.43	0.01
	11/15/95	3721.53	3723.60	46.98	3676.62	0.00
	01/17/96	3721.53	3723.60	47.37	3676.23	0.00
	04/24/96	3721.53	3723.60	48.09	3675.51	0.00
	01/22/97	3721.53	3723.60	49.25	3674.35	0.00
	08/15/97	3721.53	3723.60	49.64	3673.96	0.00
	01/22/98	3721.53	3723.60	48.86	3674.74	0.00
	07/20/98	3721.53	3723.60	49.39	3674.21	0.00
	02/09/99	3721.53	3723.60	48.76	3674.84	0.00
	08/24/99	3721.53	3723.60	48.13	3675.47	0.00
	02/21/00	3721.53	3723.60	47.76	3675.84	0.00
	08/17/00	3721.53	3723.60	47.94	3675.66	0.00
	02/06/01	3721.53	3723.60	48.36	3675.24	0.00
	08/02/01	3721.53	3723.60	48.78	3674.82	0.00
	03/11/02	3721.53	3723.60	48.53	3675.07	0.00
	09/25/02	3721.53	3723.60	48.61	3674.99	0.00
	03/08/03	3721.53	3723.60	48.79	3674.81	0.00
	09/17/03	3721.53	3723.60	49.28	3674.32	0.00
MW-6	12/01/92	3720.99	3723.08	46.21	3676.87	0.00
	05/22/94	3720.99	3723.08	46.38	3676.70	0.00
	05/17/95	3720.99	3723.08	48.25	3674.87	0.05
	11/15/95	3720.99	3723.08	46.29	3676.80	0.01
	01/17/96	3720.99	3723.08	46.90	3676.18	0.00
	04/24/96	3720.99	3723.08	46.72	3676.37	0.01
	01/22/97	3720.99	3723.08	48.89	3674.21	0.02
	08/15/97	3720.99	3723.08	49.21	3673.91	0.05
	01/22/98	3720.99	3723.08	48.91	3674.21	0.05
	07/20/98	3720.99	3723.08	49.56	3673.59	0.08
	02/09/99	3720.99	3723.08	49.24	3673.84	0.00
	08/24/99	3720.99	3723.08	48.22	3674.86	0.00

Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Gas Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-6	02/21/00	3720.99	3723.08	47.97	3675.11	0.00
	08/17/00	3720.99	3723.08	47.48	3675.61	0.01
	02/06/01	3720.99	3723.08	48.42	3674.75	0.11
	08/02/01	3720.99	3723.08	48.94	3674.15	0.01
	03/11/02	3720.99	3723.08	48.79	3674.30	0.01
	09/25/02	3720.99	3723.08	48.48	3674.61	0.01
	03/08/03	3720.99	3723.08	48.96	3674.12	<0.01
	09/17/03	3720.99	3723.08	49.92	3673.55	0.48
MW-7	05/22/94	3728.57	3730.84	54.52	3676.32	0.00
	05/17/95	3728.57	3730.84	57.00	3673.84	0.00
	11/14/95	3728.57	3730.84	57.95	3672.89	0.00
	04/24/96	3728.57	3730.84	58.00	3672.84	0.00
	01/22/97	3728.57	3730.84	57.71	3673.13	0.00
	01/22/98	3728.57	3730.84	57.57	3673.27	0.00
	02/09/99	3728.57	3730.84	57.29	3673.55	0.00
	08/24/99	3728.57	3730.84	57.64	3673.20	0.00
	02/21/00	3728.57	3730.84	57.39	3673.45	0.00
	08/17/00	3728.57	3730.84	57.26	3673.58	0.00
	02/06/01	3728.57	3730.84	56.66	3674.18	0.00
	08/02/01	3728.57	3730.84	58.15	3672.69	0.00
	03/11/02	3728.57	3730.84	56.77	3674.07	0.00
	09/25/02	3728.57	3730.84	57.41	3673.43	0.00
	03/08/03	3728.57	3730.84	57.41	3673.43	0.00
	09/17/03	3728.57	3730.84	59.35	3671.49	0.00
MW-8	05/22/94	3714.18	3716.18	41.35	3674.83	0.00
	05/17/95	3714.18	3716.18	43.45	3672.73	0.00
	01/17/96	3714.18	3716.18	41.71	3674.47	0.00
	04/24/96	3714.18	3716.18	42.82	3673.36	0.00
	01/22/97	3714.18	3716.18	43.40	3672.78	0.00
	08/15/97	3714.18	3716.18	44.14	3672.04	0.00
	01/22/98	3714.18	3716.18	44.31	3671.87	0.00
	07/20/98	3714.18	3716.18	44.57	3671.61	0.00
	02/09/99	3714.18	3716.18	44.70	3671.48	0.00
	08/24/99	3714.18	3716.18	43.62	3672.56	0.00
	02/21/00	3714.18	3716.18	44.25	3671.93	0.00
	08/17/00	3714.18	3716.18	41.52	3674.66	0.00
	02/06/01	3714.18	3716.18	43.58	3672.60	0.00
	08/02/01	3714.18	3716.18	44.92	3671.26	0.00
	03/11/02	3714.18	3716.18	44.67	3671.51	0.00
	09/25/02	3714.18	3716.18	44.59	3671.59	0.00
	03/08/03	3714.18	3716.18	44.59	3671.59	0.00
	09/17/03	3714.18	3716.18	45.47	3670.71	0.00
MW-9	05/22/94	3720.48	3722.48	49.59	3672.89	0.00
	05/17/95	3720.48	3722.48	50.60	3671.88	0.00
	11/14/95	3720.48	3722.48	50.02	3672.46	0.00
	01/17/96	3720.48	3722.48	49.84	3672.64	0.00
	04/24/96	3720.48	3722.48	50.08	3672.40	0.00
	02/07/97	3720.48	3722.48	50.96	3671.52	0.00
	08/15/97	3720.48	3722.48	51.34	3671.14	0.00
	01/22/98	3720.48	3722.48	51.48	3671.00	0.00
	07/20/98	3720.48	3722.48	51.58	3670.90	0.00
	02/09/99	3720.48	3722.48	51.81	3670.67	0.00
	08/24/99	3720.48	3722.48	51.59	3670.89	0.00

Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Gas Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-9	02/21/00	3720.48	3722.48	51.70	3670.78	0.00
	08/17/00	3720.48	3722.48	51.56	3670.92	0.00
	02/06/01	3720.48	3722.48	51.62	3670.86	0.00
	08/02/01	3720.48	3722.48	51.86	3670.62	0.00
	03/11/02	3720.48	3722.48	51.87	3670.61	0.00
	09/25/02	3720.48	3722.48	51.87	3670.61	0.00
	03/08/03	3720.48	3722.48	51.80	3670.68	0.00
	09/17/03	3720.48	3722.48	52.00	3670.48	0.00
MW-10	05/17/95	3720.76	3722.90	50.45	3672.45	0.00
	11/14/95	3720.76	3722.90	49.85	3673.05	0.00
	01/17/96	3720.76	3722.90	49.82	3673.08	0.00
	04/24/96	3720.76	3722.90	50.15	3672.75	0.00
	02/07/97	3720.76	3722.90	51.12	3671.78	0.00
	08/15/97	3720.76	3722.90	51.49	3671.41	0.00
	01/22/98	3720.76	3722.90	51.57	3671.33	0.00
	07/20/98	3720.76	3722.90	51.68	3671.22	0.00
	02/09/99	3720.76	3722.90	51.88	3671.02	0.00
	08/24/99	3720.76	3722.90	51.51	3671.39	0.00
	02/21/00	3720.76	3722.90	51.66	3671.24	0.00
	08/17/00	3720.76	3722.90	51.37	3671.53	0.00
	02/06/01	3720.76	3722.90	51.54	3671.36	0.00
	08/02/01	3720.76	3722.90	51.84	3671.06	0.00
	03/11/02	3720.76	3722.90	51.80	3671.10	0.00
	09/25/02	3720.76	3722.90	51.77	3671.13	0.00
	03/08/03	3720.76	3722.90	51.73	3671.17	0.00
	09/17/03	3720.76	3722.90	52.03	3670.87	0.00
MW-10D	05/17/95	3720.85	3723.54	51.38	3672.16	0.00
	11/14/95	3720.85	3723.54	50.63	3672.91	0.00
	01/17/96	3720.85	3723.54	50.73	3672.81	0.00
	04/24/96	3720.85	3723.54	51.18	3672.36	0.00
	02/07/97	3720.85	3723.54	52.11	3671.43	0.00
	08/15/97	3720.85	3723.54	52.47	3671.07	0.00
	01/22/98	3720.85	3723.54	52.41	3671.13	0.00
	07/20/98	3720.85	3723.54	52.55	3670.99	0.00
	02/09/99	3720.85	3723.54	52.76	3670.78	0.00
	08/24/99	3720.85	3723.54	52.51	3671.03	0.00
	02/21/00	3720.85	3723.54	52.56	3670.98	0.00
	08/17/00	3720.85	3723.54	52.25	3671.29	0.00
	02/06/01	3720.85	3723.54	52.57	3670.97	0.00
	08/02/01	3720.85	3723.54	52.78	3670.76	0.00
	03/11/02	3720.85	3723.54	52.70	3670.84	0.00
	09/25/02	3720.85	3723.54	52.73	3670.81	0.00
	03/08/03	3720.85	3723.54	52.69	3670.85	0.00
	09/17/03	3720.85	3723.54	53.08	3670.46	0.00
MW-11	05/17/95	3722.02	3724.53	51.50	3673.03	0.00
	11/14/95	3722.02	3724.53	50.34	3674.19	0.00
	01/17/96	3722.02	3724.53	50.65	3673.88	0.00
	04/24/96	3722.02	3724.53	51.22	3673.31	0.00
	02/07/97	3722.02	3724.53	52.32	3672.21	0.00
	08/15/97	3722.02	3724.53	52.72	3671.81	0.00
	01/22/98	3722.02	3724.53	52.52	3672.01	0.00
	07/20/98	3722.02	3724.53	52.65	3671.88	0.00
	02/09/99	3722.02	3724.53	52.85	3671.68	0.00

Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Gas Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-11	08/24/99	3722.02	3724.53	52.47	3672.06	0.00
	02/21/00	3722.02	3724.53	52.44	3672.09	0.00
	08/17/00	3722.02	3724.53	52.06	3672.47	0.00
	02/06/01	3722.02	3724.53	52.31	3672.22	0.00
	08/02/01	3722.02	3724.53	52.74	3671.79	0.00
	03/11/02	3722.02	3724.53	52.51	3672.02	0.00
	09/25/02	3722.02	3724.53	52.48	3672.05	0.00
	03/08/03	3722.02	3724.53	52.53	3672.00	0.00
	09/17/03	3722.02	3724.53	53.04	3671.49	0.00
MW-12	05/17/95	3720.60	3722.84	50.47	3672.37	0.00
	11/14/95	3720.60	3722.84	49.52	3673.32	0.00
	01/17/96	3720.60	3722.84	49.59	3673.25	0.00
	04/24/96	3720.60	3722.84	50.09	3672.75	0.00
	02/07/97	3720.60	3722.84	51.10	3671.74	0.00
	08/15/97	3720.60	3722.84	51.44	3671.40	0.00
	01/22/98	3720.60	3722.84	51.50	3671.34	0.00
	07/20/98	3720.60	3722.84	51.66	3671.18	0.00
	02/09/99	3720.60	3722.84	51.84	3671.00	0.00
	08/24/99	3720.60	3722.84	51.25	3671.59	0.00
	02/21/00	3720.60	3722.84	51.51	3671.33	0.00
	08/17/00	3720.60	3722.84	50.98	3671.86	0.00
	02/06/01	3720.60	3722.84	51.34	3671.50	0.00
	08/02/01	3720.60	3722.84	51.77	3671.07	0.00
	03/11/02	3720.60	3722.84	51.83	3671.01	0.00
	09/25/02	3720.60	3722.84	51.75	3671.09	0.00
	03/08/03	3720.60	3722.84	51.69	3671.15	0.00
	09/17/03	3720.60	3722.84	52.03	3670.81	0.00
MW-13	05/17/95	3721.63	3723.99	51.97	3672.02	0.00
	11/14/95	3721.63	3723.99	51.42	3672.57	0.00
	01/17/96	3721.63	3723.99	51.33	3672.66	0.00
	04/24/96	3721.63	3723.99	51.65	3672.34	0.00
	02/07/97	3721.63	3723.99	52.56	3671.43	0.00
	08/15/97	3721.63	3723.99	52.94	3671.05	0.00
	01/22/98	3721.63	3723.99	53.06	3670.93	0.00
	07/20/98	3721.63	3723.99	53.19	3670.80	0.00
	02/09/99	3721.63	3723.99	53.39	3670.60	0.00
	08/24/99	3721.63	3723.99	53.05	3670.94	0.00
	02/21/00	3721.63	3723.99	53.25	3670.74	0.00
	08/17/00	3721.63	3723.99	52.95	3671.04	0.00
	02/06/01	3721.63	3723.99	53.11	3670.88	0.00
	08/02/01	3721.63	3723.99	53.41	3670.58	0.00
	03/11/02	3721.63	3723.99	53.49	3670.50	0.00
	09/25/02	3721.63	3723.99	53.49	3670.50	0.00
	03/08/03	3721.63	3723.99	53.42	3670.57	0.00
	09/17/03	3721.63	3723.99	53.67	3670.32	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.0028 feet/foot.

Table 3
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	09/20/91	0.0053	0.0067	0.001	<0.001
	11/03/92	0.0015	0.0015	<0.001	0.010
	12/02/92	0.0013	0.0014	<0.001	0.006
	01/12/94	0.0039	<0.001	0.0021	0.002
	05/17/95	<0.002	<0.002	<0.002	<0.002
	08/25/99	<0.005	<0.005	<0.005	0.006
	02/22/00	<0.005	<0.005	<0.005	0.006
	08/18/00	<0.001	<0.001	<0.001	0.011
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.003	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.005	<0.005	<0.005	<0.005
	03/10/03	<0.001	<0.001	<0.001	<0.001
	09/17/03	<0.001	<0.001	<0.001	<0.001
MW-2	09/20/91	<0.001	<0.001	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	<0.001	<0.001	<0.001	<0.001
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.007	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
	03/10/03	<0.001	<0.001	<0.001	<0.001
	09/17/03	<0.001	<0.001	<0.001	<0.001
MW-3	09/20/91	<0.001	0.0021	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	02/09/99	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/17/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.002	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
	03/10/03	<0.001	<0.001	<0.001	<0.001
	09/17/03	<0.001	<0.001	<0.001	<0.001
MW-4	11/03/92	**16.0**	**8.0**	0.7	**1.8**
	12/02/92	**17.0**	**8.2**	0.53	**1.3**
	01/10/94	**18.0**	**10.0**	0.5	**1.3**
	05/17/95	**20.9**	**1.35**	<0.2	**11.4**
	03/12/02	**17.9**	<0.100	0.450	0.166
	09/25/02	**18.8**	<0.100	0.526	<0.100
	03/11/03	**16.9**	<0.100	0.520	0.151
	09/18/03	**15.8**	<0.200	0.259	<0.200

Table 3 (Continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-5	11/03/92	0.003	0.0034	0.003	0.034
	12/02/92	0.0091	0.0041	0.0082	0.037
	01/10/94	**0.300**	0.190	0.160	0.490
	05/17/95	**0.090**	0.014	0.138	**0.831**
	08/25/99	**0.137**	0.037	0.262	0.179
	02/23/00	**0.068**	<0.005	0.13	0.09
	08/18/00	<0.005	<0.005	0.006	0.008
	02/08/01	<0.005	<0.005	0.084	<0.005
	08/03/01	<0.005	<0.005	<0.005	<0.005
	03/12/02	**0.062**	<0.001	0.097	<0.001
	09/26/02	**0.381**	<0.050	0.588	0.112
	03/11/03	**0.079**	<0.050	0.072	<0.050
	09/18/03	**0.116**	<0.001	0.182	<0.001
MW-6	11/03/92	**0.340**	0.023	0.051	0.120
	12/02/92	**0.520**	0.020	0.058	0.120
	01/10/94	**0.770**	0.0029	0.096	0.210
	05/17/95	**0.980**	0.007	0.087	0.181
	09/25/02	**1.29**	<0.050	0.134	0.058
	03/11/03	**0.155**	<0.100	0.148	<0.100
MW-7	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/17/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	<0.005	<0.005	<0.005	<0.005
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/26/02	<0.005	<0.005	<0.005	<0.005
	03/11/03	<0.005	<0.005	<0.005	<0.005
	09/17/03	<0.001	<0.001	<0.001	<0.001
MW-8	02/09/94	<0.001	<0.005	<0.005	<0.005
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	0.002	<0.001	<0.001	<0.001
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	<0.001	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
	03/11/03	<0.001	<0.001	<0.001	<0.001
	09/17/03	<0.005	<0.005	<0.005	<0.005
MW-9	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	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
	08/15/97	<0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/20/98	<0.001	<0.001	<0.001	<0.001
	02/09/99	**0.011**	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	**0.014**	<0.005	<0.005	<0.005

Table 3 (Continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-9	08/18/00	**0.036**	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	**0.038**	<0.001	<0.001	<0.001
	03/10/03	**0.048**	<0.001	<0.001	<0.001
	09/25/02	**0.071**	<0.001	<0.001	0.002
	03/11/02	**0.077**	<0.001	<0.001	0.003
	09/18/03	<0.005	<0.005	<0.005	<0.005
MW-10	05/17/95	**3.225**	0.052	0.049	0.169
	11/14/95	**5.230**	0.001	<0.001	0.406
	01/17/96	**6.110**	**0.863**	**1.140**	**1.050**
	04/24/96	**6.940**	<0.010	**1.190**	0.127
	01/22/97	**6.41**	**1.63**	0.294	**8.97**
	08/15/97	**5.63**	**1.35**	0.479	**0.453**
	01/22/98	**7.03**	**1.93**	**0.802**	**0.635**
	07/22/98	**7.18**	**2.34**	**0.777**	0.606
	02/09/99	**4.87**	0.32	0.516	0.372
	08/25/99	**5.58**	0.658	0.557	0.359
	02/23/00	**2.35**	0.129	0.164	0.124
	08/18/00	**3.11**	0.025	0.072	0.038
	02/08/01	**1.23**	0.082	0.102	0.086
	08/03/01	**1.64**	<0.02	0.119	<0.02
	03/12/02	**3.26**	0.178	0.251	0.550
	09/26/02	**3.48**	<0.100	0.290	0.155
	03/10/03	**4.21**	<0.100	0.303	<0.100
	09/18/03	**1.34**	0.006	0.110	0.044
MW-10D	05/17/95	**0.096**	0.004	<0.001	0.008
	11/14/95	**0.125**	0.001	<0.001	0.011
	01/17/96	**0.841**	0.001	<0.001	0.047
	04/24/96	**8.140**	0.046	**1.170**	0.076
	01/22/97	**0.365**	<0.005	<0.005	<0.005
	08/15/97	**0.221**	<0.01	<0.01	<0.01
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	**0.184**	0.014	0.008	0.006
	02/09/99	0.009	<0.005	<0.005	<0.005
	08/25/99	**0.036**	<0.001	0.001	0.002
	02/23/00	**0.014**	<0.005	<0.005	<0.005
	08/18/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/03/01	<0.001	<0.001	<0.001	<0.001
	03/12/02	0.002	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
	03/10/03	<0.005	<0.005	<0.005	<0.005
	09/18/03	<0.005	<0.005	<0.005	<0.005
MW-11	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	**0.306**	<0.001	<0.001	0.013
	01/17/96	**0.549**	0.004	0.002	0.031
	04/24/96	**0.520**	<0.002	<0.002	<0.002
	01/22/97	**0.267**	<0.001	<0.001	0.017
	08/15/97	**0.164**	<0.001	0.002	0.007
	01/22/98	**0.291**	0.004	<0.001	0.015
	07/22/98	**0.061**	<0.001	<0.001	0.010
	02/09/99	**0.018**	<0.001	<0.001	<0.001
	08/24/99	0.005	<0.001	<0.001	<0.001

Table 3 (Continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-11	02/23/00	**0.02**	<0.001	0.002	0.008
	08/18/00	0.009	<0.005	<0.005	<0.005
	02/07/01	**0.013**	<0.001	<0.001	<0.001
	08/03/01	0.002	<0.001	<0.001	<0.001
	03/12/02	0.005	<0.001	<0.001	<0.001
	09/26/02	0.002	<0.001	<0.001	<0.001
	03/10/03	<0.001	<0.001	<0.001	<0.001
	09/17/03	<0.005	<0.005	<0.005	<0.005
MW-12	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	<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
	08/15/97	0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	0.002	<0.001	<0.001	<0.001
	02/09/99	0.001	<0.001	<0.001	<0.001
	08/24/99	0.003	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/18/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.001	<0.001	<0.001	<0.001
	08/03/01	<0.001	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001
	09/26/02	<0.001	<0.001	<0.001	<0.001
	03/10/03	<0.001	<0.001	<0.001	<0.001
	09/17/03	<0.005	<0.005	<0.005	<0.005
MW-13	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	0.003	<0.001	0.001	<0.001
	01/17/96	<0.001	<0.001	<0.001	<0.001
	04/24/96	<0.001	<0.001	<0.001	<0.001
	01/22/97	**0.048**	<0.001	<0.001	<0.001
	08/15/97	**0.132**	<0.001	<0.001	0.005
	01/22/98	**0.082**	<0.001	<0.001	<0.001
	07/20/98	**0.061**	<0.001	<0.001	<0.001
	02/09/99	**0.082**	<0.001	<0.001	<0.001
	08/24/99	**0.062**	<0.001	<0.001	<0.001
	02/23/00	**0.08**	<0.001	<0.001	<0.001
	08/18/00	**0.04**	<0.005	<0.005	<0.005
	02/07/01	**0.023**	<0.005	<0.005	<0.005
	08/03/01	0.002	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001
	09/26/02	<0.001	<0.001	<0.001	<0.001
	03/10/03	<0.001	<0.001	<0.001	<0.001
	09/17/03	<0.005	<0.005	<0.005	<0.005
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 8021 except for samples obtained on May 17, 1995 (EPA Method 8240).

New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.

Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 4
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Gas Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-1	05/17/95	<0.01	**62.67**	**0.2**	0.8	**0.02**	**0.46**	**30.76**	**0.56**	188	**2,204**
	08/24/99	<0.01	<0.2	0.08	<0.05	<0.01	0.01	<0.05	**0.22**	110	**2,400**
	08/18/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	160	**2,700**
	08/02/01	<0.0125	0.286	**0.197**	<0.1	<0.025	<0.01	<0.05	0.194	80.6	**1,120**
	09/25/02	<0.0125	<0.100	**0.616**	0.258	<0.005	<0.01	<0.05	0.164	80	**1,251**
	09/17/03	---	---	**0.117**	0.053	---	---	0.099	0.242	54.9	**1,410**
MW-2	05/17/95	**0.77**	0.16	<0.1	0.41	<0.01	0.02	0.34	**0.41**	6	378
	08/24/99	<0.01	1.0	<0.05	0.13	**0.01**	0.01	0.73	0.03	31	290
	08/17/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	11	300
	08/02/01	<0.0125	0.262	<0.05	0.169	<0.025	<0.01	<0.05	<0.025	45.7	412
	09/25/02	<0.0125	0.158	<0.05	0.910	<0.005	<0.01	0.090	<0.025	68	398
	09/17/03	---	---	<0.01	0.197	---	---	<0.05	<0.025	16.5	477
MW-3	05/17/95	**0.23**	**13.48**	<0.1	0.24	<0.01	0.04	**8.65**	**0.24**	13	328
	08/24/99	<0.01	0.35	<0.05	0.09	<0.01	<0.01	0.22	<0.01	16	280
	08/17/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	<0.05	<0.01	11	300
	08/02/01	<0.0125	0.265	<0.05	0.472	<0.025	<0.01	<0.05	<0.025	13.1	312
	09/25/02	<0.0125	<0.100	<0.05	0.299	<0.005	<0.01	<0.05	<0.025	24	235
	09/17/03	---	---	<0.01	0.089	---	---	<0.05	<0.025	11.7	345
MW-4	05/17/95	<0.01	2.44	**0.2**	0.69	<0.01	<0.01	**12.33**	0.15	**934**	**2,211**
	09/25/02	<0.0125	<0.100	0.083	**1.03**	<0.005	<0.01	**12.6**	0.132	**820**	**1,944**
	09/17/03	---	---	**0.119**	0.781	---	---	**12.6**	0.113	**691**	**1,836**
MW-5	05/17/95	<0.01	**5.65**	**0.1**	**4.1**	<0.01	<0.01	**8.34**	**0.49**	**254**	937
	08/24/99	<0.01	<0.2	<0.05	**2.5**	<0.01	<0.01	**6.4**	**0.53**	**320**	**1,300**
	08/18/00	<0.01	<0.2	0.05	0.17	<0.01	<0.01	<0.05	**0.77**	240	**1,600**
	08/03/01	<0.0125	0.317	0.074	0.196	<0.025	<0.01	**16.8**	**1.11**	**250**	**2,200**
	09/26/02	<0.0125	<0.100	0.057	0.884	<0.005	<0.01	**7.30**	**0.554**	**260**	**1,330**
	09/18/03	---	---	0.082	0.85	---	---	**8.02**	**0.586**	215	**1,310**
MW-6	05/17/95	<0.01	**11.43**	**0.2**	**1.25**	<0.01	<0.01	**19.66**	**0.25**	181	**1,001**
	09/25/02	<0.0125	0.148	0.090	**1.55**	<0.005	<0.01	**7.13**	0.0752	**584**	**1,312**
MW-7	05/17/95	<0.01	**38.16**	**0.1**	0.45	**0.01**	**0.07**	**18.28**	**0.22**	113	713
	08/24/99	<0.01	<0.2	<0.05	0.87	<0.01	<0.01	0.06	<0.01	97	650
	08/17/00	<0.01	<0.2	<0.05	0.07	<0.01	<0.01	<0.05	<0.01	98	630
	08/02/01	<0.0125	0.259	<0.05	<0.1	<0.025	<0.01	<0.05	<0.025	94.5	646
	09/26/02	<0.0125	<0.100	<0.05	0.517	<0.005	<0.01	<0.05	<0.025	112	684
	09/17/03	---	---	<0.01	0.065	---	---	<0.05	<0.025	95.6	659
MW-8	05/17/95	<0.01	0.21	**0.2**	0.11	<0.01	<0.01	0.17	0.07	83	**1,366**
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	0.05	<0.01	25	350
	08/18/00	<0.01	<0.2	<0.05	0.19	<0.01	<0.01	<0.05	<0.01	9.4	290
	08/02/01	<0.0125	0.279	<0.05	0.153	<0.025	<0.01	<0.05	<0.025	21.5	400
	09/25/02	<0.0125	<0.100	<0.05	0.181	<0.005	<0.01	<0.05	<0.025	56	416
	09/17/03	---	---	<0.01	0.138	---	---	<0.05	<0.025	38.8	799
MW-9	05/17/95	<0.01	**26.58**	<0.1	0.3	<0.01	**0.06**	**12.08**	0.15	73	602
	04/24/96	<0.01	<0.2	---	---	---	<0.05	<0.03	<0.01	58	579
	08/15/97	<0.01	0.5	---	---	---	<0.05	0.91	<0.01	53	**1,600**
	07/22/98	<0.002	<0.01	---	---	---	<0.01	0.07	<0.01	53	580
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	<0.05	<0.01	52	580
	08/18/00	<0.01	<0.2	<0.05	0.14	<0.01	<0.01	<0.05	0.02	57	600
	08/02/01	<0.0125	0.745	<0.05	0.473	<0.025	<0.01	0.197	<0.025	52.9	616
	09/25/02	<0.0125	<0.100	<0.05	0.746	<0.005	<0.01	<0.05	0.040	84	615
	09/18/03	---	---	<0.01	0.135	---	---	<0.05	0.047	66.6	734

Table 4 (continued)
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Gas Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L) Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Ions (mg/L) Cl	TDS
MW-10	05/17/95	<0.01	4.79	<0.1	0.18	<0.01	<0.01	**3.05**	**0.41**	98	903
	04/24/96	0.01	<0.2	---	---	---	<0.01	0.26	**0.93**	72	909
	08/15/97	<0.01	<0.2	---	---	---	<0.01	0.61	**0.63**	120	**1,300**
	07/22/98	<0.002	<0.3	---	---	---	<0.002	**3.1**	**0.77**	67	820
	08/25/99	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	0.62	**0.69**	120	**1,200**
	08/18/00	<0.01	<0.2	<0.05	0.17	<0.01	<0.01	<0.05	**0.58**	100	**1,100**
	08/03/01	<0.0125	0.341	<0.05	0.507	<0.025	<0.01	0.492	**0.482**	106	**1,190**
	09/26/02	<0.0125	<0.100	<0.05	0.300	<0.005	<0.01	0.870	**0.455**	112	**1,140**
	09/18/03	---	---	<0.01	0.152	---	---	0.886	**0.422**	78.2	**1,076**
MW-10D	05/17/95	<0.01	3.99	<0.1	0.17	**0.01**	0.02	**2.88**	**0.25**	59	707
	04/24/96	<0.01	<0.2	---	---	---	<0.05	0.22	0.17	72	861
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.39	**0.2**	78	910
	07/22/98	<0.002	<0.3	---	---	---	<0.01	0.6	0.15	82	690
	08/25/99	<0.01	0.2	<0.05	0.08	<0.01	<0.01	0.51	**0.28**	110	**1,000**
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	0.57	**0.38**	87	950
	08/03/01	<0.0125	0.26	<0.05	0.527	<0.025	<0.01	**1.19**	**0.477**	92.8	**1,180**
	09/25/02	<0.0125	<0.100	<0.05	0.171	<0.005	<0.01	**1.05**	**0.374**	120	**1,127**
	09/18/03	---	---	0.073	0.067	---	---	0.561	**0.313**	93	**1,088**
MW-11	05/17/95	<0.01	2.14	<0.1	0.1	<0.01	0.05	**1.34**	0.15	49	890
	04/24/96	0.02	<0.2	---	---	---	<0.03	0.13	0.08	28	963
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.11	0.17	39	**1,200**
	07/22/98	<0.002	<0.3	---	---	---	<0.01	<0.05	0.09	31	**1,000**
	08/24/99	<0.01	<0.2	<0.05	0.08	<0.01	<0.01	<0.05	0.13	40	850
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	<0.05	0.16	44	830
	08/03/01	<0.0125	0.326	<0.05	0.514	<0.025	<0.01	<0.05	0.143	51.1	835
	09/26/02	<0.0125	<0.100	<0.05	0.227	<0.005	<0.01	<0.05	0.155	80	896
	09/17/03	---	---	<0.01	0.084	---	---	<0.05	0.142	73.1	844
MW-12	05/17/95	<0.01	**5.35**	<0.1	0.13	<0.01	0.03	**2.8**	0.07	225	**1,128**
	04/24/96	<0.01	<0.2	---	---	---	<0.05	<0.03	<0.01	91	736
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.48	0.05	**320**	**1,600**
	07/22/98	<0.002	<0.3	---	---	---	<0.01	0.4	0.05	210	**1,100**
	08/24/99	<0.01	<0.2	<0.05	0.12	**0.03**	0.04	0.29	0.07	190	**1,300**
	08/18/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	0.31	0.03	130	990
	08/02/01	<0.0125	0.196	<0.05	0.481	<0.025	<0.01	<0.05	<0.025	118	996
	09/26/02	<0.0125	<0.100	<0.05	0.247	<0.005	<0.01	<0.05	0.0381	**276**	**1,488**
	09/17/03	---	---	<0.01	0.062	---	---	<0.05	0.027	65.6	996
MW-13	05/17/95	**0.18**	**14.08**	<0.1	0.59	<0.01	<0.01	**7.02**	0.11	137	629
	04/24/96	<0.01	<0.2	---	---	---	<0.05	<0.03	<0.01	96	667
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.24	0.01	190	930
	07/22/98	<0.002	0.36	---	---	---	<0.01	0.34	0.01	97	800
	08/24/99	<0.01	<0.2	0.06	0.22	**0.04**	0.04	0.08	0.05	140	930
	08/18/00	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	<0.05	0.05	230	960
	08/03/01	<0.0125	0.302	<0.05	0.442	<0.025	<0.01	0.078	0.14	**339**	**1,410**
	09/26/02	<0.0125	<0.100	<0.05	0.284	<0.005	<0.01	0.081	0.157	96	**1,098**
	09/17/03	---	---	<0.01	0.126	---	---	0.159	0.170	**267**	**1,198**
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
--- Indicates sample was not analyzed for this constituent.

Table 5
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)	Total Iron (mg/L)	Manganese (mg/L)	Ferrous Iron - Fe^{-2} (mg/L)
MW-1	05/17/95	0.51	<0.3	**1,039**	**30.76**	**0.56**	---
	08/25/99	1.90	**120**	**660**	<0.05	**0.22**	---
	02/22/00	3.37	**130**	570	---	---	---
	08/17/00	0.35	**150**	590	<0.05	<0.01	---
	02/07/01	0.24	**96**	400	---	---	---
	08/02/01	2.04	2.5	268	<0.05	0.194	---
	03/11/02	2.65	<1.00	234	---	---	---
	09/25/02	0.57	0.15	293	<0.05	0.164	0.05
	03/10/03	1.70	0.10	394	0.068	0.199	0.10
	09/17/03	0.62	1.01	210	0.099	**0.242**	0.14
MW-2	05/17/95	1.60	0.81	62	0.34	**0.41**	---
	08/24/99	5.90	2.6	18	0.73	0.03	---
	02/22/00	4.47	2.8	17	---	---	---
	08/17/00	1.06	0.53	17	<0.05	<0.01	---
	02/07/01	3.36	1.8	19	---	---	---
	08/02/01	4.37	2.1	15	<0.05	<0.025	---
	03/11/02	4.53	1.75	29.9	---	---	---
	09/25/02	3.75	1.19	49.2	0.09	<0.025	0.35
	03/10/03	4.17	0.40	54.4	<0.05	<0.025	0.03
	09/17/03	3.76	2.00	32.8	<0.05	<0.025	0.08
MW-3	05/17/95	4.88	3.71	126	**8.65**	**0.24**	---
	02/09/99	8.5	5.2	59	---	<0.01	---
	08/24/99	7.61	3.7	35	0.22	<0.01	---
	02/22/00	8.08	4.0	33	---	---	---
	08/17/00	7.48	1.9	44	<0.05	<0.01	---
	02/07/01	6.78	2.8	44	---	---	---
	08/02/01	8.79	3.1	44	<0.05	<0.025	---
	03/11/02	8.64	3.21	63.2	---	---	---
	09/25/02	7.97	2.85	58.5	<0.05	<0.025	0.18
	03/10/03	6.40	1.10	51.3	0.096	<0.025	0.00
	09/17/03	7.50	2.41	25.7	<0.05	<0.025	0.12
MW-4	05/17/95	NS	<0.15	78	**12.33**	0.15	---
	03/12/02	2.09	<1.00	17.6	---	---	---
	09/25/02	1.56	3.94	21.9	**12.6**	0.13	**1.56**
	03/11/03	1.87	0.60	49.2	**14.9**	0.125	**6.28**
	09/17/03	1.16	3.23	10.8	**12.6**	0.113	**5.92**
MW-5	05/17/95	NS	<0.15	67	**8.34**	**0.49**	---
	08/25/99	0.00	<1.0	84	**6.4**	**0.53**	---
	02/23/00	0.34	< 1.0	64	---	---	---
	08/18/00	0.10	<0.1	390	<0.05	**0.77**	---
	02/08/01	0.02	<1.0	370	---	---	---
	08/03/01	2.61	<1.0	**805**	**16.8**	**1.11**	---
	03/12/02	2.61	<1.0	358	---	---	---
	09/26/02	0.18	<1.0	155	**7.30**	**0.55**	**9.86**
	03/11/03	1.56	0.50	261	**9.02**	0.639	**3.20**
	09/18/03	0.87	0.49	101	**8.02**	**0.59**	**4.50**
WQCC Standards		---	10.0	600	1.0	0.2	1.0

NA indicates not analyzed for this constituent.

New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.

Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (Continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)	Total Iron (mg/L)	Manganese (mg/L)	Ferrous Iron - Fe^{-2} (mg/L)
MW-6	05/17/95	NS	<0.15	72	**19.66**	**0.25**	---
	09/25/02	1.93	0.96	8.16	**7.13**	0.08	**9.56**
	03/11/03	1.52	0.40	50.1	**8.59**	0.09	**3.18**
MW-7	05/17/95	6.50	2.8	161	18.28	0.22	---
	08/24/99	6.70	5.5	120	0.06	<0.01	---
	02/22/00	7.39	6.0	96	---	---	---
	08/17/00	6.98	3.0	98	<0.05	<0.05	---
	02/07/01	9.82	5.2	94	---	---	---
	08/02/01	7.64	5.2	90	<0.05	<0.05	---
	03/11/02	7.92	5.33	108	---	---	---
	09/26/02	2.60	5.23	41.6	<0.05	<0.05	0.10
	03/11/03	4.94	1.30	<2.50	0.096	<0.025	0.12
	09/17/03	6.93	4.04	46.6	<0.05	<0.025	0.30
MW-8	05/17/95	1.60	**33.4**	**602**	0.17	0.07	---
	08/24/99	4.88	3.2	31	0.05	<0.01	---
	02/22/00	3.48	3.4	22	---	---	---
	08/18/00	5.13	13	16	<0.05	<0.01	---
	02/07/01	2.67	1.9	22	---	---	---
	08/02/01	4.70	2.3	27	<0.05	<0.05	---
	03/11/02	3.11	5.36	49.9	---	---	---
	09/25/02	5.31	4.54	49.3	<0.05	<0.05	0.14
	03/10/03	4.33	0.50	77.1	<0.05	<0.025	0.01
	09/17/03	3.24	5.60	102	<0.05	<0.025	0.00
MW-9	05/17/95	1.85	4.70	126	12.08	0.15	---
	11/14/95	2.82	---	---	---	---	---
	01/17/96	5.3	---	---	---	---	---
	04/24/96	2.0	0.2	60	<0.03	<0.01	---
	01/22/97	14.6	3.4	71	---	---	---
	08/15/97	3.8	3.4	82	0.91	<0.01	---
	01/22/98	5.2	4.1	160	---	---	---
	07/20/98	2.38	5.4	72	0.07	<0.01	---
	02/09/99	3.1	5.4	78	---	---	---
	08/24/99	3.16	4.5	76	<0.05	<0.01	---
	02/22/00	0.28	4.5	75	---	---	---
	08/18/00	0.60	1.3	81	<0.05	0	---
	02/07/01	0.48	2.5	77	---	---	---
	08/02/01	1.61	2.3	75	0.197	<0.025	---
	03/11/02	2.58	2.05	91.1	---	---	---
	09/25/02	2.54	1.69	31.9	<0.05	0.040	0.11
	03/10/03	1.79	0.10	99.2	<0.05	0.031	0.02
	09/18/03	1.89	0.42	57	<0.05	0.047	0.05
WQCC Standards		---	10.0	600	1.0	0.2	1.0

--- indicates not analyzed for this constituent.
New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (Continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)	Total Iron (mg/L)	Manganese (mg/L)	Ferrous Iron - Fe^{-2} (mg/L)
MW-10	05/17/95	1.05	1.03	184	**3.05**	**0.41**	---
	11/14/95	1.98	<0.01	174	---	---	---
	01/17/96	5.0	<0.5	40	---	---	---
	04/24/96	1.6	<0.1	16	0.26	**0.93**	---
	01/22/97	8.75	<0.1	25	---	---	---
	08/15/97	2.9	< 1.0	210	0.61	**0.63**	---
	01/22/98	4.5	0.22	52	---	---	---
	07/22/98	1.13	3.50	40	**3.1**	**0.8**	---
	02/09/99	1.6	< 1.0	68	---	---	---
	08/25/99	0.00	<1.0	200	0.62	**0.69**	---
	02/23/00	0.47	< 1.0	180	---	---	---
	08/18/00	NA	<0.1	200	<0.05	**1**	---
	02/08/01	0.00	<1.0	220	---	---	---
	08/03/01	2.34	<1.0	206	0.492	**0.482**	---
	03/12/02	2.38	<1.0	195	---	---	---
	09/26/02	0.10	0.91	133	0.87	**0.46**	0.90
	03/10/03	4.11	0.10	199	0.286	**0.477**	0.41
	09/18/03	1.60	<0.1	64.8	0.886	**0.422**	0.92
MW-10D	05/17/95	0.45	0.63	232	**2.88**	**0.25**	---
	11/14/95	2.41	---	---	---	---	---
	01/17/96	5.0	---	---	---	---	---
	04/24/96	1.8	<0.1	21	0.22	0.17	---
	01/22/97	5.5	<0.1	210	---	---	---
	08/15/97	1.8	< 1.0	180	0.39	**0.20**	---
	01/22/98	5.7	1.30	230	---	---	---
	07/22/98	1.49	4.0	140	0.60	0.15	---
	02/09/99	1.9	< 1.0	200	---	---	---
	08/25/99	1.54	2.4	220	0.51	**0.28**	---
	02/23/00	3.03	2.7	220	---	---	---
	08/18/00	0.50	<0.1	250	0.57	**0.38**	---
	02/07/01	0.06	<1.0	260	---	---	---
	08/03/01	1.88	<1.0	300	**1.19**	**0.48**	---
	03/12/02	2.46	<1.0	283	---	---	---
	09/25/02	0.36	0.64	253	**1.05**	**0.37**	**1.05**
	03/10/03	1.51	0.10	265	0.915	**0.361**	---
	09/18/03	1.15	0.38	117	0.561	**0.313**	---
MW-11	05/17/95	1.05	**28.6**	190	**1.34**	**0.15**	---
	11/14/95	2.30	1.56	184	---	---	---
	01/17/96	2.8	**43.3**	150	---	---	---
	04/24/96	2.0	1.9	124	0.13	0.08	---
	01/22/97	7.0	**24**	170	---	---	---
	08/15/97	1.8	**40**	160	0.11	0.17	---
	01/22/98	4.3	**58**	150	---	---	---
	07/22/98	1.06	**19**	200	<0.05	0.09	---
WQCC Standards		---	10.0	600	1.0	0.2	1.0

--- indicates not analyzed for this constituent.

New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.

Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (Continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)	Total Iron (mg/L)	Manganese (mg/L)	Ferrous Iron - Fe^{-2} (mg/L)
MW-11	02/09/99	1.4	**12**	150	---	---	---
	08/24/99	0.09	8.0	120	<0.05	0.13	---
	02/23/00	0.58	7.0	120	---	---	---
	08/18/00	0.00	3.1	120	<0.05	0.16	---
	02/07/01	0.07	4.0	100	---	---	---
	08/03/01	2.46	4.1	96	<0.05	0.143	---
	03/12/02	2.43	3.69	104	---	---	---
	09/26/02	0.30	3.33	47.9	<0.05	0.155	0.10
	03/10/03	3.82	0.10	104	<0.05	0.151	0.01
	09/17/03	0.63	2.53	49.9	<0.05	0.142	0.04
MW-12	05/17/95	0.97	1.01	206	**2.80**	**0.07**	---
	11/14/95	3.15	---	---	---	---	---
	01/17/96	1.7	---	---	---	---	---
	04/24/96	1.8	<0.1	53	<0.03	<0.01	---
	01/22/97	11.8	<0.1	150	---	---	---
	08/15/97	1.9	< 1.0	210	0.48	0.05	---
	01/22/98	4.2	0.41	150	---	---	---
	07/22/98	2.52	0.71	130	0.40	0.05	---
	02/09/99	3.7	3.80	98	---	---	---
	08/24/99	0.14	<1.0	200	0.29	0.07	---
	02/22/00	0.81	3.10	73	---	---	---
	08/18/00	0.26	<0.1	120	0.31	0.03	---
	02/07/01	0.22	1.6	120	---	---	---
	08/02/01	2.23	2.2	116	<0.05	<0.025	---
	03/12/02	2.98	4.39	211	---	---	---
	09/26/02	0.72	3.14	107	<0.05	0.038	0.07
	03/10/03	3.00	0.20	165	<0.05	0.031	0.14
	09/17/03	2.27	3.37	92.5	<0.05	0.027	0.01
MW-13	05/17/95	1.51	5.00	99	**7.02**	**0.11**	---
	11/14/95	5.00	0.02	44	---	---	---
	01/17/96	2.0	6.54	42	---	---	---
	04/24/96	2.6	0.2	46	<0.03	<0.01	---
	01/22/97	9.5	5.4	65	---	---	---
	08/15/97	5.1	4.5	78	0.24	0.01	---
	01/22/98	7.4	7.3	88	---	---	---
	07/20/98	3.62	**12**	74	0.34	0.01	---
	02/09/99	2.7	**16**	79	---	---	---
	08/24/99	0.30	**16**	83	0.08	0.05	---
	02/23/00	0.59	9.1	86	---	---	---
	08/18/00	0.31	3.2	100	<0.05	0.05	---
	02/07/01	0.17	4.3	100	---	---	---
	08/03/01	2.63	1.3	126	0.08	0.140	---
	03/12/02	2.49	2.61	146	---	---	---
	09/26/02	0.40	3.09	171	0.08	0.157	0.18
	03/10/03	3.38	0.50	188	0.115	0.154	0.32
	09/17/03	0.98	2.01	67.2	0.159	0.170	**1.12**
WQCC Standards		---	10.0	600	1.0	0.2	1.0

--- indicates not analyzed for this constituent.

New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.

Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 6

LNAPL Recovery Volumes

Linam Ranch Plant

Date	LNAPL Thickness (feet)		LNAPL Recovered (gallons)		Cumulative Product LNAPL (gallons)
	MW-4	MW-6	MW-4	MW-6	
04/22/98	0.43	0.05	0.09	0.04	0.13
05/06/98	0.44	0.03	0.08	0.03	0.24
06/23/98	0.47	0.07	0.35	0.00	0.60
07/20/98	0.36	0.08	0.38	0.00	0.98
08/07/98	0.16	0.12	0.35	0.00	1.33
09/17/98	0.09	0.19	0.35	0.01	1.68
10/28/98	0.05	0.00	0.36	0.01	2.05
11/17/98	0.04	0.02	0.14	0.01	2.19
12/15/98	0.06	<0.01	0.35	0.01	2.55
01/18/99	0.11	0.01	0.37	0.00	2.92
02/09/99	0.13	<0.01	0.38	0.00	3.30
03/24/99	0.53	0.07	0.40	0.41	4.11
04/21/99	0.72	0.01	0.94	0.00	5.05
05/13/99	1.00	0.03	0.45	0.00	5.50
06/14/99	1.32	0.01	0.47	0.00	5.96
08/04/99	1.10	<0.01	0.46	0.00	6.42
08/20/99	1.11	<0.01	0.45	0.00	6.87
08/25/99	0.88	<0.01	0.42	0.00	7.29
09/14/99	0.70	0.00	0.43	0.00	7.72
10/26/99	0.45	<0.01	0.42	0.00	8.14
11/22/99	0.37	<0.01	0.42	0.00	8.56
12/22/99	0.23	0.01	0.42	0.00	8.98
01/26/00	0.12	<0.01	0.40	0.25	9.63
02/22/00	0.03	<0.01	0.18	0.20	10.01
04/04/00	<0.01	0.00	0.13	0.00	10.14
04/24/00	0.05	0.16	0.02	0.00	10.16
06/15/00	0.03	0.48	0.13	0.71	11.00
07/12/00	<0.01	<0.01	0.03	0.04	11.07
08/18/00	<0.01	<0.01	0.002	0.002	11.08
10/02/00	<0.01	0.70	0.00	0.84	11.92
12/14/00	<0.01	0.08	0.00	0.22	12.14
01/23/01	0.01	0.71	0.10	0.56	12.80
02/06/01	0.01	0.11	0.04	0.18	13.02
03/21/01	0.01	0.35	0.00	0.39	13.41
05/16/01	0.00	0.02	0.07	0.12	13.61
06/19/01	0.01	0.01	0.01	0.05	13.66
07/20/01	0.00	0.02	0.03	0.08	13.78
08/02/01	0.01	0.01	0.00	0.05	13.83

Table 6
LNAPL Recovery Volumes
Linam Ranch Plant

Date	LNAPL Thickness (feet)		LNAPL Recovered (gallons)		Cumulative Product LNAPL (gallons)
	MW-4	MW-6	MW-4	MW-6	
09/11/01	0.01	0.11	0.02	0.14	14.00
10/09/01	0.01	0.04	0.02	0.15	14.16
11/08/01	<0.01	0.09	0.00	0.11	14.28
12/10/01	0.01	0.01	0.04	0.09	14.41
01/14/02	0.10	0.01	0.02	0.30	14.73
02/17/02	<0.01	<0.01	0.04	0.08	14.85
03/11/02	<0.01	0.01	0.00	0.04	14.89
04/09/02	<0.01	0.04	0.05	0.18	15.13
05/14/02	0.01	0.01	0.13	0.09	15.34
06/18/02	<0.01	0.02	0.12	0.12	15.59
07/11/02	<0.01	0.01	0.10	0.06	15.75
08/14/02	0.01	0.01	0.11	0.30	16.15
09/25/02	<0.01	0.05	0.11	0.18	16.45
10/24/02	0.01	0.01	0.12	0.02	16.58
11/22/02	<0.01	<0.01	0.03	0.02	16.62
12/17/02	<0.01	<0.01	0.06	0.10	16.78
01/14/03	<0.01	0.01	0.08	0.15	17.01
02/19/03	<0.01	0.10	0.06	0.21	17.28
03/08/03	<0.01	<0.01	0.00	0.10	17.38
04/23/03	0.00	0.16	0.04	0.16	17.58
05/29/03	0.00	0.24	0.00	0.13	17.71
06/23/03	0.00	0.27	0.01	0.19	17.91
07/30/03	0.01	0.45	0.06	0.26	18.23
08/20/03	0.00	0.40	0.00	0.26	18.49
09/17/03	0.00	0.48	0.00	0.35	18.84
10/28/03	0.00	0.65	0.00	0.34	19.18
10/30/03	0.00	0.61	0.00	0.04	19.22
11/21/03	0.00	0.52	0.00	0.16	19.39
12/08/04	0.00	0.37	0.00	0.00	19.39
12/30/03	0.00	0.37	0.02	0.17	19.58
Total Volume of LNAPL Recovered Since 04/22/98:					**19.58**
					2.80

LNAPL recovery methods used:
MW-4: Hydrophobic (oil adsorbent) sock.
MW-6: Passive bailer (hydrophobic sock replaced with bailer on 05-29-03).

APPENDIX A

Laboratory Analytical Reports and Chain-of-Custody Documentation

APPENDIX A

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, TX 79708

Report Date: March 28, 2003

Work Order: 3031309

Cost Center #: V-102
Project Location: Linam Ranch Plant
Project Name: Duke energy Field Services
Project Number: Linam Ranch Plant

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
2258	MW-3	Water	2003-03-10	09:20	2003-03-13
2259	MW-1	Water	2003-03-10	10:20	2003-03-13
2260	MW-2	Water	2003-03-10	11:00	2003-03-13
2261	MW-9	WaterWater	2003-03-10	13:00	2003-03-13
2262	MW-8	Water	2003-03-10	14:00	2003-03-13
2263	MW-12	Water	2003-03-10	14:50	2003-03-13
2264	MW-13	Water	2003-03-10	15:30	2003-03-13
2265	MW-11	Water	2003-03-10	16:00	2003-03-13
2266	MW-10	Water	2003-03-10	16:45	2003-03-13
2267	MW-10d	Water	2003-03-10	17:26	2003-03-13
2268	MW-5	WaterWater	2003-03-11	11:00	2003-03-13
2269	MW-4	Water	2003-03-11	11:45	2003-03-13
2270	MW-6	Water	2003-03-11	12:20	2003-03-13
2271	MW-7	Water	2003-03-11	13:30	2003-03-13
2272	Rinsate	Water	2003-03-10	00:00	2003-03-13
2273	Duplicate	Water	2003-03-10	00:00	2003-03-13
2274	Trip Blank	Water	2003-03-10	00:00	2003-03-13

Comment(s)
Sample 2270: BTEX sample received at pH >2.

	BTEX			
Sample - Field Code	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (isomers) (mg/L)
2258 - MW-3	<0.00100	<0.00100	<0.00100	<0.00100
2259 - MW-1	<0.00100	<0.00100	<0.00100	<0.00100
2260 - MW-2	<0.00100	<0.00100	<0.00100	<0.00100
2261 - MW-9	0.0768	<0.00100	<0.00100	0.00250
2262 - MW-8	<0.00100	<0.00100	<0.00100	<0.00100
2263 - MW-12	<0.00100	<0.00100	<0.00100	<0.00100
2264 - MW-13	<0.00100	<0.00100	<0.00100	<0.00100
2265 - MW-11	<0.00100	<0.00100	<0.00100	<0.00100
2266 - MW-10	4.21	<0.100	0.303	<0.100
2267 - MW-10d	<0.00500	<0.00500	<0.00500	<0.00500
2268 - MW-5	0.0786	<0.0500	0.0719	<0.0500
2269 - MW-4	16.9	<0.100	0.520	0.151
2270 - MW-6	1.55	<0.100	0.148	<0.100
2271 - MW-7	<0.00500	<0.00500	<0.00500	<0.00500

continued ...

... continued

Sample - Field Code	BTEX Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (isomers) (mg/L)
2272 - Rinsate	<0.00100	<0.00100	<0.00100	<0.00100
2273 - Duplicate	4.12	<0.100	0.518	0.200
2274 - Trip Blank	<0.00100	<0.00100	<0.00100	<0.00100

Sample: 2258 - MW-3

Param	Flag	Result	Units	RL
Total Iron		0.0956	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Sulfate		51.3	mg/L	0.500

Sample: 2259 - MW-1

Param	Flag	Result	Units	RL
Total Iron		0.0675	mg/L	0.0500
Total Manganese		0.199	mg/L	0.0250
Sulfate		394	mg/L	0.500

Sample: 2260 - MW-2

Param	Flag	Result	Units	RL
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Sulfate		54.4	mg/L	0.500

Sample: 2261 - MW-9

Param	Flag	Result	Units	RL
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		0.0310	mg/L	0.0250
Sulfate		99.2	mg/L	0.500

Sample: 2262 - MW-8

Param	Flag	Result	Units	RL
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Sulfate		77.1	mg/L	0.500

Sample: 2263 - MW-12

Param	Flag	Result	Units	RL
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		0.0310	mg/L	0.0250
Sulfate		165	mg/L	0.500

Sample: 2264 - MW-13

Param	Flag	Result	Units	RL
Total Iron		0.115	mg/L	0.0500
Total Manganese		0.154	mg/L	0.0250
Sulfate		188	mg/L	0.500

Sample: 2265 - MW-11

Param	Flag	Result	Units	RL
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		0.151	mg/L	0.0250
Sulfate		104	mg/L	0.500

Sample: 2266 - MW-10

Param	Flag	Result	Units	RL
Total Iron		0.286	mg/L	0.0500
Total Manganese		0.477	mg/L	0.0250
Sulfate		199	mg/L	0.500

Sample: 2267 - MW-10d

Param	Flag	Result	Units	RL
Total Iron		0.915	mg/L	0.0500
Total Manganese		0.361	mg/L	0.0250
Sulfate		265	mg/L	0.500

Sample: 2268 - MW-5

Param	Flag	Result	Units	RL
Total Iron		9.02	mg/L	0.0500
Total Manganese		0.639	mg/L	0.0250
Sulfate		261	mg/L	0.500

Sample: 2269 - MW-4

Param	Flag	Result	Units	RL
Total Iron		14.9	mg/L	0.0500
Total Manganese		0.125	mg/L	0.0250
Sulfate		49.2	mg/L	0.500

Sample: 2270 - MW-6

Param	Flag	Result	Units	RL
Total Iron		8.59	mg/L	0.0500
Total Manganese		0.0930	mg/L	0.0250
Sulfate		50.1	mg/L	0.500

Sample: 2271 - MW-7

Param	Flag	Result	Units	RL
Total Iron		0.0955	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Sulfate		<2.50	mg/L	0.500

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, TX 79708

Report Date: March 28, 2003

Work Order: 3031309

Cost Center #: V-102
Project Location: Linam Ranch Plant
Project Name: Duke energy Field Services
Project Number: Linam Ranch Plant

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
2258	MW-3	Water	2003-03-10	09:20	2003-03-13
2259	MW-1	Water	2003-03-10	10:20	2003-03-13
2260	MW-2	Water	2003-03-10	11:00	2003-03-13
2261	MW-9	WaterWater	2003-03-10	13:00	2003-03-13
2262	MW-8	Water	2003-03-10	14:00	2003-03-13
2263	MW-12	Water	2003-03-10	14:50	2003-03-13
2264	MW-13	Water	2003-03-10	15:30	2003-03-13
2265	MW-11	Water	2003-03-10	16:00	2003-03-13
2266	MW-10	Water	2003-03-10	16:45	2003-03-13
2267	MW-10d	Water	2003-03-10	17:26	2003-03-13
2268	MW-5	WaterWater	2003-03-11	11:00	2003-03-13
2269	MW-4	Water	2003-03-11	11:45	2003-03-13
2270	MW-6	Water	2003-03-11	12:20	2003-03-13
2271	MW-7	Water	2003-03-11	13:30	2003-03-13
2272	Rinsate	Water	2003-03-10	00:00	2003-03-13
2273	Duplicate	Water	2003-03-10	00:00	2003-03-13
2274	Trip Blank	Water	2003-03-10	00:00	2003-03-13

Comment(s)
Sample 2270: BTEX sample received at pH >2.

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.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 2258 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0986	mg/L	1	0.100	99	61 - 127
4-Bromofluorobenzene (4-BFB)		0.087	mg/L	1	0.100	87	72.6 - 130

Sample: 2258 - MW-3

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2258 - MW-3

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 2258 - MW-3

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		51.3	mg/L	5	0.500

Sample: 2259 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0995	mg/L	1	0.100	100	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0873	mg/L	1	0.100	87	72.6 - 130

Sample: 2259 - MW-1

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2259 - MW-1

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.199	mg/L	1	0.0250

Sample: 2259 - MW-1

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	490	Date Analyzed:	2003-03-21	Analyzed By:	JSW
Prep Batch:	451	Date Prepared:	2003-03-20	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		394	mg/L	50	0.500

Sample: 2260 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.1	mg/L	1	0.100	100	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0875	mg/L	1	0.100	88	72.6 - 130

Sample: 2260 - MW-2

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2260 - MW-2

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 2260 - MW-2

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		54.4	mg/L	5	0.500

Sample: 2261 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		0.0768	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		0.00250	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.1	mg/L	1	0.100	100	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0895	mg/L	1	0.100	90	72.6 - 130

Sample: 2261 - MW-9

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2261 - MW-9

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.0310	mg/L	1	0.0250

Sample: 2261 - MW-9

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		99.2	mg/L	5	0.500

Sample: 2262 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0978	mg/L	1	0.100	98	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0857	mg/L	1	0.100	86	72.6 - 130

Sample: 2262 - MW-8

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2262 - MW-8

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 2262 - MW-8

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		77.1	mg/L	5	0.500

Sample: 2263 - MW-12

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0995	mg/L	1	0.100	100	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0858	mg/L	1	0.100	86	72.6 - 130

Sample: 2263 - MW-12

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2263 - MW-12

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.0310	mg/L	1	0.0250

Sample: 2263 - MW-12

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		165	mg/L	5	0.500

Sample: 2264 - MW-13

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.102	mg/L	1	0.100	102	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0912	mg/L	1	0.100	91	72.6 - 130

Sample: 2264 - MW-13

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2264 - MW-13

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.154	mg/L	1	0.0250

Sample: 2264 - MW-13

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		188	mg/L	10	0.500

Sample: 2265 - MW-11

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0964	mg/L	1	0.100	96	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0853	mg/L	1	0.100	85	72.6 - 130

Sample: 2265 - MW-11

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2265 - MW-11

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.151	mg/L	1	0.0250

Sample: 2265 - MW-11

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		104	mg/L	5	0.500

Sample: 2266 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		4.21	mg/L	100	0.00100
Toluene		<0.100	mg/L	100	0.00100
Ethylbenzene		0.303	mg/L	100	0.00100
Xylene (isomers)		<0.100	mg/L	100	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		9.65	mg/L	100	0.100	96	61 - 127
4-Bromofluorobenzene (4-BFB)		8.23	mg/L	100	0.100	82	72.6 - 130

Sample: 2266 - MW-10

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2266 - MW-10

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.477	mg/L	1	0.0250

Sample: 2266 - MW-10

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		199	mg/L	10	0.500

Sample: 2267 - MW-10d

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.46	mg/L	5	0.100	92	61 - 127
4-Bromofluorobenzene (4-BFB)		0.398	mg/L	5	0.100	80	72.6 - 130

Sample: 2267 - MW-10d

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2267 - MW-10d

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.361	mg/L	1	0.0250

Sample: 2267 - MW-10d

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	360	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	321	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		265	mg/L	10	0.500

Sample: 2268 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	359	Date Analyzed:	2003-03-13	Analyzed By:	CG
Prep Batch:	320	Date Prepared:	2003-03-13	Prepared By:	CG

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		0.0786	mg/L	50	0.00100
Toluene		<0.0500	mg/L	50	0.00100
Ethylbenzene		0.0719	mg/L	50	0.00100
Xylene (isomers)		<0.0500	mg/L	50	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		4.63	mg/L	50	0.100	92	61 - 127
4-Bromofluorobenzene (4-BFB)		4.08	mg/L	50	0.100	82	72.6 - 130

Sample: 2268 - MW-5

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2268 - MW-5

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.639	mg/L	1	0.0250

Sample: 2268 - MW-5

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	363	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	323	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		261	mg/L	10	0.500

Sample: 2269 - MW-4

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	352	Date Analyzed:	2003-03-13	Analyzed By:	DK
Prep Batch:	314	Date Prepared:	2003-03-13	Prepared By:	DK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		16.9	mg/L	100	0.00100
Toluene		<0.100	mg/L	100	0.00100
Ethylbenzene		0.520	mg/L	100	0.00100
Xylene (isomers)		0.151	mg/L	100	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		9.25	mg/L	100	0.100	92	78.7 - 110
4-Bromofluorobenzene (4-BFB)		9.24	mg/L	100	0.100	92	77.8 - 110

Sample: 2269 - MW-4

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2269 - MW-4

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.125	mg/L	1	0.0250

Sample: 2269 - MW-4

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	363	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	323	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		49.2	mg/L	50	0.500

Sample: 2270 - MW-6

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	352	Date Analyzed:	2003-03-13	Analyzed By:	DK
Prep Batch:	314	Date Prepared:	2003-03-13	Prepared By:	DK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		1.55	mg/L	100	0.00100
Toluene		<0.100	mg/L	100	0.00100
Ethylbenzene		0.148	mg/L	100	0.00100
Xylene (isomers)		<0.100	mg/L	100	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		9.62	mg/L	100	0.100	96	78.7 - 110
4-Bromofluorobenzene (4-BFB)		9.59	mg/L	100	0.100	96	77.8 - 110

Sample: 2270 - MW-6

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Parameter	Flag	Result	Units	MDL
Sulfate		<0.171	mg/L	0.1709

Method Blank (1) QC Batch: 520

Parameter	Flag	Result	Units	MDL
Total Iron		<0.00220	mg/L	0.0022

Method Blank (1) QC Batch: 520

Parameter	Flag	Result	Units	MDL
Total Manganese		<0.000275	mg/L	0.000275

Laboratory Control Spike (LCS-1) QC Batch: 352

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0938	0.0911	mg/L	1	0.100	<0.000410	94	1	80.5 - 113	5
Toluene	0.0937	0.0922	mg/L	1	0.100	<0.000760	94	1	81.2 - 112	5
Ethylbenzene	0.0925	0.0928	mg/L	1	0.100	<0.00120	92	0	82.2 - 112	6
Xylene (isomers)	0.281	0.282	mg/L	1	0.300	<0.00183	94	0	80.6 - 112	6

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0921	0.0936	mg/L	1	0.100	92	94	78.7 - 110
4-Bromofluorobenzene (4-BFB)	0.0929	0.0937	mg/L	1	0.100	93	94	77.8 - 110

Laboratory Control Spike (LCS-1) QC Batch: 359

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0949	0.0945	mg/L	1	0.100	<0.000350	95	0	77.7 - 115	5
Toluene	0.0943	0.0948	mg/L	1	0.100	<0.000550	94	0	76.5 - 114	4
Ethylbenzene	0.0935	0.0942	mg/L	1	0.100	<0.000690	94	0	78.7 - 112	6
Xylene (isomers)	0.279	0.282	mg/L	1	0.300	<0.00183	93	0	66.3 - 123	29

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0990	0.0999	mg/L	1	0.100	99	100	61 - 127
4-Bromofluorobenzene (4-BFB)	0.0980	0.0990	mg/L	1	0.100	98	99	72.6 - 130

Laboratory Control Spike (LCS-1) QC Batch: 490

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	12.6	12.7	mg/L	1	12.5	<0.171	101	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 520

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Iron	0.492	0.551	mg/L	1	0.500	<0.00220	98	6	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 520

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Manganese	0.238	0.239	mg/L	1	0.250	<0.000275	95	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 360

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	390	386	mg/L	10	12.5	265	100	0	69.9 - 114	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 363

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	656	661	mg/L	50	12.5	49.2	97	0	69.9 - 114	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 490

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Sulfate	74200	73900	mg/L	5000	12.5	12300	99	0	69.9 - 114	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-2) QC Batch: 520

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Iron	9.56	9.54	mg/L	1	0.500	9.02	108	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-2) QC Batch: 520

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Manganese	0.901	0.898	mg/L	1	0.250	0.639	105	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Standard (CCV-1) QC Batch: 352

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0938	94	85 - 115	2003-03-13
Benzene		mg/L	0.100	0.0938	94	85 - 115	2003-03-13
Toluene		mg/L	0.100	0.0957	96	85 - 115	2003-03-13
Toluene		mg/L	0.100	0.0957	96	85 - 115	2003-03-13
Ethylbenzene		mg/L	0.100	0.0952	95	85 - 115	2003-03-13
Ethylbenzene		mg/L	0.100	0.0952	95	85 - 115	2003-03-13
Xylene (isomers)		mg/L	0.300	0.289	96	85 - 115	2003-03-13
Xylene (isomers)		mg/L	0.300	0.289	96	85 - 115	2003-03-13

Standard (CCV-2) QC Batch: 352

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0928	93	85 - 115	2003-03-13
Benzene		mg/L	0.100	0.0928	93	85 - 115	2003-03-13
Toluene		mg/L	0.100	0.0937	94	85 - 115	2003-03-13
Toluene		mg/L	0.100	0.0937	94	85 - 115	2003-03-13
Ethylbenzene		mg/L	0.100	0.0941	94	85 - 115	2003-03-13
Ethylbenzene		mg/L	0.100	0.0941	94	85 - 115	2003-03-13
Xylene (isomers)		mg/L	0.300	0.285	95	85 - 115	2003-03-13
Xylene (isomers)		mg/L	0.300	0.285	95	85 - 115	2003-03-13

Standard (ICV-1) QC Batch: 359

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0939	94	85 - 115	2003-03-13
Toluene		mg/L	0.100	0.0941	94	85 - 115	2003-03-13
Ethylbenzene		mg/L	0.100	0.0936	94	85 - 115	2003-03-13
Xylene (isomers)		mg/L	0.300	0.280	93	85 - 115	2003-03-13

Standard (CCV-1) QC Batch: 359

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0920	92	85 - 115	2003-03-13
Toluene		mg/L	0.100	0.0928	93	85 - 115	2003-03-13
Ethylbenzene		mg/L	0.100	0.0925	92	85 - 115	2003-03-13
Xylene (isomers)		mg/L	0.300	0.276	92	85 - 115	2003-03-13

Standard (CCV-2) QC Batch: 359

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0932	93	85 - 115	2003-03-13
Toluene		mg/L	0.100	0.0924	92	85 - 115	2003-03-13
Ethylbenzene		mg/L	0.100	0.0911	91	85 - 115	2003-03-13
Xylene (isomers)		mg/L	0.300	0.271	90	85 - 115	2003-03-13

Standard (ICV-1) QC Batch: 360

Sample: 2270 - MW-6

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.0930	mg/L	1	0.0250

Sample: 2270 - MW-6

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	363	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	323	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		50.1	mg/L	50	0.500

Sample: 2271 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	352	Date Analyzed:	2003-03-13	Analyzed By:	DK
Prep Batch:	314	Date Prepared:	2003-03-13	Prepared By:	DK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.472	mg/L	5	0.100	94	78.7 - 110
4-Bromofluorobenzene (4-BFB)		0.471	mg/L	5	0.100	94	77.8 - 110

Sample: 2271 - MW-7

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	Units	Dilution
Total Iron		mg/L	1

Sample: 2271 - MW-7

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	520	Date Analyzed:	2003-03-24	Analyzed By:	RR
Prep Batch:	315	Date Prepared:	2003-03-14	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 2271 - MW-7

Analysis:	SO4 (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	363	Date Analyzed:	2003-03-17	Analyzed By:	JSW
Prep Batch:	323	Date Prepared:	2003-03-15	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Sulfate		<2.50	mg/L	5	0.500

Sample: 2272 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	352	Date Analyzed:	2003-03-13	Analyzed By:	DK
Prep Batch:	314	Date Prepared:	2003-03-13	Prepared By:	DK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.099	mg/L	1	0.100	99	78.7 - 110
4-Bromofluorobenzene (4-BFB)		0.098	mg/L	1	0.100	98	77.8 - 110

Sample: 2273 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	352	Date Analyzed:	2003-03-13	Analyzed By:	DK
Prep Batch:	314	Date Prepared:	2003-03-13	Prepared By:	DK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		4.12	mg/L	100	0.00100
Toluene		<0.100	mg/L	100	0.00100
Ethylbenzene		0.518	mg/L	100	0.00100
Xylene (isomers)		0.200	mg/L	100	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		9.13	mg/L	100	0.100	91	78.7 - 110
4-Bromofluorobenzene (4-BFB)		9.17	mg/L	100	0.100	92	77.8 - 110

Sample: 2274 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	352	Date Analyzed:	2003-03-13	Analyzed By:	DK
Prep Batch:	314	Date Prepared:	2003-03-13	Prepared By:	DK

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0978	mg/L	1	0.100	98	78.7 - 110
4-Bromofluorobenzene (4-BFB)		0.0968	mg/L	1	0.100	97	77.8 - 110

Method Blank (1) QC Batch: 352

Parameter	Flag	Result	Units	MDL
Benzene		<0.000410	mg/L	0.00041
Toluene		<0.000760	mg/L	0.00076
Ethylbenzene		<0.00120	mg/L	0.0012
Xylene (isomers)		<0.00362	mg/L	0.00183

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0958	mg/L	1	0.100	96	78.7 - 110
4-Bromofluorobenzene (4-BFB)		0.0942	mg/L	1	0.100	94	77.8 - 110

Method Blank (1) QC Batch: 359

Parameter	Flag	Result	Units	MDL
Benzene		<0.000350	mg/L	0.00035
Toluene		<0.000550	mg/L	0.00055
Ethylbenzene		<0.000690	mg/L	0.00069
Xylene (isomers)		<0.00183	mg/L	0.00183

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0912	mg/L	1	0.100	91	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0782	mg/L	1	0.100	78	72.6 - 130

Method Blank (1) QC Batch: 360

Parameter	Flag	Result	Units	MDL
Sulfate		<0.171	mg/L	0.1709

Method Blank (1) QC Batch: 363

Parameter	Flag	Result	Units	MDL
Sulfate		<0.171	mg/L	0.1709

Method Blank (1) QC Batch: 490

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.4	99	90 - 110	2003-03-17

Standard (CCV-1) QC Batch: 360

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.4	99	90 - 110	2003-03-17

Standard (ICV-1) QC Batch: 363

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.4	99	90 - 110	2003-03-17

Standard (CCV-1) QC Batch: 363

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.3	98	90 - 110	2003-03-17

Standard (ICV-1) QC Batch: 490

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.5	100	90 - 110	2003-03-21

Standard (CCV-1) QC Batch: 490

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Sulfate		mg/L	12.5	12.7	102	90 - 110	2003-03-21

Standard (ICV-1) QC Batch: 520

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1.00	0.985	98	90 - 110	2003-03-24

Standard (ICV-1) QC Batch: 520

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Manganese		mg/L	0.500	0.497	99	90 - 110	2003-03-24

Standard (CCV-1) QC Batch: 520

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1.00	0.971	97	90 - 110	2003-03-24

Standard (CCV-1) QC Batch: 520

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Manganese		mg/L	0.500	0.490	98	90 - 110	2003-03-24

Standard (CCV-2) QC Batch: 520

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1.00	0.972	97	90 - 110	2003-03-24

Standard (CCV-2) QC Batch: 520

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Manganese		mg/L	0.500	0.488	98	90 - 110	2003-03-24

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V-102-0303-1

Chain of Custody

Date 3-11-03 Page 1 of 3

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 806-794-1296

Samplers (SIGNATURES): Gil Van Deventer

Analysis Request

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	SO_4 ~~and NO~~	Fe & Mn					Number of Containers
MW-3 2258	Water	03-10-03	0920		✓														✓	✓					4
MW-1 2259	Water	03-10-03	1020		✓														✓	✓					4
MW-2 2260	Water	03-10-03	1100		✓														✓	✓					4
MW-9 2261	Water	03-10-03	1300		✓														✓	✓					4
MW-8 2262	Water	03-10-03	1400		✓														✓	✓					4
MW-12 2263	Water	03-10-03	1450		✓														✓	✓					4
MW-13 2264	Water	03-10-03	1530		✓														✓	✓					4
MW-11 2265	Water	03-10-03	1600		✓														✓	✓					4
MW-10 2266	Water	03-10-03	1645		✓														✓	✓					4
MW-10d 2267	Water	03-10-03	1726		✓														✓	✓					4

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Gil VanDeventer	(Printed Name)	(Printed Name)
(Signature) Gil Van Deventer	(Signature) Phil Jones	(Signature)
(Date) 3-11-03 (Time) 1000 am	(Date) 3/12/03 (Time) 6:15	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
(Printed Name)	(Printed Name)	(Printed Name)
(Signature)	(Signature) Brenda Ward	(Signature)
(Date) (Time)	(Date) 3/13/03 (Time) 10:15	(Date) (Time)

Special Instructions/Comments: Please send invoice direct to client:

Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

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PHF 3/28/03

3031309

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0303-2

Chain of Custody

Date 3-11-03 Page 2 of 2

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 806-794-1296

Samplers (SIGNATURES): Gil Van Deventer

Analysis Request

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	SO_4	Fe & Mn				Number of Containers
MW-5	2268	Water	03-11-03	1100		✓														✓	✓				4
MW-4	2269	Water	03-11-03	1145		✓														✓	✓				4
MW-6	2270	Water	03-11-03	1220		✓														✓	✓				4
MW-7	2271	Water	03-11-03	1330		✓														✓	✓				4
Rinsate	2272	Water	03-10-03			✓																			2
Duplicate	2273	Water	03-10-03	0000		✓																			2
Trip Blank	2274	Water				✓																			2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental	Trident Environmental	
(Printed Name)	(Printed Name) Gil Van Deventer	(Printed Name)
(Signature)	(Signature) Gil Van Deventer	(Signature) Amy Gomez
(Date) (Time)	(Date) 3-11-03 (Time) 10:00pm	(Date) 3/12/03 (Time) 8:15
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
Gil Van Deventer BAV	80	
(Printed Name) Gil Van Deventer BAV	(Printed Name)	(Printed Name)
(Signature)	(Signature) Brenda Ward	(Signature)
(Date) (Time)	(Date) 3/13/03 (Time) 11:15	(Date) (Time)

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MS

ANALYTICAL REPORT

Prepared for:

GILBERT VAN DEVENTER
TRIDENT ENVIRONMENTAL
P.O. BOX 7624
MIDLAND, TX 79708

Project:	DEFS/ Linam Ranch Plant
PO#:	V-102
Order#:	G0305940
Report Date:	03/13/2003

Certificates
US EPA Laboratory Code TX00158

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

TRIDENT ENVIRONMENTAL
P.O. BOX 7624
MIDLAND, TX 79708
682-0727

Order#: G0305940
Project: V-102
Project Name: DEFS/ Linam Ranch Plant
Location: Linam Ranch Plant

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0305940-01	MW-1	WATER	3/10/03 10:20	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-02	MW-2	WATER	3/10/03 11:00	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-03	MW-3	WATER	3/10/03 9:20	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-04	MW-4	WATER	3/11/03 11:45	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-05	MW-5	WATER	3/11/03 11:00	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-06	MW-6	WATER	3/11/03 12:20	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-07	MW-7	WATER	3/11/03 13:30	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-08	MW-8	WATER	3/10/03 14:00	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

TRIDENT ENVIRONMENTAL
P.O. BOX 7624
MIDLAND, TX 79708
682-0727

Order#: G0305940
Project: V-102
Project Name: DEFS/ Linam Ranch Plant
Location: Linam Ranch Plant

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

Lab ID:	Sample :	Matrix:	Date / Time Collected	Date / Time Received	Container	Preservative
0305940-09	MW-9	WATER	3/10/03 13:00	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-10	MW-10	WATER	3/10/03 16:45	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-11	MW-10d	WATER	3/10/03 17:26	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-12	MW-11	WATER	3/10/03 16:00	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-13	MW-12	WATER	3/10/03 14:50	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		
0305940-14	MW-13	WATER	3/10/03 15:30	3/11/03 17:00	250 ml HDPE	Ice
	Lab Testing: Nitrogen, Nitrate	**Rejected:** No		**Temp:** 1.0 C		

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

GILBERT VAN DEVENTER
TRIDENT ENVIRONMENTAL
P.O. BOX 7624
MIDLAND, TX 79708

Order#: G0305940
Project: V-102
Project Name: DEFS/ Linam Ranch Plant
Location: Linam Ranch Plant

Lab ID: 0305940-01
Sample ID: MW-1

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.10	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-02
Sample ID: MW-2

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.40	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-03
Sample ID: MW-3

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	1.10	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-04
Sample ID: MW-4

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.60	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-05
Sample ID: MW-5

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.50	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-06
Sample ID: MW-6

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.40	mg/L	1	0.10	353.3	3/12/03	SB

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

GILBERT VAN DEVENTER
TRIDENT ENVIRONMENTAL
P.O. BOX 7624
MIDLAND, TX 79708

Order#: G0305940
Project: V-102
Project Name: DEFS/ Linam Ranch Plant
Location: Linam Ranch Plant

Lab ID: 0305940-07
Sample ID: MW-7

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	1.30	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-08
Sample ID: MW-8

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.50	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-09
Sample ID: MW-9

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.10	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-10
Sample ID: MW-10

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.10	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-11
Sample ID: MW-10d

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.10	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-12
Sample ID: MW-11

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.10	mg/L	1	0.10	353.3	3/12/03	SB

RL = Reporting Limit N/A = Not Applicable

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

GILBERT VAN DEVENTER		Order#:	G0305940
TRIDENT ENVIRONMENTAL		Project:	V-102
P.O. BOX 7624		Project Name:	DEFS/ Linam Ranch Plant
MIDLAND, TX 79708		Location:	Linam Ranch Plant

Lab ID: 0305940-13
Sample ID: MW-12

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.20	mg/L	1	0.10	353.3	3/12/03	SB

Lab ID: 0305940-14
Sample ID: MW-13

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Nitrogen, Nitrate	0.50	mg/L	1	0.10	353.3	3/12/03	SB

Approval: Raland K Tuttle 3-14-03
Raland K. Tuttle, Lab Director, QA Officer — Date
Celey D. Keene, Org. Tech. Director
Jeanne McMurrey, Inorg. Tech. Director
Sandra Biezugbe, Lab Tech.
Sara Molina, Lab Tech.

RL = Reporting Limit **N/A = Not Applicable**

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ENVIRONMENTAL LAB OF TEXAS

QUALITY CONTROL REPORT

Test Parameters

Order#: G0305940

BLANK WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Nitrogen, Nitrate-mg/L	0004911-01			<0.10		
DUPLICATE WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Nitrogen, Nitrate-mg/L	0305940-01	0.1		0.10		0.%
SRM WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Nitrogen, Nitrate-mg/L	0004911-04		2	1.90	95.%	

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0303-3

Chain of Custody

Date 3-11-03 Page 1 of 2

Lab Name: Environmental Lab of Texas
Address: 12600 W I-20 East
Odessa, Texas 79765
Telephone: (915) 563-1800

Samplers (SIGNATURES)

0305940

Analysis Request

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	~~Selenium~~ NO_3						Number of Containers
MW-1	-01	Water	03-10-03	1020																✓						1
MW-2	02	Water	03-10-03	1100																✓						1
MW-3	03	Water	03-10-03	0920																✓						1
MW-4	04	Water	03-11-03	1145																✓						1
MW-5	05	Water	03-11-03	1100																✓						1
MW-6	06	Water	03-11-03	1220																✓						1
MW-7	07	Water	03-11-03	1330																✓						1
MW-8	08	Water	03-10-03	1400																✓						1
MW-9	09	Water	03-10-03	1300																✓						1
MW-10	10	Water	03-10-03	1645																✓						1

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	1.0°C
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.: 250mL HDPE / ICE	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Gil VanDeventer	(Printed Name)	(Printed Name)
(Signature) [signature]	(Signature)	(Signature)
(Date) 3-11-03 (Time) 5:00pm	(Date) (Time)	(Date) (Time)
Received By: (1) (Company) Env. Lab of Tx	**Received By: (2) (Company)**	**Received By: (3) (Company)**
(Printed Name) Jeanne McMurrey	(Printed Name)	(Printed Name)
(Signature) [signature]	(Signature)	(Signature)
(Date) 03-11-03 (Time) 1700	(Date) (Time)	(Date) (Time)

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Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0303-4

Chain of Custody

Date 3-11-03 Page 2 of 2

Lab Name: Environmental Lab of Texas
Address: 12600 W I-20 East
Odessa, Texas 79765
Telephone: (915) 563-1800

Samplers (SIGNATURES)

0306940

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	~~SO_4 and~~ NO_3						Number of Containers
MW-10d 11	Water	03-10-03	1726																✓						1
MW-11 12	Water	03-10-03	1600																✓						1
MW-12 13	Water	03-10-03	1450																✓						1
MW-13 14	Water	03-10-03	1530																✓						1

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	1.0°C
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.: 250 mL HDPE ICE	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Gil Van Deventer	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) 3-11-03 (Time) 5:00pm	(Date) (Time)	(Date) (Time)
Received By: (1) (Company) Env. Lab of Tx	**Received By: (2) (Company)**	**Received By: (3) (Company)**
(Printed Name) Jeanne McMurrey	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) 3-11-3 (Time) 1700	(Date) (Time)	(Date) (Time)

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Summary Report

Dale Littlejohn
Trident Environmental
P.O. Box 7624
Midland, TX 79708

Report Date: October 9, 2003

Work Order: 3092105

Cost Center #: V-102
Project Location: Linam Ranch Plant
Project Name: Duke energy Field Services

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
17774	MW-1	water	2003-09-17	15:16	2003-09-20
17775	MW-2	water	2003-09-17	11:00	2003-09-20
17776	MW-3	water	2003-09-17	11:30	2003-09-20
17777	MW-4	water	2003-09-17	10:15	2003-09-20
17778	MW-5	water	2003-09-18	10:20	2003-09-20
17779	MW-7	water	2003-09-17	08:25	2003-09-20
17780	MW-8	water	2003-09-17	14:40	2003-09-20
17781	MW-9	water	2003-09-18	09:30	2003-09-20
17782	MW-10	water	2003-09-18	08:10	2003-09-20
17783	MW-10d	water	2003-09-18	09:30	2003-09-20
17784	MW-11	water	2003-09-17	18:00	2003-09-20
17785	MW-12	water	2003-09-17	16:10	2003-09-20
17786	MW-13	water	2003-09-17	16:40	2003-09-20
17787	Duplicate	water	2003-09-17	00:00	2003-09-20
17788	Rinsate	water	2003-09-17	18:10	2003-09-20
17789	Trip Blank (4132)	water	2003-09-18	00:00	2003-09-20

	BTEX			
Sample - Field Code	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylene (isomers) (mg/L)
17774 - MW-1	<0.00100	<0.00100	<0.00100	<0.00100
17775 - MW-2	<0.00100	<0.00100	<0.00100	<0.00100
17776 - MW-3	<0.00100	<0.00100	<0.00100	<0.00100
17777 - MW-4	15.8	<0.200	0.259	<0.200
17778 - MW-5	0.116	<0.00100	0.182	<0.00100
17779 - MW-7	<0.00100	<0.00100	<0.00100	<0.00100
17780 - MW-8	<0.00500	<0.00500	<0.00500	<0.00500
17781 - MW-9	<0.00500	<0.00500	<0.00500	<0.00500
17782 - MW-10	1.34	0.00580	0.110	0.0438
17783 - MW-10d	<0.00500	<0.00500	<0.00500	<0.00500
17784 - MW-11	<0.00500	<0.00500	<0.00500	<0.00500
17785 - MW-12	<0.00500	<0.00500	<0.00500	<0.00500
17786 - MW-13	<0.00500	<0.00500	<0.00500	<0.00500
17787 - Duplicate	<0.00500	<0.00500	<0.00500	<0.00500
17788 - Rinsate	<0.00500	<0.00500	<0.00500	<0.00500
17789 - Trip Blank (4132)	<0.00100	<0.00100	<0.00100	<0.00100

Sample: 17774 - MW-1

Param	Flag	Result	Units	RL
Total Arsenic		0.117	mg/L	0.0100
Total Barium		0.0530	mg/L	0.0100
Chloride		54.9	mg/L	0.500
Total Iron		0.0990	mg/L	0.0500
Total Manganese		0.242	mg/L	0.0250
Total Dissolved Solids		1410	mg/L	10.00

Sample: 17775 - MW-2

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.197	mg/L	0.0100
Chloride		16.5	mg/L	0.500
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Total Dissolved Solids		477.0	mg/L	10.00

Sample: 17776 - MW-3

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.0890	mg/L	0.0100
Chloride		11.7	mg/L	0.500
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Total Dissolved Solids		345.0	mg/L	10.00

Sample: 17777 - MW-4

Param	Flag	Result	Units	RL
Total Arsenic		0.119	mg/L	0.0100
Total Barium		0.781	mg/L	0.0100
Chloride		691	mg/L	0.500
Total Iron		12.6	mg/L	0.0500
Total Manganese		0.113	mg/L	0.0250
Total Dissolved Solids		1836	mg/L	10.00

Sample: 17778 - MW-5

Param	Flag	Result	Units	RL
Total Arsenic		0.0820	mg/L	0.0100
Total Barium		0.850	mg/L	0.0100
Chloride		215	mg/L	0.500
Total Iron		8.02	mg/L	0.0500
Total Manganese		0.586	mg/L	0.0250
Total Dissolved Solids		1310	mg/L	10.00

Sample: 17779 - MW-7

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.0650	mg/L	0.0100
Chloride		95.6	mg/L	0.500
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Total Dissolved Solids		659.0	mg/L	10.00

Sample: 17780 - MW-8

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.138	mg/L	0.0100
Chloride		38.8	mg/L	0.500
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		<0.0250	mg/L	0.0250
Total Dissolved Solids		799.0	mg/L	10.00

Sample: 17781 - MW-9

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.135	mg/L	0.0100
Chloride		66.6	mg/L	0.500
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		0.0470	mg/L	0.0250
Total Dissolved Solids		734.0	mg/L	10.00

Sample: 17782 - MW-10

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.152	mg/L	0.0100
Chloride		78.2	mg/L	0.500
Total Iron		0.886	mg/L	0.0500
Total Manganese		0.422	mg/L	0.0250
Total Dissolved Solids		1076	mg/L	10.00

Sample: 17783 - MW-10d

Param	Flag	Result	Units	RL
Total Arsenic		0.0730	mg/L	0.0100
Total Barium		0.0670	mg/L	0.0100
Chloride		93.0	mg/L	0.500
Total Iron		0.561	mg/L	0.0500
Total Manganese		0.313	mg/L	0.0250
Total Dissolved Solids		1088	mg/L	10.00

Sample: 17784 - MW-11

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.0840	mg/L	0.0100
Chloride		73.1	mg/L	0.500
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		0.142	mg/L	0.0250
Total Dissolved Solids		844.0	mg/L	10.00

Sample: 17785 - MW-12

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.0620	mg/L	0.0100
Chloride		65.6	mg/L	0.500
Total Iron		<0.0500	mg/L	0.0500
Total Manganese		0.0270	mg/L	0.0250
Total Dissolved Solids		996.0	mg/L	10.00

Sample: 17786 - MW-13

Param	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.0100
Total Barium		0.126	mg/L	0.0100
Chloride		267	mg/L	0.500
Total Iron		0.159	mg/L	0.0500
Total Manganese		0.170	mg/L	0.0250
Total Dissolved Solids		1198	mg/L	10.00

TRACEANALYSIS, INC.

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Analytical and Quality Control Report

Dale Littlejohn
Trident Environmental
P.O. Box 7624
Midland, TX 79708

Report Date: October 9, 2003

Work Order: 3092105

Cost Center #: V-102
Project Location: Linam Ranch Plant
Project Name: Duke energy Field Services
Project Number: Linam Ranch Plant

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
17774	MW-1	water	2003-09-17	15:16	2003-09-20
17775	MW-2	water	2003-09-17	11:00	2003-09-20
17776	MW-3	water	2003-09-17	11:30	2003-09-20
17777	MW-4	water	2003-09-17	10:15	2003-09-20
17778	MW-5	water	2003-09-18	10:20	2003-09-20
17779	MW-7	water	2003-09-17	08:25	2003-09-20
17780	MW-8	water	2003-09-17	14:40	2003-09-20
17781	MW-9	water	2003-09-18	09:30	2003-09-20
17782	MW-10	water	2003-09-18	08:10	2003-09-20
17783	MW-10d	water	2003-09-18	09:30	2003-09-20
17784	MW-11	water	2003-09-17	18:00	2003-09-20
17785	MW-12	water	2003-09-17	16:10	2003-09-20
17786	MW-13	water	2003-09-17	16:40	2003-09-20
17787	Duplicate	water	2003-09-17	00:00	2003-09-20
17788	Rinsate	water	2003-09-17	18:10	2003-09-20
17789	Trip Blank (4132)	water	2003-09-18	00:00	2003-09-20

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 40 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 17774 - MW-1

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		0.117	mg/L	1	0.0100

Sample: 17774 - MW-1

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.0530	mg/L	1	0.0100

Sample: 17774 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4608	Date Analyzed:	2003-09-23	Analyzed By:	BS
Prep Batch:	4097	Date Prepared:	2003-09-23	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0987	mg/L	1	0.100	99	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0909	mg/L	1	0.100	91	72.6 - 130

Sample: 17774 - MW-1

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4076	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		54.9	mg/L	10	0.500

Sample: 17774 - MW-1

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		0.0990	mg/L	1	0.0500

Sample: 17774 - MW-1

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.242	mg/L	1	0.0250

Sample: 17774 - MW-1

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4561	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4089	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1410	mg/L	2	10.00

Sample: 17775 - MW-2

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17775 - MW-2

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.197	mg/L	1	0.0100

Sample: 17775 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4608	Date Analyzed:	2003-09-23	Analyzed By:	BS
Prep Batch:	4097	Date Prepared:	2003-09-23	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0964	mg/L	1	0.100	96	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0895	mg/L	1	0.100	90	72.6 - 130

Sample: 17775 - MW-2

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4076	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		16.5	mg/L	5	0.500

Sample: 17775 - MW-2

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		<0.0500	mg/L	1	0.0500

Sample: 17775 - MW-2

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 17775 - MW-2

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4561	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4089	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		477.0	mg/L	1	10.00

Sample: 17776 - MW-3

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17776 - MW-3

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.0890	mg/L	1	0.0100

Sample: 17776 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4608	Date Analyzed:	2003-09-23	Analyzed By:	BS
Prep Batch:	4097	Date Prepared:	2003-09-23	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0980	mg/L	1	0.100	98	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0895	mg/L	1	0.100	90	72.6 - 130

Sample: 17776 - MW-3

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW

Prep Batch: 4076 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		11.7	mg/L	1	0.500

Sample: 17776 - MW-3

Analysis: Fe, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		<0.0500	mg/L	1	0.0500

Sample: 17776 - MW-3

Analysis: Mn, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 17776 - MW-3

Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 4561 Date Analyzed: 2003-09-23 Analyzed By: JSW
Prep Batch: 4089 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		345.0	mg/L	1	10.00

Sample: 17777 - MW-4

Analysis: As, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		0.119	mg/L	1	0.0100

Sample: 17777 - MW-4

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.781	mg/L	1	0.0100

Sample: 17777 - MW-4

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4672	Date Analyzed:	2003-09-25	Analyzed By:	BS
Prep Batch:	4193	Date Prepared:	2003-09-25	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		15.8	mg/L	200	0.00100
Toluene		<0.200	mg/L	200	0.00100
Ethylbenzene		0.259	mg/L	200	0.00100
Xylene (isomers)		<0.200	mg/L	200	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		16.7	mg/L	200	0.100	84	70 - 130
4-Bromofluorobenzene (4-BFB)		14.4	mg/L	200	0.100	72	70 - 130

Sample: 17777 - MW-4

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4076	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		691	mg/L	50	0.500

Sample: 17777 - MW-4

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		12.6	mg/L	1	0.0500

Sample: 17777 - MW-4

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR

Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.113	mg/L	1	0.0250

Sample: 17777 - MW-4

Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 4561 Date Analyzed: 2003-09-23 Analyzed By: JSW
Prep Batch: 4089 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1836	mg/L	2	10.00

Sample: 17778 - MW-5

Analysis: As, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		0.0820	mg/L	1	0.0100

Sample: 17778 - MW-5

Analysis: Ba, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.850	mg/L	1	0.0100

Sample: 17778 - MW-5

Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5030B
QC Batch: 4608 Date Analyzed: 2003-09-23 Analyzed By: BS
Prep Batch: 4097 Date Prepared: 2003-09-23 Prepared By: BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		0.116	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		0.182	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	[1]	0.139	mg/L	1	0.100	139	61 - 127
4-Bromofluorobenzene (4-BFB)		0.113	mg/L	1	0.100	113	72.6 - 130

Sample: 17778 - MW-5

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4076	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		215	mg/L	10	0.500

Sample: 17778 - MW-5

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		8.02	mg/L	1	0.0500

Sample: 17778 - MW-5

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.586	mg/L	1	0.0250

Sample: 17778 - MW-5

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4562	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4090	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1310	mg/L	2	10.00

Sample: 17779 - MW-7

[1]High surrogate recovery due to peak interference.

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17779 - MW-7

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.0650	mg/L	1	0.0100

Sample: 17779 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4608	Date Analyzed:	2003-09-23	Analyzed By:	BS
Prep Batch:	4097	Date Prepared:	2003-09-23	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.102	mg/L	1	0.100	102	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0877	mg/L	1	0.100	88	72.6 - 130

Sample: 17779 - MW-7

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4076	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		95.6	mg/L	5	0.500

Sample: 17779 - MW-7

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR

Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		<0.0500	mg/L	1	0.0500

Sample: 17779 - MW-7

Analysis: Mn, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 17779 - MW-7

Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 4562 Date Analyzed: 2003-09-23 Analyzed By: JSW
Prep Batch: 4090 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		659.0	mg/L	1	10.00

Sample: 17780 - MW-8

Analysis: As, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17780 - MW-8

Analysis: Ba, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.138	mg/L	1	0.0100

Sample: 17780 - MW-8

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4699	Date Analyzed:	2003-09-26	Analyzed By:	MT
Prep Batch:	4215	Date Prepared:	2003-09-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.525	mg/L	5	0.100	105	61 - 127
4-Bromofluorobenzene (4-BFB)		0.477	mg/L	5	0.100	95	72.6 - 130

Sample: 17780 - MW-8

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4076	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		38.8	mg/L	10	0.500

Sample: 17780 - MW-8

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		<0.0500	mg/L	1	0.0500

Sample: 17780 - MW-8

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		<0.0250	mg/L	1	0.0250

Sample: 17780 - MW-8

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4562	Date Analyzed:	2003-09-23	Analyzed By:	JSW

Prep Batch: 4090 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		799.0	mg/L	1	10.00

Sample: 17781 - MW-9

Analysis: As, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17781 - MW-9

Analysis: Ba, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.135	mg/L	1	0.0100

Sample: 17781 - MW-9

Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5030B
QC Batch: 4699 Date Analyzed: 2003-09-26 Analyzed By: MT
Prep Batch: 4215 Date Prepared: 2003-09-26 Prepared By: MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.547	mg/L	5	0.100	109	61 - 127
4-Bromofluorobenzene (4-BFB)		0.496	mg/L	5	0.100	99	72.6 - 130

Sample: 17781 - MW-9

Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 4547 Date Analyzed: 2003-09-23 Analyzed By: JSW
Prep Batch: 4076 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		66.6	mg/L	10	0.500

Sample: 17781 - MW-9

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		<0.0500	mg/L	1	0.0500

Sample: 17781 - MW-9

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.0470	mg/L	1	0.0250

Sample: 17781 - MW-9

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4562	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4090	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		734.0	mg/L	1	10.00

Sample: 17782 - MW-10

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17782 - MW-10

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR

Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.152	mg/L	1	0.0100

Sample: 17782 - MW-10

Analysis: BTEX Analytical Method: S 8021B Prep Method: S 5030B
QC Batch: 4699 Date Analyzed: 2003-09-26 Analyzed By: MT
Prep Batch: 4215 Date Prepared: 2003-09-26 Prepared By: MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		1.34	mg/L	5	0.00100
Toluene		0.00580	mg/L	5	0.00100
Ethylbenzene		0.110	mg/L	5	0.00100
Xylene (isomers)		0.0438	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.326	mg/L	5	0.100	65	61 - 127
4-Bromofluorobenzene (4-BFB)		0.488	mg/L	5	0.100	98	72.6 - 130

Sample: 17782 - MW-10

Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 4547 Date Analyzed: 2003-09-23 Analyzed By: JSW
Prep Batch: 4076 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		78.2	mg/L	10	0.500

Sample: 17782 - MW-10

Analysis: Fe, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		0.886	mg/L	1	0.0500

Sample: 17782 - MW-10

Analysis: Mn, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4943 Date Analyzed: 2003-10-08 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.422	mg/L	1	0.0250

Sample: 17782 - MW-10

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4562	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4090	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1076	mg/L	2	10.00

Sample: 17783 - MW-10d

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		0.0730	mg/L	1	0.0100

Sample: 17783 - MW-10d

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.0670	mg/L	1	0.0100

Sample: 17783 - MW-10d

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4699	Date Analyzed:	2003-09-26	Analyzed By:	MT
Prep Batch:	4215	Date Prepared:	2003-09-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.537	mg/L	5	0.100	107	61 - 127
4-Bromofluorobenzene (4-BFB)		0.480	mg/L	5	0.100	96	72.6 - 130

Sample: 17783 - MW-10d

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4547	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4076	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		93.0	mg/L	10	0.500

Sample: 17783 - MW-10d

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		0.561	mg/L	1	0.0500

Sample: 17783 - MW-10d

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4943	Date Analyzed:	2003-10-08	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.313	mg/L	1	0.0250

Sample: 17783 - MW-10d

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4562	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4090	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1088	mg/L	2	10.00

Sample: 17784 - MW-11

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A

QC Batch: 4953 | Date Analyzed: 2003-10-09 | Analyzed By: RR
Prep Batch: 4095 | Date Prepared: 2003-09-23 | Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17784 - MW-11

Analysis: Ba, Total | Analytical Method: S 6010B | Prep Method: S 3010A
QC Batch: 4953 | Date Analyzed: 2003-10-09 | Analyzed By: RR
Prep Batch: 4095 | Date Prepared: 2003-09-23 | Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.0840	mg/L	1	0.0100

Sample: 17784 - MW-11

Analysis: BTEX | Analytical Method: S 8021B | Prep Method: S 5030B
QC Batch: 4699 | Date Analyzed: 2003-09-26 | Analyzed By: MT
Prep Batch: 4215 | Date Prepared: 2003-09-26 | Prepared By: MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.542	mg/L	5	0.100	108	61 - 127
4-Bromofluorobenzene (4-BFB)		0.488	mg/L	5	0.100	98	72.6 - 130

Sample: 17784 - MW-11

Analysis: Chloride (IC) | Analytical Method: E 300.0 | Prep Method: N/A
QC Batch: 4548 | Date Analyzed: 2003-09-23 | Analyzed By: JSW
Prep Batch: 4077 | Date Prepared: 2003-09-22 | Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		73.1	mg/L	10	0.500

Sample: 17784 - MW-11

Analysis: Fe, Total | Analytical Method: S 6010B | Prep Method: S 3010A
QC Batch: 4953 | Date Analyzed: 2003-10-09 | Analyzed By: RR
Prep Batch: 4095 | Date Prepared: 2003-09-23 | Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		<0.0500	mg/L	1	0.0500

Sample: 17784 - MW-11

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4953	Date Analyzed:	2003-10-09	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.142	mg/L	1	0.0250

Sample: 17784 - MW-11

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4562	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4090	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		844.0	mg/L	2	10.00

Sample: 17785 - MW-12

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4953	Date Analyzed:	2003-10-09	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17785 - MW-12

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4953	Date Analyzed:	2003-10-09	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.0620	mg/L	1	0.0100

Sample: 17785 - MW-12

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4700	Date Analyzed:	2003-09-26	Analyzed By:	MT

Prep Batch: 4216 Date Prepared: 2003-09-26 Prepared By: MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.559	mg/L	5	0.100	112	61 - 127
4-Bromofluorobenzene (4-BFB)		0.500	mg/L	5	0.100	100	72.6 - 130

Sample: 17785 - MW-12

Analysis: Chloride (IC) Analytical Method: E 300.0 Prep Method: N/A
QC Batch: 4548 Date Analyzed: 2003-09-23 Analyzed By: JSW
Prep Batch: 4077 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		65.6	mg/L	10	0.500

Sample: 17785 - MW-12

Analysis: Fe, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4953 Date Analyzed: 2003-10-09 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		<0.0500	mg/L	1	0.0500

Sample: 17785 - MW-12

Analysis: Mn, Total Analytical Method: S 6010B Prep Method: S 3010A
QC Batch: 4953 Date Analyzed: 2003-10-09 Analyzed By: RR
Prep Batch: 4095 Date Prepared: 2003-09-23 Prepared By: TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.0270	mg/L	1	0.0250

Sample: 17785 - MW-12

Analysis: TDS Analytical Method: SM 2540C Prep Method: N/A
QC Batch: 4562 Date Analyzed: 2003-09-23 Analyzed By: JSW
Prep Batch: 4090 Date Prepared: 2003-09-22 Prepared By: JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		996.0	mg/L	2	10.00

Sample: 17786 - MW-13

Analysis:	As, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4953	Date Analyzed:	2003-10-09	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Arsenic		<0.0100	mg/L	1	0.0100

Sample: 17786 - MW-13

Analysis:	Ba, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4953	Date Analyzed:	2003-10-09	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Barium		0.126	mg/L	1	0.0100

Sample: 17786 - MW-13

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4700	Date Analyzed:	2003-09-26	Analyzed By:	MT
Prep Batch:	4216	Date Prepared:	2003-09-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.538	mg/L	5	0.100	108	61 - 127
4-Bromofluorobenzene (4-BFB)		0.473	mg/L	5	0.100	94	72.6 - 130

Sample: 17786 - MW-13

Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method:	N/A
QC Batch:	4548	Date Analyzed:	2003-09-23	Analyzed By:	JSW
Prep Batch:	4077	Date Prepared:	2003-09-22	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		267	mg/L	10	0.500

Sample: 17786 - MW-13

Analysis:	Fe, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4953	Date Analyzed:	2003-10-09	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Iron		0.159	mg/L	1	0.0500

Sample: 17786 - MW-13

Analysis:	Mn, Total	Analytical Method:	S 6010B	Prep Method:	S 3010A
QC Batch:	4953	Date Analyzed:	2003-10-09	Analyzed By:	RR
Prep Batch:	4095	Date Prepared:	2003-09-23	Prepared By:	TP

Parameter	Flag	RL Result	Units	Dilution	RL
Total Manganese		0.170	mg/L	1	0.0250

Sample: 17786 - MW-13

Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method:	N/A
QC Batch:	4598	Date Analyzed:	2003-09-25	Analyzed By:	JSW
Prep Batch:	4122	Date Prepared:	2003-09-24	Prepared By:	JSW

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		1198	mg/L	1	10.00

Sample: 17787 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4700	Date Analyzed:	2003-09-26	Analyzed By:	MT
Prep Batch:	4216	Date Prepared:	2003-09-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.549	mg/L	5	0.100	110	61 - 127
4-Bromofluorobenzene (4-BFB)		0.482	mg/L	5	0.100	96	72.6 - 130

Sample: 17788 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4700	Date Analyzed:	2003-09-26	Analyzed By:	MT
Prep Batch:	4216	Date Prepared:	2003-09-26	Prepared By:	MT

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00500	mg/L	5	0.00100
Toluene		<0.00500	mg/L	5	0.00100
Ethylbenzene		<0.00500	mg/L	5	0.00100
Xylene (isomers)		<0.00500	mg/L	5	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.522	mg/L	5	0.100	104	61 - 127
4-Bromofluorobenzene (4-BFB)		0.465	mg/L	5	0.100	93	72.6 - 130

Sample: 17789 - Trip Blank (4132)

Analysis:	BTEX	Analytical Method:	S 8021B	Prep Method:	S 5030B
QC Batch:	4645	Date Analyzed:	2003-09-23	Analyzed By:	BS
Prep Batch:	4098	Date Prepared:	2003-09-23	Prepared By:	BS

Parameter	Flag	RL Result	Units	Dilution	RL
Benzene		<0.00100	mg/L	1	0.00100
Toluene		<0.00100	mg/L	1	0.00100
Ethylbenzene		<0.00100	mg/L	1	0.00100
Xylene (isomers)		<0.00100	mg/L	1	0.00100

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0975	mg/L	1	0.100	98	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0878	mg/L	1	0.100	88	72.6 - 130

Method Blank (1) QC Batch: 4547

Parameter	Flag	Result	Units	RL
Chloride		<0.500	mg/L	0.5

Method Blank (1) QC Batch: 4548

Parameter	Flag	Result	Units	RL
Chloride		<0.500	mg/L	0.5

Method Blank (1) QC Batch: 4561

Parameter	Flag	Result	Units	RL
Total Dissolved Solids		<10.00	mg/L	10

Method Blank (1) QC Batch: 4562

Parameter	Flag	Result	Units	RL
Total Dissolved Solids		<10.00	mg/L	10

Method Blank (1) QC Batch: 4598

Parameter	Flag	Result	Units	RL
Total Dissolved Solids		<10.00	mg/L	10

Method Blank (1) QC Batch: 4608

Parameter	Flag	Result	Units	RL
Benzene		<0.00100	mg/L	0.001
Toluene		<0.00100	mg/L	0.001
Ethylbenzene		<0.00100	mg/L	0.001
Xylene (isomers)		<0.00100	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.0966	mg/L	1	0.100	97	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0875	mg/L	1	0.100	88	72.6 - 130

Method Blank (1) QC Batch: 4645

Parameter	Flag	Result	Units	RL
Benzene		<0.00100	mg/L	0.001
Toluene		<0.00100	mg/L	0.001
Ethylbenzene		<0.00100	mg/L	0.001
Xylene (isomers)		<0.00100	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.103	mg/L	1	0.100	103	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0940	mg/L	1	0.100	94	72.6 - 130

Method Blank (1) QC Batch: 4672

Parameter	Flag	Result	Units	RL
Benzene		<0.00100	mg/L	0.001
Toluene		<0.00100	mg/L	0.001
Ethylbenzene		<0.00100	mg/L	0.001
Xylene (isomers)		<0.00100	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)	[2]	0.0685	mg/L	1	0.100	68	70 - 130
4-Bromofluorobenzene (4-BFB)		0.0702	mg/L	1	0.100	70	70 - 130

Method Blank (1) QC Batch: 4699

Parameter	Flag	Result	Units	RL
Benzene		<0.00100	mg/L	0.001
Toluene		<0.00100	mg/L	0.001
Ethylbenzene		<0.00100	mg/L	0.001
Xylene (isomers)		<0.00100	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.103	mg/L	1	0.100	103	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0941	mg/L	1	0.100	94	72.6 - 130

Method Blank (1) QC Batch: 4700

Parameter	Flag	Result	Units	RL
Benzene		<0.00100	mg/L	0.001
Toluene		<0.00100	mg/L	0.001
Ethylbenzene		<0.00100	mg/L	0.001
Xylene (isomers)		<0.00100	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Trifluorotoluene (TFT)		0.107	mg/L	1	0.100	107	61 - 127
4-Bromofluorobenzene (4-BFB)		0.0960	mg/L	1	0.100	96	72.6 - 130

Method Blank (1) QC Batch: 4943

[2]Low TFT surrogate recovery due to unknown anomaly. BFB surrogate recovery shows the method to be in control.

Parameter	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.01

Method Blank (1) QC Batch: 4943

Parameter	Flag	Result	Units	RL
Total Barium		<0.0100	mg/L	0.01

Method Blank (1) QC Batch: 4943

Parameter	Flag	Result	Units	RL
Total Iron		<0.0500	mg/L	0.05

Method Blank (1) QC Batch: 4943

Parameter	Flag	Result	Units	RL
Total Manganese		<0.0250	mg/L	0.025

Method Blank (1) QC Batch: 4953

Parameter	Flag	Result	Units	RL
Total Arsenic		<0.0100	mg/L	0.01

Method Blank (1) QC Batch: 4953

Parameter	Flag	Result	Units	RL
Total Barium		<0.0100	mg/L	0.01

Method Blank (1) QC Batch: 4953

Parameter	Flag	Result	Units	RL
Total Iron		<0.0500	mg/L	0.05

Method Blank (1) QC Batch: 4953

Parameter	Flag	Result	Units	RL
Total Manganese		<0.0250	mg/L	0.025

Duplicate (1) QC Batch: 4561

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1602	1516	mg/L	2	6	14.2

Duplicate (1) QC Batch: 4562

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	67300	65100	mg/L	100	3	14.2

Duplicate (1) QC Batch: 4598

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	1090	1048	mg/L	1	4	14.2

Laboratory Control Spike (LCS-1) QC Batch: 4547

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Chloride	12.0	11.9	mg/L	1	12.5	<1.49	96	1	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4548

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Chloride	12.1	11.8	mg/L	1	12.5	<1.49	97	2	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4608

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0972	0.0987	mg/L	1	0.100	<0.000350	97	2	81.2 - 118	20
Benzene	0.0972	0.0987	mg/L	1	0.100	<0.000350	97	2	81.2 - 118	20
Toluene	0.0969	0.0985	mg/L	1	0.100	<0.000550	97	2	81.2 - 118	20
Toluene	0.0969	0.0985	mg/L	1	0.100	<0.000550	97	2	81.2 - 118	20

continued ...

control spikes continued ...

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Ethylbenzene	0.0975	0.0988	mg/L	1	0.100	<0.000690	98	1	80.7 - 122	20
Ethylbenzene	0.0975	0.0988	mg/L	1	0.100	<0.000690	98	1	80.7 - 122	20
Xylene (isomers)	0.289	0.294	mg/L	1	0.300	<0.000610	96	2	79.8 - 118	20
Xylene (isomers)	0.289	0.294	mg/L	1	0.300	<0.000610	96	2	79.8 - 118	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0964	0.0962	mg/L	1	0.100	96	96	69.5 - 125
Trifluorotoluene (TFT)	0.0964	0.0962	mg/L	1	0.100	96	96	69.5 - 125
4-Bromofluorobenzene (4-BFB)	0.0954	0.0941	mg/L	1	0.100	95	94	66.2 - 129
4-Bromofluorobenzene (4-BFB)	0.0954	0.0941	mg/L	1	0.100	95	94	66.2 - 129

Laboratory Control Spike (LCS-1) QC Batch: 4645

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0976	0.0978	mg/L	1	0.100	<0.000350	98	0	81.2 - 118	20
Toluene	0.0968	0.0974	mg/L	1	0.100	<0.000550	97	1	81.2 - 118	20
Ethylbenzene	0.0964	0.0963	mg/L	1	0.100	<0.000690	96	0	80.7 - 122	20
Xylene (isomers)	0.286	0.286	mg/L	1	0.300	<0.000610	95	0	79.8 - 118	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0924	0.0958	mg/L	1	0.100	92	96	69.5 - 125
4-Bromofluorobenzene (4-BFB)	0.0924	0.0926	mg/L	1	0.100	92	93	66.2 - 129

Laboratory Control Spike (LCS-1) QC Batch: 4672

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.0916	0.0920	mg/L	1	0.100	<0.000650	92	0	65.9 - 129	20
Toluene	0.0915	0.0913	mg/L	1	0.100	<0.00101	92	0	74.1 - 122	20
Ethylbenzene	0.0944	0.0939	mg/L	1	0.100	<0.000840	94	0	68 - 125	20
Xylene (isomers)	0.295	0.294	mg/L	1	0.300	<0.000737	98	0	67 - 122	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.0809	0.0784	mg/L	1	0.100	81	78	52.9 - 135
4-Bromofluorobenzene (4-BFB)	0.0887	0.0930	mg/L	1	0.100	89	93	45.5 - 147

Laboratory Control Spike (LCS-1) QC Batch: 4699

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.101	0.106	mg/L	1	0.100	<0.000350	101	5	81.2 - 118	20
Benzene	0.101	0.106	mg/L	1	0.100	<0.000350	101	5	81.2 - 118	20
Toluene	0.102	0.105	mg/L	1	0.100	<0.000550	102	3	81.2 - 118	20
Toluene	0.102	0.105	mg/L	1	0.100	<0.000550	102	3	81.2 - 118	20
Ethylbenzene	0.101	0.105	mg/L	1	0.100	<0.000690	101	4	80.7 - 122	20
Ethylbenzene	0.101	0.105	mg/L	1	0.100	<0.000690	101	4	80.7 - 122	20
Xylene (isomers)	0.298	0.312	mg/L	1	0.300	<0.000610	99	4	79.8 - 118	20
Xylene (isomers)	0.298	0.312	mg/L	1	0.300	<0.000610	99	4	79.8 - 118	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.101	0.106	mg/L	1	0.100	101	106	69.5 - 125
Trifluorotoluene (TFT)	0.101	0.106	mg/L	1	0.100	101	106	69.5 - 125
4-Bromofluorobenzene (4-BFB)	0.101	0.106	mg/L	1	0.100	101	106	66.2 - 129
4-Bromofluorobenzene (4-BFB)	0.101	0.106	mg/L	1	0.100	101	106	66.2 - 129

Laboratory Control Spike (LCS-1) QC Batch: 4700

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Benzene	0.103	0.106	mg/L	1	0.100	<0.000350	103	2	81.2 - 118	20
Toluene	0.103	0.106	mg/L	1	0.100	<0.000550	103	3	81.2 - 118	20
Ethylbenzene	0.103	0.106	mg/L	1	0.100	<0.000690	103	3	80.7 - 122	20
Xylene (isomers)	0.306	0.313	mg/L	1	0.300	<0.000610	102	2	79.8 - 118	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dil.	Spike Amount	LCS Rec.	LCSD Rec.	Rec. Limit
Trifluorotoluene (TFT)	0.101	0.106	mg/L	1	0.100	101	106	69.5 - 125
4-Bromofluorobenzene (4-BFB)	0.0998	0.105	mg/L	1	0.100	100	105	66.2 - 129

Laboratory Control Spike (LCS-1) QC Batch: 4943

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Arsenic	0.547	0.533	mg/L	1	0.500	<0.00593	109	2	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4943

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Barium	0.887	0.888	mg/L	1	1.00	<0.000343	89	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4943

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Iron	0.470	0.472	mg/L	1	0.500	<0.00220	94	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4943

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Manganese	0.228	0.229	mg/L	1	0.250	<0.000275	91	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4953

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Arsenic	0.547	<0.00593	mg/L	1	0.500	<0.00593	109		80 - 120	20
Total Arsenic	0.547	0.533	mg/L	1	0.500	<0.00593	109	2	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4953

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Barium	0.887	<0.000343	mg/L	1	1.00	<0.000343	89		85 - 115	20
Total Barium	0.887	0.888	mg/L	1	1.00	<0.000343	89	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4953

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Iron	0.470	<0.00220	mg/L	1	0.500	<0.00220	94		85 - 115	20
Total Iron	0.470	0.472	mg/L	1	0.500	<0.00220	94	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spike (LCS-1) QC Batch: 4953

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Manganese	0.228	0.229	mg/L	1	0.250	<0.000275	91	0	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4547

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Chloride	1310	1310	mg/L	50	12.5	691	99	0	56.4 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4548

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Chloride	3430	3440	mg/L	100	12.5	2230	96	0	56.4 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4943

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Arsenic	0.642	0.651	mg/L	1	0.500	0.117	105	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4943

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Barium	0.953	0.963	mg/L	1	1.00	0.053	90	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4943

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Iron	0.555	0.560	mg/L	1	0.500	0.099	91	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4943

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Manganese	0.466	0.471	mg/L	1	0.250	0.242	90	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4953

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Arsenic	0.550	<0.00593	mg/L	1	0.500	<0.00593	110		75 - 125	20

continued . . .

matrix spikes continued ...

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Arsenic	0.550	0.560	mg/L	1	0.500	<0.00593	110	2	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4953

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Barium	1.01	<0.000343	mg/L	1	1.00	0.084	93		75 - 125	20
Total Barium	1.01	1.02	mg/L	1	1.00	0.084	93	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4953

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Iron	0.483	<0.00220	mg/L	1	0.500	0.003	96		75 - 125	20
Total Iron	0.483	0.489	mg/L	1	0.500	0.003	96	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spike (MS-1) QC Batch: 4953

Param	MS Result	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	RPD	Rec. Limit	RPD Limit
Total Manganese	0.378	0.381	mg/L	1	0.250	0.142	94	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Standard (ICV-1) QC Batch: 4547

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	12.0	96	90 - 110	2003-09-23

Standard (CCV-1) QC Batch: 4547

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.9	95	90 - 110	2003-09-23

Standard (ICV-1) QC Batch: 4548

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.9	95	90 - 110	2003-09-23

Standard (CCV-1) QC Batch: 4548

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	11.8	94	90 - 110	2003-09-23

Standard (ICV-1) QC Batch: 4561

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1009	101	90 - 110	2003-09-23

Standard (CCV-1) QC Batch: 4561

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1005	100	90 - 110	2003-09-23

Standard (ICV-1) QC Batch: 4562

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1005	100	90 - 110	2003-09-23

Standard (CCV-1) QC Batch: 4562

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1029	103	90 - 110	2003-09-23

Standard (ICV-1) QC Batch: 4598

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1001	100	90 - 110	2003-09-25

Standard (CCV-1) QC Batch: 4598

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1021	102	90 - 110	2003-09-25

Standard (CCV-1) QC Batch: 4608

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0984	98	85 - 115	2003-09-23
Toluene		mg/L	0.100	0.0982	98	85 - 115	2003-09-23
Ethylbenzene		mg/L	0.100	0.0973	97	85 - 115	2003-09-23
Xylene (isomers)		mg/L	0.300	0.288	96	85 - 115	2003-09-23

Standard (CCV-2) QC Batch: 4608

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.100	100	85 - 115	2003-09-23
Toluene		mg/L	0.100	0.0999	100	85 - 115	2003-09-23
Ethylbenzene		mg/L	0.100	0.0989	99	85 - 115	2003-09-23
Xylene (isomers)		mg/L	0.300	0.294	98	85 - 115	2003-09-23

Standard (CCV-1) QC Batch: 4645

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.100	100	85 - 115	2003-09-23
Toluene		mg/L	0.100	0.0992	99	85 - 115	2003-09-23
Ethylbenzene		mg/L	0.100	0.0977	98	85 - 115	2003-09-23
Xylene (isomers)		mg/L	0.300	0.289	96	85 - 115	2003-09-23

Standard (CCV-2) QC Batch: 4645

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0978	98	85 - 115	2003-09-23
Toluene		mg/L	0.100	0.0968	97	85 - 115	2003-09-23
Ethylbenzene		mg/L	0.100	0.0982	98	85 - 115	2003-09-23
Xylene (isomers)		mg/L	0.300	0.281	94	85 - 115	2003-09-23

Standard (ICV-1) QC Batch: 4672

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0933	93	85 - 115	2003-09-25

continued . . .

standard continued ...

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Toluene		mg/L	0.100	0.0931	93	85 - 115	2003-09-25
Ethylbenzene		mg/L	0.100	0.0961	96	85 - 115	2003-09-25
Xylene (isomers)		mg/L	0.300	0.302	101	85 - 115	2003-09-25

Standard (CCV-1) QC Batch: 4672

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.0921	92	85 - 115	2003-09-25
Toluene		mg/L	0.100	0.0917	92	85 - 115	2003-09-25
Ethylbenzene		mg/L	0.100	0.0940	94	85 - 115	2003-09-25
Xylene (isomers)		mg/L	0.300	0.294	98	85 - 115	2003-09-25

Standard (CCV-1) QC Batch: 4699

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.104	104	85 - 115	2003-09-26
Toluene		mg/L	0.100	0.104	104	85 - 115	2003-09-26
Ethylbenzene		mg/L	0.100	0.104	104	85 - 115	2003-09-26
Xylene (isomers)		mg/L	0.300	0.306	102	85 - 115	2003-09-26

Standard (CCV-2) QC Batch: 4699

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.103	103	85 - 115	2003-09-26
Toluene		mg/L	0.100	0.103	103	85 - 115	2003-09-26
Ethylbenzene		mg/L	0.100	0.101	101	85 - 115	2003-09-26
Xylene (isomers)		mg/L	0.300	0.300	100	85 - 115	2003-09-26

Standard (ICV-1) QC Batch: 4700

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.106	106	85 - 115	2003-09-26
Toluene		mg/L	0.100	0.107	107	85 - 115	2003-09-26
Ethylbenzene		mg/L	0.100	0.107	107	85 - 115	2003-09-26
Xylene (isomers)		mg/L	0.300	0.316	105	85 - 115	2003-09-26

Standard (CCV-1) QC Batch: 4700

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.100	0.103	103	85 - 115	2003-09-26
Toluene		mg/L	0.100	0.102	102	85 - 115	2003-09-26
Ethylbenzene		mg/L	0.100	0.102	102	85 - 115	2003-09-26
Xylene (isomers)		mg/L	0.300	0.300	100	85 - 115	2003-09-26

Standard (ICV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Arsenic		mg/L	1.00	1.00	100	90 - 110	2003-10-08

Standard (ICV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Barium		mg/L	1.00	0.999	100	90 - 110	2003-10-08

Standard (ICV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1.00	1.00	100	90 - 110	2003-10-08

Standard (ICV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Manganese		mg/L	1.00	1.00	100	90 - 110	2003-10-08

Standard (CCV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Arsenic		mg/L	1.00	1.09	109	90 - 110	2003-10-08

Standard (CCV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Barium		mg/L	1.00	0.923	92	90 - 110	2003-10-08

Standard (CCV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1.00	0.984	98	90 - 110	2003-10-08

Standard (CCV-1) QC Batch: 4943

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Manganese		mg/L	1.00	0.963	96	90 - 110	2003-10-08

Standard (ICV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Arsenic		mg/L	1.00	1.00	100	90 - 110	2003-10-09

Standard (ICV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Barium		mg/L	1.00	0.999	100	90 - 110	2003-10-09

Standard (ICV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1.00	1.00	100	90 - 110	2003-10-09

Standard (ICV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Manganese		mg/L	1.00	1.00	100	90 - 110	2003-10-09

Standard (CCV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Arsenic		mg/L	1.00	1.06	106	90 - 110	2003-10-09

Standard (CCV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Barium		mg/L	1.00	0.915	92	90 - 110	2003-10-09

Standard (CCV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1.00	0.980	98	90 - 110	2003-10-09

Standard (CCV-1) QC Batch: 4953

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Manganese		mg/L	1.00	0.965	96	90 - 110	2003-10-09

Work Order: 3092105
Duke energy Field Services

Report Date: October 9, 2003
Linam Ranch Plant

3092105

V-102-0903-1

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

Chain of Custody

Date 9-18-03 Page 1 of 2

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES): Gil Van Deventer, Dale T. Littlejohn

Analysis Request

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Be,Cr,Fe, & Mn	Ions: SO4, Cl, & TDS	Ions: NO3					Number of Containers
MW-1	17774	Water	9-17-03	1516	G	✓													✓	✓						4
MW-2	75	Water	9-17-03	1100	G	✓													✓	✓						4
MW-3	76	Water	9-17-03	1130	G	✓													✓	✓						4
MW-4	77	Water	9-17-03	1015	G	✓													✓	✓						4
MW-5	78	Water	9-17-03	1020	G	✓													✓	✓						4
MW-7	79	Water	9-17-03	0825	G	✓													✓	✓						4
MW-8	80	Water	9-17-03	1440	G	✓													✓	✓						4
MW-9	81	Water	9-18-03	0930	G	✓													✓	✓						4
MW-10	82	Water	9-17-03	0810	G	✓													✓	✓						4
MW-10 d	83	Water	9-17-03	0930	G	✓													✓	✓						4

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: ~~Steve Weathers, PO Box 5493, Denver, CO 80217~~
Richard Baker - EC12ZB 704-~~845~~ 373-7889
P.O. Box 1006
Char. NC 28201

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental	TRACE ANALYSIS	
(Printed Name) Dale T. Littlejohn	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) Dale T. Littlejohn	(Signature) Helen Shelton	(Signature)
(Date) 9/19/03 (Time) 0430	(Date) 9/19/03 (Time) 1730	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TRACE ANALYSIS	Trace Analysis	
(Printed Name) HELEN SHELTON	(Printed Name) Michael Abel	(Printed Name)
(Signature) Helen Shelton	(Signature) Michael Abel	(Signature)
(Date) 9/19/03 (Time) 0930	(Date) 9/20/03 (Time) 11:00	(Date) (Time)

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MT 0° GLI 166130 4667

Work Order: 3092105
Duke energy Field Services

Report Date: October 9, 2003
Linam Ranch Plant

3092105

V-102-0903-2

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box [illegible]
Midland, Texas 79708
(915) 682-0608
(915) 682-0727 (Fax)

Chain of Custody

Date 9-18-03 Page 2 of 2

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES): [illegible] Dale T. Littlejohn

Analysis Request

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag, As, Ba, Cd, Cr, Fe, & Mn	Ions: Na, Cl, & TDS	Ions: NO_3					Number of Containers
MW-11	17 784	Water	9-17-03	1800	G	✓													✓	✓						4
MW-12	85	Water	9-17-03	1610	G	✓													✓	✓						4
MW-13	86	Water	9-17-03	1640	G	✓													✓	✓						4
Duplicate	87	Water	9-17-03	0000	G	✓																				~~2~~
Rinsate	88	Water	9-17-03	1810	G	✓																				2
Trip Blank	4132 ~~89~~	Water	4-18-03		G	✓																				2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: ~~Steve Weathers, PO Box 5493, Denver, CO 80217~~
Richard Baker

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental	TRACE ANALYSIS	
(Printed Name) Dale T. Littlejohn	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) [illegible]	(Signature) Helen Shelton	(Signature)
(Date) 9/19/03 (Time) 0930	(Date) 9/19/03 (Time) 1730	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TRACE ANALYSIS	Trace Analysis	
(Printed Name) HELEN SHELTON	(Printed Name) Michael Abel	(Printed Name)
(Signature) Helen Shelton	(Signature) Michael Abel	(Signature)
(Date) 9/19/03 (Time) 0930	(Date) 9/20/03 (Time) 11:00	(Date) (Time)

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MA 0° GI 1661304667

18-11-5

3092105

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0903-1

Chain of Custody

Date 9-18-03 Page 1 of 2

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES)

Sample Identification		Matrix	Date	Time	Sample Type: G - Grab, C - Composite	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	TCLP Metals	Total Metals: Ag, Al, As, Ba, Cd, Cr, Fe, & Mn	Ions: Na, Cl, & TDS	Ions: NO_3,					Number of Containers
MW-1	17774	Water	9-17-03	1516	G	✓													✓	✓						4
MW-2	75	Water	9-17-03	1100	G	✓													✓	✓						4
MW-3	76	Water	9-17-03	1130	G	✓													✓	✓						4
MW-4	77	Water	9-17-03	1015	G	✓													✓	✓						4
MW-5	78	Water	9-18-03	1020	G	✓													✓	✓						4
MW-7	79	Water	9-17-03	0825	G	✓													✓	✓						4
MW-8	80	Water	9-17-03	1440	G	✓													✓	✓						4
MW-9	81	Water	9-18-03	0930	G	✓													✓	✓						4
MW-10	82	Water	9-18-03	0810	G	✓													✓	✓						4
MW-10d	83	Water	9-18-03	0930	G	✓													✓	✓						4

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructures/Comments: Please send invoice direct to client:

Duke Energy Field Svcs, Attn: ~~Steve Weathers, PO Box 5493, Denver, CO 80217~~
Richard Baker · EC12ZB 704-~~845~~
P.O. Box 1006 · 373-7889
Chl. 28201

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental	TRACE ANALYSIS	
(Printed Name) Duke T. Littlejohn	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) Duke T. Littlejohn	(Signature) Helen Shelton	(Signature)
(Date) 9/19/03 (Time) 0930	(Date) 9/19/03 (Time) 1730	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TRACE ANALYSIS	Trace Analysis	
(Printed Name) HELEN SHELTON	(Printed Name) Michael Abel	(Printed Name)
(Signature) Helen Shelton	(Signature) Michael Abel	(Signature)
(Date) 9/19/03 (Time) 1930	(Date) 9/20/03 (Time) 11:00	(Date) (Time)

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MA 0° 11/16/03 30 4667

3092105

TRIDENT ENVIRONMENTAL

Trident
P.O. Box
Midland, Texas 79708
(915) 682-6008
(915) 682-0727 (Fax)
432

V-102-0903-2

Chain of Custody

Date 9-18-03 Page 2 of 2

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES): Gil Van Deventer, Dale T. Littlejohn

Analysis Request

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C - Composite	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	TCLP Metals	Total Metals: As, Ba, Fe, & Mn	Ions: Cl, & TDS	Ions: NO_3					Number of Containers
MW-11 17784	Water	9-17-03	1800	G	✓													✓	✓						4
MW-12 85	Water	9-17-03	1610	G	✓													✓	✓						4
MW-13 86	Water	9-17-03	1640	G	✓													✓	✓						4
Duplicate 87	Water	9-17-03	0000	G	✓																				~~2~~
Rinsate 88	Water	9-17-03	1810	G	✓																				2
Trip Blank (4132) 89	Water	4-18-03		G	✓																				2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: ~~Steve Weathers, PO Box 5493, Denver, CO 80217~~
Richard Baker

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental	TRACE ANALYSIS	
(Printed Name) Dale T. Littlejohn	(Printed Name) HELEN SHELTON	(Printed Name)
(Signature) Dale T. Littlejohn	(Signature) Helen Shelton	(Signature)
(Date) 9/19/03 (Time) 0930	(Date) 9/19/03 (Time) 1730	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TRACE ANALYSIS	Trace Analysis	
(Printed Name) HELEN SHELTON	(Printed Name) Michael Abel	(Printed Name)
(Signature) Helen Shelton	(Signature) Michael Abel	(Signature)
(Date) 9/19/03 (Time) 0930	(Date) 9/20/03 (Time) 11:00	(Date) (Time)

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MA 0° GI 1661304667

18-HS

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
TRIDENT ENVIRONMENTAL
ATTN: GIL VAN DEVENTER
P.O. BOX 7624
MIDLAND, TX 79708
FAX TO: (432) 682-0727

Receiving Date: 09/17/03
Reporting Date: 09/22/03
Project Number: V-102
Project Name: DUKE ENERGY FIELD SERVICES
Project Location: LINAM RANCH GAS PLANT

Sampling Date: 09/17/03
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: AH

LAB NUMBER	SAMPLE ID	SO_4 (mg/L)	NO_3 (mg/L)
ANALYSIS DATE:		09/18/03	09/18/03
H8012-1	MW 1	210	1.01
H8012-2	MW 2	32.8	2.00
H8012-3	MW 3	25.7	2.41
H8012-4	MW 4	10.8	3.23
H8012-5	MW 7	46.6	4.04
H8012-6	MW 8	102	5.60
H8012-7	MW 11	49.9	2.53
H8012-8	MW 12	92.5	3.37
H8012-9	MW 13	67.2	2.01
Quality Control		53.65	2.98
True Value QC		50.00	3.00
% Recovery		107	99.2
Relative Percent Difference		1.5	2.0

METHODS: EPA 600/4-79-020	375.4	353.3

Amy Hill
Chemist

9/22/03
Date

h8012

CARDINAL LABORATORIES

PHONE (325) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

ANALYTICAL RESULTS FOR
TRIDENT ENVIRONMENTAL
ATTN: GIL VAN DEVENTER
P.O. BOX 7624
MIDLAND, TX 79708
FAX TO: (432) 682-0727

Receiving Date: 09/18/03
Reporting Date: 09/22/03
Project Number: V-102
Project Name: DUKE ENERGY FIELD SERVICES
Project Location: LINAM RANCH GAS PLANT

Sampling Date: 09/18/03
Sample Type: WATER
Sample Condition: COOL & INTACT
Sample Received By: GP
Analyzed By: AH

LAB NUMBER	SAMPLE ID	SO_4 (mg/L)	NO_3 (mg/L)
ANALYSIS DATE:		09/19/03	09/19/03
H8012-10	MW 10	64.8	<0.1
H8012-11	MW 10D	117	0.38
H8012-12	MW 9	57.0	0.42
H8012-13	MW 5	101	0.49
Quality Control		53.65	2.98
True Value QC		50.00	3.00
% Recovery		107	99.2
Relative Percent Difference		1.5	2.0
METHODS: EPA 600/4-79-020		375.4	353.3

Amy Hill
Chemist

9/22/03
Date

h8012B

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page____ of____

Company Name: TRIDENT ENVIRONMENTAL	
Project Manager: GIL VAN DEVENTER	BILL TO PO #:
Address: PO Box 7624	Company: DEFS
City: MIDLAND State: TX Zip: 79708	Attn: RICHARD BAKER
Phone #: 432-682-0808	Address:
Fax #: 432-682-0727	City:
Project #: Project Owner: DEFS	State: Zip:
Project Name: DUKE ENERGY FIELD SERVICES	Phone #:
Project Location: LINAM RANCH GAS PLANT - HOBBS NM	Fax #:

FOR LAB USE ONLY LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRES.: ACID:	ICE / COOL	OTHER:	SAMPLING DATE	TIME	ANALYSIS REQUEST: NO3	SO4
H8012-1	MW-1		1	✓							✓		9/17/03	1516	✓	✓
-2	MW-2		1	✓							✓		✓	1100	✓	✓
-3	MW-3		1	✓							✓		✓	1130	✓	✓
-4	MW-4		1	✓							✓		✓	1015	✓	✓
-5	MW-7		1	✓							✓		✓	0825	✓	✓
-6	MW-8		1	✓							✓		✓	1440	✓	✓
-7	MW-11		1	✓							✓		✓	1806	✓	✓
-8	MW-12		1	✓							✓		✓	1610	✓	✓
-9	MW-13		1	✓							✓		✓	1640	✓	✓

Sampler Relinquished:	Date: / Time:	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #:
			Fax Result: ☐ Yes ☐ No
Relinquished By:	Date: 9/17/2003 Time: 6:00 pm	Received By: (Lab Staff)	REMARKS:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool: ☒ Yes ☐ No Intact: ☒ Yes ☐ No	CHECKED BY: (Initials)

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page____ of____

Company Name: TRIDENT ENVIRONMENTAL	
Project Manager: GIL VAN DEVENTER	BILL TO — PO #:
Address: P.O. BOX 7624	Company: DEFS
City: MIDLAND State: TX Zip: 79708	Attn:
Phone #: ~~32~~ 432-682-0808	Address:
Fax #: 432-682-0727	City:
Project #: Project Owner: DEFS	State: Zip:
Project Name: DUKE ENERGY FIELD SERVICES	Phone #:
Project Location: LINAM RANCH GAS PLANT	Fax #:

ANALYSIS REQUEST

FOR LAB USE ONLY LAB I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRES.: ACID:	ICE / COOL	OTHER:	SAMPLING DATE	TIME	NO3	SO4
H8012-10	MW-10		1	✓							✓		09/18/02	0810	✓	✓
-11	MW-10d		1	✓							✓			0920	✓	✓
-12	MW-9		1	✓							✓			0930	✓	✓
-13	MW-5		1	✓							✓			1020	✓	✓

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Terms and Conditions: Interest will be charged on all accounts more than 30 days past due at the rate of 24% per annum from the original date of invoice, and all costs of collections, including attorney's fees.

Sampler Relinquished: Dale T Littlepage	Date: Time:	Received By:	Phone Result ☐ Yes ☐ No Additional Fax #: Fax Result: ☐ Yes ☐ No REMARKS:
Relinquished By:	Date: 09/18/2003 Time: 6:15 PM	Received By: (Lab Staff)	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool ☒ Yes ☐ No Intact ☒ Yes ☐ No	CHECKED BY: (Initials)

† Cardinal cannot accept verbal changes. Please fax written changes to 915-673-7020.

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0903-2

Chain of Custody

Date 9/18/03 Page 1 of 1

Lab Name: Cardinal Laboratories
Address: 101 East Marland Blvd.
Hobbs, NM 88240
Telephone: 505-393-2326

Samplers (SIGNATURES)

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	Ions: SO_4, Cl, & TDS	Ions: NO_3, SO_4					Number of Containers
MW-10	Water	9/18/03	0810	G																✓					1
MW-10d	"	"	0920	G																✓					1
MW-9	"	"	0930	G																✓					1
MW-5	"	"	1020	G																✓					1

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Gas Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: ~~Steve Weathers, PO Box 5493, Denver, CO 80217~~
Richard Baker

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Dale T Littlejohn	(Printed Name)	(Printed Name)
(Signature) Dale T Littlejohn	(Signature)	(Signature)
(Date) (Time)	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
		Cardinal Labs
(Printed Name)	(Printed Name)	(Printed Name) Gayle Potter
(Signature)	(Signature)	(Signature)
(Date) (Time)	(Date) (Time)	(Date) 09/18/2003 (Time) 6:15 PM

Copy signed original form for Trident Environmental records

APPENDIX B

Monitoring Well Sampling Data Forms

APPENDIX B

MONITORING WELL

SAMPLING DATA SHEETS

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.15 Feet
DEPTH TO WATER: 46.38 Feet
HEIGHT OF WATER COLUMN: 6.77 Feet
WELL DIAMETER: 2.0 Inch

3.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
14:58	0	-	-	-	-	-	Pump On
15:01	2	73.2	2.35	6.85	0.62		
15:05	4	70.6	2.20	6.89	0.51		
15:09	6	70.1	2.14	6.90	0.41		
15:12	8	69.9	2.12	6.93	0.44		
15:15	10	71.0	2.11	7.02	0.62		
						0.14	mg/L Ferrous Iron (Fe^{-2})
						15:16	Time of sample collection
0:17	:Total Time (hr:min)		**10**	:Total Vol (gal)		**0.59**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 50.31 Feet
DEPTH TO WATER: 45.55 Feet
HEIGHT OF WATER COLUMN: 4.76 Feet
WELL DIAMETER: 2.0 Inch

2.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-		Hand bailed
11:00	3	72.7	0.74	7.38	3.76		
						0.08	mg/L Ferrous Iron (Fe^{-2})
						11:00	Time of sample collection
:Total Time (hr:min)			**3** :Total Vol (gal)			:Flow Rate (gal/min)	

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.12 Feet
DEPTH TO WATER: 48.83 Feet
HEIGHT OF WATER COLUMN: 6.29 Feet
WELL DIAMETER: 2.0 Inch

3.1 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
11:13	0	-	-	-	-		
11:17	2	72.40	0.44	7.73	-		Well kept pumping off after pumping ~1-2
11:25	4	70.90	0.44	7.73	-		minutes
11:29	6	69.90	0.46	7.77	7.50		
						0.12	mg/L Ferrous Iron (Fe^{-2})
						11:30	Time of sample collection
0:16	:Total Time (hr:min)		**6**	:Total Vol (gal)		**0.38**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-4**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/17/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 48.29 Feet
HEIGHT OF WATER COLUMN: 7.71 Feet
WELL DIAMETER: 2.0 Inch

3.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	Hand bailed
10:15	15	70.3	3.70	6.89	1.16	-	
						5.92	mg/L Ferrous Iron (Fe^{-2})
						10:15	Time of sample collection
0:00	:Total Time (hr:min)		**15**	:Total Vol (gal)			:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-5**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/18/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.16 Feet
DEPTH TO WATER: 49.28 Feet
HEIGHT OF WATER COLUMN: 5.88 Feet
WELL DIAMETER: 4.0 Inch

11.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
10:06	0	-	-	-	-	-	Pump On
10:08	5	73.0	2.13	6.88	0.87		
10:10	10	72.8	2.15	6.93	0.66		
10:12	15	72.5	2.19	6.94	0.65		
10:15	20	72.2	2.23	6.98	1.00		
10:17	25	72.4	2.22	7.00	0.87		Pump Off
						4.50	mg/L Ferrous Iron (Fe^{-2})
						10:20	Time of sample collection
0:11	:Total Time (hr:min)		**25**	:Total Vol (gal)		**2.27**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-7**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/17/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.40 Feet
DEPTH TO WATER: 59.35 Feet
HEIGHT OF WATER COLUMN: 3.05 Feet
WELL DIAMETER: 2.0 Inch

1.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
8:15	0	-	-	-	2.60	-	Hand bailed
8:25	1.5	66.0	1.1	7.6	6.93	-	Bailed dry
						0.30	mg/L Ferrous Iron (Fe^{-2})
						8:25	Time of sample collection
0:10	:Total Time (hr:min)		**1.5**	:Total Vol (gal)		**0.15**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.11 Feet
DEPTH TO WATER: 45.47 Feet
HEIGHT OF WATER COLUMN: 12.64 Feet
WELL DIAMETER: 4.0 Inch

24.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
14:20	0	-	-	-			Pump On
14:25	5	86.00	1.98	7.04	7.75		
14:28	10	79.30	1.14	7.10	3.24		
14:31	15	73.30	1.19	7.08	2.85		
14:35	20	71.90	1.14	7.11	3.05		
14:37	25	71.40	1.17	7.11	2.96		Pump Off
						0.00	mg/L Ferrous Iron (Fe^{-2})
						14:40	Time of sample collection
0:17	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.47**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/18/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.90 Feet
DEPTH TO WATER: 52.00 Feet
HEIGHT OF WATER COLUMN: 6.90 Feet
WELL DIAMETER: 2.0 Inch

3.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
9:20	0	-	-	-	-	-	Hand bailed
9:30	5	67.8	1.1	7.1	1.89	-	
						0.05	mg/L Ferrous Iron (Fe^{-2})
						9:30	Time of sample collection
0:10	:Total Time (hr:min)		**5**	:Total Vol (gal)		**0.50**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/18/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.97 Feet
DEPTH TO WATER: 52.03 Feet
HEIGHT OF WATER COLUMN: 12.94 Feet
WELL DIAMETER: 4.0 Inch

25.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
7:56	0	-	-	-	-	-	Pump On
7:58	5	69.0	1.72	7.15	1.60		
8:00	10	69.4	1.70	7.14	0.83		
8:02	15	69.3	1.71	7.18	0.62		
8:05	20	69.5	1.71	7.22	0.56		
8:07	25	69.5	1.71	7.21	0.28		
						0.92	mg/L Ferrous Iron (Fe^{-2})
						8:10	Time of sample collection
0:11	:Total Time (hr:min)		**25**	:Total Vol (gal)		**2.27**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-10D**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/18/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 78.44 Feet
DEPTH TO WATER: 53.08 Feet
HEIGHT OF WATER COLUMN: 25.36 Feet
WELL DIAMETER: 2.0 Inch

12.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
9:20	12	67.3	1.62	7.08	1.15	-	Hand bailed
						9:20	Time of sample collection
0:00	:Total Time (hr:min)		**12**	:Total Vol (gal)			:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.69 Feet
DEPTH TO WATER: 53.04 Feet
HEIGHT OF WATER COLUMN: 9.65 Feet
WELL DIAMETER: 4.0 Inch

18.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
17:23	0	-	-	-	-	-	Pump On
17:26	5	74.3	1.39	6.92	0.52		
17:29	10	73.2	1.40	6.88	0.20		
17:32	15	72.6	1.41	6.87	0.25		
17:35	20	72.4	1.41	6.91	0.51		
17:38	25	72.7	1.41	7.14	0.63		
						0.04	mg/L Ferrous Iron (Fe^{-2})
						18:00	Time of sample collection
							Collected duplicate sample for
							BTEX analysis
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-12**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/17/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 59.14 Feet
DEPTH TO WATER: 52.03 Feet
HEIGHT OF WATER COLUMN: 7.11 Feet
WELL DIAMETER: 4.0 Inch

13.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
15:54	0	-	-	-	-	-	Pump On
15:56	5	74.0	1.36	7.87	2.27		
15:58	10	72.1	1.48	7.34	1.22		
16:02	15	71.5	1.51	8.37	1.15		
16:05	20	71.7	1.53	8.40	0.79		
16:07	25	71.1	1.55	8.68	0.79		
						0.01	mg/L Ferrous Iron (Fe^{-2})
						16:10	Time of sample collection
0:13	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.92**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.87 Feet
DEPTH TO WATER: 53.67 Feet
HEIGHT OF WATER COLUMN: 9.20 Feet
WELL DIAMETER: 4.0 Inch

18.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
16:26	0	-	-	-	-		Pump On
16:28	5	73.2	1.68	7.15	0.79		
16:31	10	72.2	1.82	7.04	0.53		
16:34	15	71.7	1.88	7.03	0.42		
16:37	20	72.4	1.87	7.17	-		
16:40	25	73.6	1.87	7.00	0.98		
						1.12	mg/L Ferrous Iron (Fe^{-2})
						16:40	Time of sample collection
0:14	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.78**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

2003 Annual Groundwater Monitoring Report
Duke Energy Field Services
Linam Ranch Gas Plant
Lea County, New Mexico

Prepared by:

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SBMITTED BY:

Gilbert J. Van Deventer, REM
Project Manager

DATE: 02-16-04

REVIEWED BY:

Dale T. Littlejohn
Quality Assurance/Control Officer

DATE: 02-18-04

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/10/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.15 Feet
DEPTH TO WATER: 45.86 Feet
HEIGHT OF WATER COLUMN: 7.29 Feet
WELL DIAMETER: 2.0 Inch

3.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
9:48	0	-	-	-	-	-	Pump On
9:54	3	19.8	2100	6.81	2.91	5	
9:54	6	20.7	1852	6.88	2.18	10	
10:04	9	20.8	1821	6.92	1.81	20	
10:10	12	20.9	1784	6.92	1.76	25	
10:15	15	21.0	1750	6.91	1.70	30	
						0.10	mg/L Ferrous Iron (Fe^{-2})
						10:20	Time of sample collection
0:27	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.56**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO_3, SO_4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/10/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" SuperPurger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 50.31 Feet
DEPTH TO WATER: 45.03 Feet
HEIGHT OF WATER COLUMN: 5.28 Feet
WELL DIAMETER: 2.0 Inch

2.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
10:37	0	-	-	-	-		
10:41	1	20.7	741	7.24	3.02	25	
10:45	1.5	21.0	658	7.46	4.17	630	
10:53	2	21.7	662	7.37	3.31	1050	
10:57	2.5	21.6	670	7.43	3.60	220	
11:03	3	21.9	673	7.36	3.21	Above Range	
						0.03	mg/L Ferrous Iron (Fe^{-2})
						11:00	Time of sample collection
:Total Time (hr:min)			**3** :Total Vol (gal)			:Flow Rate (gal/min)	

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/10/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.12 Feet
DEPTH TO WATER: 48.64 Feet
HEIGHT OF WATER COLUMN: 6.48 Feet
WELL DIAMETER: 2.0 Inch

3.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
8:50	0	-	-	-	-		
8:55	3	20.6	410	7.61	6.00	55	
9:00	6	20.6	638	7.71	6.25	45	
9:06	9	20.7	492	7.74	6.18	40	
9:12	12	20.6	490	7.64	6.25	35	
9:18	15	20.8	488	7.64	6.40	35	
						0.00	mg/L Ferrous Iron (Fe^{-2})
						11:30	Time of sample collection
0:28	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.54**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-4**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 47.85 Feet
HEIGHT OF WATER COLUMN: 8.15 Feet
WELL DIAMETER: 2.0 Inch

4.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
10:45	0	-	-	-	-	-	Hand bailed
10:58	5	22.6	3470	6.92	1.87	Above Range	
11:30	10	22.3	2560	6.93	2.22	Above Range	
11:37	15	21.6	2560	6.88	2.64	Above Range	
11:42	20	21.2	2570	6.96	3.08	Above Range	
11:44	25	21.8	2570	6.92	2.91	Above Range	
						6.28	mg/L Ferrous Iron (Fe^{-2})
						11:45	Time of sample collection
0:59	:Total Time (hr:min)		**25**	:Total Vol (gal)		**0.42**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

C:/FORMS/SAMPLING DATA FORM

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.16 Feet
DEPTH TO WATER: 48.79 Feet
HEIGHT OF WATER COLUMN: 6.37 Feet
WELL DIAMETER: 4.0 Inch

12.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
10:26	0	-	-	-	-	-	Pump On
10:29	5	23.7	1766	7.32	3.54	10	
10:32	10	24.8	1968	7.21	3.23	-15	
10:35	15	25.1	1971	7.06	2.07	-80	
10:38	20	25.3	1990	7.00	1.68	Out of Range	
10:40	25	25.3	1787	7.00	1.56	Out of Range	Pump Off
						4.50	mg/L Ferrous Iron (Fe^{-2})
						10:20	Time of sample collection
0:14	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.79**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-6**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.30 Feet
DEPTH TO WATER: 48.96 Feet
HEIGHT OF WATER COLUMN: 4.34 Feet
WELL DIAMETER: 4.0 Inch

8.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
11:22	0	-	-	-	-	-	Hand bailed
11:28	5	27.2	2730	6.96	2.19	-80	
11:53	10	22.2	2130	7.05	1.52	-60	
						3.18	mg/L Ferrous Iron (Fe^{-2})
						12:20	Time of sample collection
0:31	:Total Time (hr:min)		**10**	:Total Vol (gal)		**0.32**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.40 Feet
DEPTH TO WATER: 57.41 Feet
HEIGHT OF WATER COLUMN: 4.99 Feet
WELL DIAMETER: 2.0 Inch

2.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
12:51	0	-	-	-	-	-	Hand bailed
12:58	1	27.0	902	7.1	4.75	90	Bailed dry
13:05	2	22.40	871	7.38	4.71	105	
13:11	2.5	22.30	857	7.39	4.94	110	
						0.12	mg/L Ferrous Iron (Fe^{-2})
						13:30	Time of sample collection
0:20	:Total Time (hr:min)		**2.5**	:Total Vol (gal)		**0.12**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/10/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.11 Feet
DEPTH TO WATER: 44.59 Feet
HEIGHT OF WATER COLUMN: 13.52 Feet
WELL DIAMETER: 4.0 Inch

26.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
13:24	0	-	-	-			Pump On
13:28	5	24.5	721	7.13	4.33	10	
13:32	10	22.7	603	7.58	6.23	Out of Range	
13:36	15	22.4	616	7.21	4.86	-60	
13:40	20	22.6	623	7.20	4.48	-40	
13:44	25	22.7	631	7.12	4.18	-25	Pump Off
						0.01	mg/L Ferrous Iron (Fe^{-2})
						14:00	Time of sample collection
0:20	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.25**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/10/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.90 Feet
DEPTH TO WATER: 51.80 Feet
HEIGHT OF WATER COLUMN: 7.10 Feet
WELL DIAMETER: 2.0 Inch

3.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
12:36	0	-	-	-	-	-	Pump on
12:42	3	22.7	913.0	7.0	1.79	90	
12:46	6	22.10	846	7.03	1.75	15	
12:54	9	21.80	867	7.01	1.30	45	
13:00	12	21.9	865	7.02	1.33	140	Pump off
						0.02	mg/L Ferrous Iron (Fe^{-2})
						13:00	Time of sample collection
0:24	:Total Time (hr:min)		**12**	:Total Vol (gal)		**0.50**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

C:/FORMS/SAMPLING DATA FORM

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/10/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.97 Feet
DEPTH TO WATER: 51.73 Feet
HEIGHT OF WATER COLUMN: 13.24 Feet
WELL DIAMETER: 4.0 Inch

25.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
16:25	0	-	-	-	-	-	Pump On
16:27	5	23.3	1187	7.24	4.11	Out of Range	
16:29	10	23.0	1244	7.39	6.34	Out of Range	
16:33	15	23.2	1282	7.29	3.85	Out of Range	
16:37	20	23.6	1308	7.32	3.94	Out of Range	
16:42	25	23.6	1293	7.49	5.65	Out of Range	Pump Off
						0.41	mg/L Ferrous Iron (Fe^{-2})
						16:46	Time of sample collection
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.67**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-10D**

SITE NAME: Linam Ranch Gas Plant

DATE: 3/10/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 78.44 Feet
DEPTH TO WATER: 52.69 Feet
HEIGHT OF WATER COLUMN: 25.75 Feet
WELL DIAMETER: 2.0 Inch

12.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
16:38	0	-	-	-	-	-	Hand bailed
16:42	4	23.0	1189	7.11	1.51	Out of Range	
16:46	6	22.0	1159	7.06	1.5	Out of Range	
16:55	9	21.9	1391	7.02	1.34	Out of Range	
17:02	12	21.5	1382	7.01	1.34	Out of Range	
17:08	15	21.8	1389	7.00	1.23	Out of Range	
						17:26	Time of sample collection
0:30	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.50**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-11**

SITE NAME: Linam Ranch Gas Plant

DATE: 3/10/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.69 Feet
DEPTH TO WATER: 52.53 Feet
HEIGHT OF WATER COLUMN: 10.16 Feet
WELL DIAMETER: 4.0 Inch

19.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
15:37	0	-	-	-	-	-	Pump On
15:41	5	24.3	1123	6.92	3.82	105	
15:43	10	23.6	1021	6.92	3.53	145	
15:47	15	23.4	1020	6.96	3.68	80	
15:51	20	23.9	1029	6.92	3.48	130	
15:56	25	24.2	1059	6.96	3.64	90	
						0.01	mg/L Ferrous Iron (Fe^{-2})
						16:08	Time of sample collection
							Collected duplicate sample for
							BTEX analysis
0:19	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.31**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-12**

SITE NAME: Linam Ranch Gas Plant

DATE: 3/10/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 59.14 Feet
DEPTH TO WATER: 51.69 Feet
HEIGHT OF WATER COLUMN: 7.45 Feet
WELL DIAMETER: 4.0 Inch

14.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
14:20	0	-	-	-	-	-	Pump On
14:24	5	24.3	985	6.83	3.61	195	
14:28	10	23.3	1073	6.96	3.73	180	
14:32	15	23.5	1095	6.87	2.70	185	
14:35	20	23.5	1096	6.96	3.72	110	
14:40	25	23.6	1105	6.94	3.00	130	
						0.14	mg/L Ferrous Iron (Fe^{-2})
						14:50	Time of sample collection
0:20	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.25**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-13**

SITE NAME: Linam Ranch Gas Plant

DATE: 3/10/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.87 Feet
DEPTH TO WATER: 53.42 Feet
HEIGHT OF WATER COLUMN: 9.45 Feet
WELL DIAMETER: 4.0 Inch

18.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. µS/cm	pH	DO mg/L	ORP mV	PHYSICAL APPEARANCE AND REMARKS
15:01	0	-	-	-	-		Pump On
15:05	5	24.1	1215	6.97	3.71	160	
15:07	10	23.1	1191	7.02	4.54	45	
15:09	15	22.6	1298	6.94	3.14	120	
15:11	20	22.6	1340	6.98	4.17	80	
15:13	25	22.6	1360	6.96	3.38	55	
						0.32	mg/L Ferrous Iron (Fe^{-2})
						15:30	Time of sample collection
0:12	:Total Time (hr:min)		**25**	:Total Vol (gal)		**2.08**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, NO3, SO4, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.15 Feet
DEPTH TO WATER: 46.38 Feet
HEIGHT OF WATER COLUMN: 6.77 Feet
WELL DIAMETER: 2.0 Inch

3.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
14:58	0	-	-	-	-	-	Pump On
15:01	2	73.2	2.35	6.85	0.62		
15:05	4	70.6	2.20	6.89	0.51		
15:09	6	70.1	2.14	6.90	0.41		
15:12	8	69.9	2.12	6.93	0.44		
15:15	10	71.0	2.11	7.02	0.62		
						0.14	mg/L Ferrous Iron (Fe^{-2})
						15:16	Time of sample collection
0:17	:Total Time (hr:min)		**10**	:Total Vol (gal)		**0.59**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 50.31 Feet
DEPTH TO WATER: 45.55 Feet
HEIGHT OF WATER COLUMN: 4.76 Feet
WELL DIAMETER: 2.0 Inch

2.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-		Hand bailed
11:00	3	72.7	0.74	7.38	3.76		
						0.08	mg/L Ferrous Iron (Fe^{-2})
						11:00	Time of sample collection
:Total Time (hr:min)			**3** :Total Vol (gal)			:Flow Rate (gal/min)	

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-4**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 48.29 Feet
HEIGHT OF WATER COLUMN: 7.71 Feet
WELL DIAMETER: 2.0 Inch

3.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
	0	-	-	-	-	-	Hand bailed
10:15	15	70.3	3.70	6.89	1.16	-	
						5.92	mg/L Ferrous Iron (Fe^{-2})
						10:15	Time of sample collection
0:00	:Total Time (hr:min)		**15**	:Total Vol (gal)			:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/18/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.16 Feet
DEPTH TO WATER: 49.28 Feet
HEIGHT OF WATER COLUMN: 5.88 Feet
WELL DIAMETER: 4.0 Inch

11.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
10:06	0	-	-	-	-	-	Pump On
10:08	5	73.0	2.13	6.88	0.87		
10:10	10	72.8	2.15	6.93	0.66		
10:12	15	72.5	2.19	6.94	0.65		
10:15	20	72.2	2.23	6.98	1.00		
10:17	25	72.4	2.22	7.00	0.87		Pump Off
						4.50	mg/L Ferrous Iron (Fe^{-2})
						10:20	Time of sample collection
0:11	:Total Time (hr:min)		**25**	:Total Vol (gal)		**2.27**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-7**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/17/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.40 Feet
DEPTH TO WATER: 59.35 Feet
HEIGHT OF WATER COLUMN: 3.05 Feet
WELL DIAMETER: 2.0 Inch

1.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
8:15	0	-	-	-	2.60	-	Hand bailed
8:25	1.5	66.0	1.1	7.6	6.93	-	Bailed dry
						0.30	mg/L Ferrous Iron (Fe^{-2})
						8:25	Time of sample collection
0:10	:Total Time (hr:min)		**1.5**	:Total Vol (gal)		**0.15**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-9**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/18/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.90 Feet
DEPTH TO WATER: 52.00 Feet
HEIGHT OF WATER COLUMN: 6.90 Feet
WELL DIAMETER: 2.0 Inch

3.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO ppm		PHYSICAL APPEARANCE AND REMARKS
9:20	0	-	-	-	-	-	Hand bailed
9:30	5	67.8	1.1	7.1	1.89	-	
						0.05	mg/L Ferrous Iron (Fe^{-2})
						9:30	Time of sample collection
0:10	:Total Time (hr:min)		**5**	:Total Vol (gal)		**0.50**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/18/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.97 Feet
DEPTH TO WATER: 52.03 Feet
HEIGHT OF WATER COLUMN: 12.94 Feet
WELL DIAMETER: 4.0 Inch

25.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
7:56	0	-	-	-	-	-	Pump On
7:58	5	69.0	1.72	7.15	1.60		
8:00	10	69.4	1.70	7.14	0.83		
8:02	15	69.3	1.71	7.18	0.62		
8:05	20	69.5	1.71	7.22	0.56		
8:07	25	69.5	1.71	7.21	0.28		
						0.92	mg/L Ferrous Iron (Fe^{-2})
						8:10	Time of sample collection
0:11	:Total Time (hr:min)		**25**	:Total Vol (gal)		**2.27**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-10D**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/18/2003

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 78.44 Feet
DEPTH TO WATER: 53.08 Feet
HEIGHT OF WATER COLUMN: 25.36 Feet
WELL DIAMETER: 2.0 Inch

12.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
9:20	12	67.3	1.62	7.08	1.15	-	Hand bailed
						9:20	Time of sample collection
0:00	:Total Time (hr:min)		**12**	:Total Vol (gal)			:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.69 Feet
DEPTH TO WATER: 53.04 Feet
HEIGHT OF WATER COLUMN: 9.65 Feet
WELL DIAMETER: 4.0 Inch

18.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
17:23	0	-	-	-	-	-	Pump On
17:26	5	74.3	1.39	6.92	0.52		
17:29	10	73.2	1.40	6.88	0.20		
17:32	15	72.6	1.41	6.87	0.25		
17:35	20	72.4	1.41	6.91	0.51		
17:38	25	72.7	1.41	7.14	0.63		
						0.04	mg/L Ferrous Iron (Fe^{-2})
						18:00	Time of sample collection
							Collected duplicate sample for
							BTEX analysis
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-12**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 59.14 Feet
DEPTH TO WATER: 52.03 Feet
HEIGHT OF WATER COLUMN: 7.11 Feet
WELL DIAMETER: 4.0 Inch

13.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
15:54	0	-	-	-	-	-	Pump On
15:56	5	74.0	1.36	7.87	2.27		
15:58	10	72.1	1.48	7.34	1.22		
16:02	15	71.5	1.51	8.37	1.15		
16:05	20	71.7	1.53	8.40	0.79		
16:07	25	71.1	1.55	8.68	0.79		
						0.01	mg/L Ferrous Iron (Fe^{-2})
						16:10	Time of sample collection
0:13	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.92**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/17/2003
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 3" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.87 Feet
DEPTH TO WATER: 53.67 Feet
HEIGHT OF WATER COLUMN: 9.20 Feet
WELL DIAMETER: 4.0 Inch

18.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °F	COND. mS/cm	pH	DO mg/L		PHYSICAL APPEARANCE AND REMARKS
16:26	0	-	-	-	-		Pump On
16:28	5	73.2	1.68	7.15	0.79		
16:31	10	72.2	1.82	7.04	0.53		
16:34	15	71.7	1.88	7.03	0.42		
16:37	20	72.4	1.87	7.17	-		
16:40	25	73.6	1.87	7.00	0.98		
						1.12	mg/L Ferrous Iron (Fe^{-2})
						16:40	Time of sample collection
0:14	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.78**	:Flow Rate (gal/min)

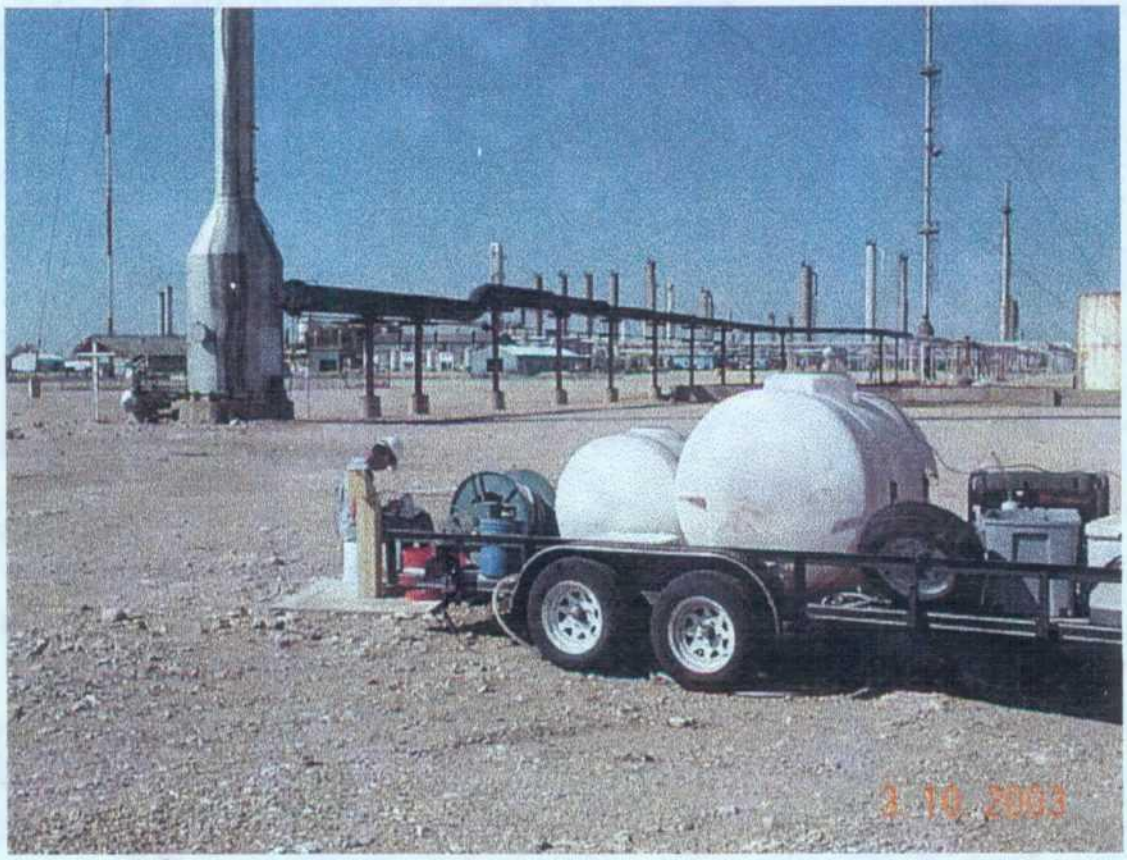
COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, As, Ba, Fe & Mn analysis.

2002 Annual Groundwater Sampling and Monitoring Report
Duke Energy Field Services
Linam Ranch Natural Gas Plant
Lea County, New Mexico

MAY 22, 2003

Prepared For:

Duke Energy Field Services
P. O. Box 5493
Denver, CO 80217



Prepared By:

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2002 Annual Groundwater Monitoring Report
Duke Energy Field Services
Linam Ranch Gas Plant
Lea County, New Mexico

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SBMITTED BY: DATE: 05-22-03

Gilbert J. Van Deventer, REM
Project Manager

REVIEWED BY: DATE: 05-22-03

Dale T. Littlejohn
Quality Assurance/Control Officer

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APPENDICES

1.0 Executive Summary

Trident Environmental (Trident) was retained by Duke Energy Field Services (DEFS) to perform the sampling and monitoring operations at the Linam Ranch Plant. This 2002 Annual Groundwater Monitoring Report documents the two semi-annual sampling events performed by Trident at the DEFS Linam Ranch Plant on March 11-12, 2002 and September 25-26, 2002. This report also contains the historical groundwater elevation and analytical data and includes data from all monitoring wells on site. The monitoring and sampling program was conducted in accordance with the revised monitoring plan specified by Mr. Bill Olson of the New Mexico Oil Conservation Division (OCD) in his letter dated March 19, 1999.

Based on the sampling and monitoring data to date, the following conclusions relevant to groundwater conditions at the Linam Ranch Plant are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-10D, MW-11, MW-12 and MW-13 were below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.

- Benzene levels in MW-4 (18.8 mg/L), MW-5 (0.381 mg/L), MW-6 (1.29 mg/L), MW-9 (0.071 mg/L) and MW-10 (3.48 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (former liquid waste disposal area) and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of December 12, 2002, the light non-aqueous phase liquids (LNAPL) recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 16.8 gallons of LNAPL (condensate) from monitoring wells MW-4 and MW-6. The measured thickness of LNAPL in MW-4 has remained at or below 0.01 feet since February 17, 2002, while the LNAPL thickness in MW-6 has been measured at or below 0.01 feet since October 24, 2002. The minimal LNAPL thickness in these two wells has allowed groundwater samples to be collected during 2002.

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2003.
- Discontinue analyses for aluminum, cadmium, chromium, and silver since these constituents have been below WQCC standards for over four years (over seven years in most cases).
- Continue LNAPL removal from MW-4 and MW-6 using absorbent socks or passive bailers with monthly inspections. Obtain groundwater samples from these two wells if the LNAPL thickness is less than 0.01 feet.

2.0 Chronology of Events

February 7, 1994	Geoscience Consultants Ltd (GCL) was retained by ENRON Operations Corporation (ENRON) to address groundwater quality conditions at the Hobbs Gas Plant, which was scheduled for acquisition by GPM. As part of a subsurface investigation for two areas within the plant, GCL completed temporary drive point wells DP-1 and DP-2 downgradient and upgradient, respectively, of the EOTT tanks, and one monitoring well, MW-8, downgradient of the former liquid waste disposal area. Hydrocarbon-impacted groundwater was identified in DP-1.
May 18-22, 1994	Daniel B. Stevens and Associates (DBS&A) completed seven temporary drive point wells (EOTT-1 through EOTT-7) to delineate the horizontal extent of hydrocarbon-impacted soils and groundwater in the EOTT tank area. Drive point well EOTT-6 was converted into monitoring well MW-9. Hydrocarbon-impacted groundwater was identified east of the EOTT tanks.
October 7, 1994	The OCD requested ENRON to provide a work plan to completely define the extent of groundwater contamination at the Hobbs Gas Plant.
November 1994	GPM acquired ownership and operation of the Linam Ranch Plant (formerly Hobbs Gas Plant) from ENRON.
February 23, 1995	GPM submitted a subsurface investigation work plan to the OCD to address the groundwater conditions at Linam Ranch Plant.
April 5, 1995	The OCD approved the subsurface investigation work plan.
May 10-13, 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 five monitoring wells (MW-10D, MW-10, MW-11, MW-12, and MW-13) and two soils borings (SB-1 and SB-2).
September 18, 1995	GPM submitted the *Subsurface Investigation and Preliminary Remedial Response* report for the Linam Ranch Plant to the OCD.
October 19, 1995	The OCD approved GPM's recommendations for remedial action, which included a quarterly sampling and monitoring program.
November 14, 1995	GCL conducted the fourth quarter 1995 sampling event at Linam Ranch Plant.
January 17, 1996	GCL conducted the first quarter 1996 sampling event at Linam Ranch Plant.
April 24, 1996	GCL conducted the annual (second quarter 1996) sampling event at Linam Ranch Plant. The annual report included recommendations to the OCD for continued monitoring on a semi-annual basis.

January 22, 1997	BDM International, Inc. (formerly GCL) conducted the semi-annual (first quarter 1997) sampling event.
February 5, 1997	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
August 15, 1997	BDM International, Inc. (BDM) conducted the third quarter 1997 (annual) sampling event.
December 11, 1997	GPM submitted the 1997 Annual Groundwater Monitoring and Sampling Report to the OCD.
January 22, 1998	BDM, a wholly owned subsidiary of TRW, conducted the semi-annual (first quarter 1998) sampling event.
March 25, 1998	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
July 22, 1998	TRW conducted the third quarter 1998 (annual) sampling event.
December 4, 1998	GPM submitted the 1998 Annual Groundwater Monitoring and Sampling Report to the OCD.
February 9, 1999	TRW conducted the semi-annual (first quarter 1999) sampling event.
February 10, 1999	GPM submitted a request to revise the monitoring plan to the OCD. The request proposed additional downgradient monitoring in the area of the EOTT tanks (MW-3) in lieu of installing additional wells. The request also proposed expanding the monitoring program to include semi-annual sampling of monitoring wells in the vicinity of the former liquid waste disposal area.
March 19, 1999	The OCD approved GPM's proposed request to revise the monitoring plan.
August 24-25, 1999	TRW conducted the annual (third quarter 1999) sampling event.
October 26, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.
November 22, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.
December 20, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.
January 26, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.

February 22-23, 2000	TRW conducted the semi-annual (first quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and the absorbent sock in MW-6 was removed.
April 4, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and gauge the product thickness in MW-4 and MW-6.
April 24, 2000	TRW conducted a site visit to empty the passive bailer in MW-4, gauge the product thickness in MW-4 and MW-6, and install a new absorbent sock in MW-6.
June 15, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, and replace the absorbent sock in MW-6.
July 12, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, and check the absorbent sock in MW-6. Product from the sock in MW-6 was squeezed out and returned to the well.
August 17-18, 2000	TRW conducted the annual (third quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and replaced with an absorbent sock. The absorbent sock in MW-6 was checked and replaced.
October 2, 2000	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
December 14, 2000	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
January 23, 2001	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
February 6-7, 2001	TRW conducted the semi-annual (first quarter 2001) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and/or replaced.
March 21, 2001	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
May 1, 2001	Trident Environmental acquired the Midland Texas resources of TRW, Inc.

May 16, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
June 19, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
July 20, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
August 2-3, 2001	Trident conducted the annual (third quarter 2001) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and replaced.
September 11, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
October 9, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
November 8, 2001	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
December 10, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
January 14, 2002	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
February 17, 2002	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
March 11-12, 2002	TRW conducted the semi-annual (first quarter 2002) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-4, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and/or replaced.
April 9, 2002	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
May 14, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
June 18, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.

July 11, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
August 14, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
September 25-26, 2002	Trident conducted the annual (third quarter 2002) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and replaced.
October 24, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
November 22, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
December 17, 2002	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.

3.0 Procedures

During each sampling event, all on-site monitoring wells were gauged for depth to groundwater using a Solinst Model 101 water level indicator with the exception of MW-4 and MW-6, which were gauged using a Heron Model H.01L electronic water/product interface probe. During both sampling events in 2002 all of the monitoring wells were sampled, with the exception of MW-6 during the March 2002 sampling event due to presence of LNAPL. Immediately prior to collecting groundwater samples, a minimum of three well volumes was purged using a decontaminated 2-inch diameter submersible pump, or purged by hand using a decontaminated PVC bailer. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen (DO) were measured during and after purging using a Hanna Model 9143 DO/temperature meter, and a Horiba Model U-10 pH, conductivity, and temperature meter. Groundwater samples were collected after these parameters stabilized. A total of 504 gallons of water was purged from monitoring wells during the two 2002 sampling events. Groundwater samples were obtained using a new, clean, 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 benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. 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. The annual sampling event conducted on September 25-26, 2002, included a third and fourth set of water samples that were transferred into appropriately preserved containers for analysis of chlorides and total dissolved solids (TDS) and WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver). Samples for metals analysis were filtered in the field with a 45mm element. Also, ferrous iron was measured in the field using a Hach DR2010 spectrophotometer (Hach Method 8146). A summary of purging and sampling methods is provided on Table 1. 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. Most samples were shipped to Trace Analysis, Inc. of Lubbock, Texas for laboratory analysis. During the September 25-26, 2002 sampling event a portion of the samples were sent Cardinal Laboratories in Hobbs, New Mexico in order to meet the 48 hour holding time for nitrate.

Table 1

Summary of Purging and Sampling Methods

Monitoring Well No.	Sample Date	Purge Method	Purge Volume (gallons)	Sampling Method	Groundwater Analytes
MW-1	03/11/02	Pump	9	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	14	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-2	03/11/02	Pump	2	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Bailer	3	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-3	03/11/02	Pump	15	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	8	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-4	03/12/02	Pump	28	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Bailer	15	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-5	03/12/02	Pump	32	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	30	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-6	09/25/02	Bailer	7	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-7	03/11/02	Bailer	3	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Bailer	3	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-8	03/11/02	Pump	35	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	34	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-9	03/11/02	Pump	12	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Bailer	5	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10	03/12/02	Pump	24	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	30	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10D	03/12/02	Pump	15	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	14	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-11	03/12/02	Pump	24	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	30	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-12	03/12/02	Pump	28	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	30	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-13	03/12/02	Pump	24	Disposable bailer	BTEX and Bio-indicators
	09/25/02	Pump	30	Disposable bailer	BTEX, Metals, Ions, Bio-indicators

BTEX - benzene, toluene, ethylbenzene, xylenes
WQCC Metals - Ag, Al, As, Ba, Cd, Cr, Fe, and Mn
Major ions - TDS, Cl, NO_3, and SO_4
Bio-indicators - DO, NO3, SO4
Monitoring well MW-6 was not sampled in March 2002 due to presence of free product.

4.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by Trident on September 25, 2002, the groundwater conditions at the Linam Ranch Plant are characterized below.

- The depth to the water table is approximately 48 feet below ground surface in the site area.
- The hydraulic gradient is approximately 0.001 feet/foot, across the entire property with a maximum gradient of 0.0025 feet/foot.
- The direction of groundwater flow is to the southeast.
- The water table elevation has decreased an average of 0.67 feet across the site since August 2000.

The direction of groundwater flow and hydraulic gradient has remained consistent for the past seven and a half years, however the groundwater elevations have steadily decreased at the rate of approximately 0.2 feet per year during this time. Historical groundwater elevations and depth to water measurements are summarized on Table 2, and depicted graphically in Figure 1. Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the two year 2002 sampling events are presented in Figure 2A (March 11, 2002) and Figure 2B (September 25, 2002).

Table 2
Summary of Groundwater Elevations

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-1	05/22/94	3718.29	3720.18	43.90	3676.28	0.00
	05/17/95	3718.29	3720.18	45.50	3674.68	0.00
	01/17/96	3718.29	3720.18	43.95	3676.23	0.00
	04/24/96	3718.29	3720.18	44.81	3675.37	0.00
	01/22/97	3718.29	3720.18	45.73	3674.45	0.00
	08/15/97	3718.29	3720.18	45.55	3674.63	0.00
	01/22/98	3718.29	3720.18	45.99	3674.19	0.00
	07/20/98	3718.29	3720.18	46.51	3673.67	0.00
	02/09/99	3718.29	3720.18	46.42	3673.76	0.00
	08/24/99	3718.29	3720.18	44.97	3675.21	0.00
	02/21/00	3718.29	3720.18	44.77	3675.41	0.00
	08/17/00	3718.29	3720.18	43.47	3676.71	0.00
	02/06/01	3718.29	3720.18	43.19	3676.99	0.00
	08/02/01	3718.29	3720.18	45.37	3674.81	0.00
	03/11/02	3718.29	3720.18	46.14	3674.04	0.00
	09/25/02	3718.29	3720.18	45.75	3674.43	0.00
MW-2	05/22/94	3714.80	3717.24	34.95	3682.29	0.00
	05/17/95	3714.80	3717.24	43.75	3673.49	0.00
	01/22/97	3714.80	3717.24	44.05	3673.19	0.00
	01/22/98	3714.80	3717.24	44.44	3672.80	0.00
	07/20/98	3714.80	3717.24	44.87	3672.37	0.00
	02/09/99	3714.80	3717.24	44.83	3672.41	0.00
	08/24/99	3714.80	3717.24	42.81	3674.43	0.00
	02/21/00	3714.80	3717.24	44.56	3672.68	0.00
	08/17/00	3714.80	3717.24	37.81	3679.43	0.00
	02/06/01	3714.80	3717.24	43.19	3674.05	0.00
	08/02/01	3714.80	3717.24	44.55	3672.69	0.00
	03/11/02	3714.80	3717.24	45.17	3672.07	0.00
	09/25/02	3714.80	3717.24	44.98	3672.26	0.00
MW-3	05/22/94	3715.50	3717.70	46.23	3671.47	0.00
	05/17/95	3715.50	3717.70	46.98	3670.72	0.00
	11/14/95	3715.50	3717.70	46.40	3671.30	0.00
	04/24/96	3715.50	3717.70	46.57	3671.13	0.00
	01/22/97	3715.50	3717.70	47.23	3670.47	0.00
	01/22/98	3715.50	3717.70	47.74	3669.96	0.00
	07/20/98	3715.50	3717.70	47.90	3669.80	0.00
	02/09/99	3715.50	3717.70	48.11	3669.59	0.00
	08/24/99	3715.50	3717.70	48.02	3669.68	0.00
	02/21/00	3715.50	3717.70	48.19	3669.51	0.00
	08/17/00	3715.50	3717.70	48.02	3669.68	0.00
	02/06/01	3715.50	3717.70	48.22	3669.48	0.00
	08/02/01	3715.50	3717.70	48.39	3669.31	0.00
	03/11/02	3715.50	3717.70	48.56	3669.14	0.00
	09/25/02	3715.50	3717.70	48.67	3669.03	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

Table 2 (Continued)
Summary of Groundwater Elevations

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-4	12/01/92	3720.46	3722.45	45.35	3677.10	0.00
	05/22/94	3720.46	3722.45	45.49	3676.96	0.00
	05/17/95	3720.46	3722.45	47.20	3675.43	0.22
	11/15/95	3720.46	3722.45	46.71	3675.75	0.01
	01/17/96	3720.46	3722.45	46.18	3676.27	0.00
	04/24/96	3720.46	3722.45	46.95	3675.50	0.00
	01/22/97	3720.46	3722.45	48.19	3674.29	0.04
	08/15/97	3720.46	3722.45	48.55	3674.12	0.27
	01/22/98	3720.46	3722.45	49.11	3674.52	1.44
	07/20/98	3720.46	3722.45	48.99	3673.76	0.36
	02/09/99	3720.46	3722.45	48.11	3674.45	0.13
	08/24/99	3720.46	3722.45	47.73	3675.44	0.88
	02/21/00	3720.46	3722.45	46.66	3675.81	0.03
	08/17/00	3720.46	3722.45	46.39	3676.07	0.01
	02/06/01	3720.46	3722.45	47.06	3675.39	0.01
	08/02/01	3720.46	3722.45	47.66	3674.80	0.01
	03/11/02	3720.46	3722.45	47.86	3674.59	<0.01
	09/25/02	3720.46	3722.45	47.33	3675.13	0.01
MW-5	12/01/92	3721.53	3723.60	45.95	3677.65	0.00
	05/22/94	3721.53	3723.60	46.27	3677.33	0.00
	05/17/95	3721.53	3723.60	48.17	3675.43	0.01
	11/15/95	3721.53	3723.60	46.98	3676.62	0.00
	01/17/96	3721.53	3723.60	47.37	3676.23	0.00
	04/24/96	3721.53	3723.60	48.09	3675.51	0.00
	01/22/97	3721.53	3723.60	49.25	3674.35	0.00
	08/15/97	3721.53	3723.60	49.64	3673.96	0.00
	01/22/98	3721.53	3723.60	48.86	3674.74	0.00
	07/20/98	3721.53	3723.60	49.39	3674.21	0.00
	02/09/99	3721.53	3723.60	48.76	3674.84	0.00
	08/24/99	3721.53	3723.60	48.13	3675.47	0.00
	02/21/00	3721.53	3723.60	47.76	3675.84	0.00
	08/17/00	3721.53	3723.60	47.94	3675.66	0.00
	02/06/01	3721.53	3723.60	48.36	3675.24	0.00
	08/02/01	3721.53	3723.60	48.78	3674.82	0.00
	03/11/02	3721.53	3723.60	48.53	3675.07	0.00
	09/25/02	3721.53	3723.60	48.61	3674.99	0.00
MW-6	12/01/92	3720.99	3723.08	46.21	3676.87	0.00
	05/22/94	3720.99	3723.08	46.38	3676.70	0.00
	05/17/95	3720.99	3723.08	48.25	3674.87	0.05
	11/15/95	3720.99	3723.08	46.29	3676.80	0.01
	01/17/96	3720.99	3723.08	46.90	3676.18	0.00
	04/24/96	3720.99	3723.08	46.72	3676.37	0.01
	01/22/97	3720.99	3723.08	48.89	3674.21	0.02
	08/15/97	3720.99	3723.08	49.21	3673.91	0.05
	01/22/98	3720.99	3723.08	48.91	3674.21	0.05
	07/20/98	3720.99	3723.08	49.56	3673.59	0.08
	02/09/99	3720.99	3723.08	49.24	3673.84	0.00
	08/24/99	3720.99	3723.08	48.22	3674.86	0.00
	02/21/00	3720.99	3723.08	47.97	3675.11	0.00
	08/17/00	3720.99	3723.08	47.48	3675.61	0.01
	02/06/01	3720.99	3723.08	48.42	3674.75	0.11
	08/02/01	3720.99	3723.08	48.94	3674.15	0.01
	03/11/02	3720.99	3723.08	48.79	3674.30	0.01
	09/25/02	3720.99	3723.08	48.48	3674.61	0.01

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

Table 2 (Continued)
Summary of Groundwater Elevations

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-7	05/22/94	3728.57	3730.84	54.52	3676.32	0.00
	05/17/95	3728.57	3730.84	57.00	3673.84	0.00
	11/14/95	3728.57	3730.84	57.95	3672.89	0.00
	04/24/96	3728.57	3730.84	58.00	3672.84	0.00
	01/22/97	3728.57	3730.84	57.71	3673.13	0.00
	01/22/98	3728.57	3730.84	57.57	3673.27	0.00
	02/09/99	3728.57	3730.84	57.29	3673.55	0.00
	08/24/99	3728.57	3730.84	57.64	3673.20	0.00
	02/21/00	3728.57	3730.84	57.39	3673.45	0.00
	08/17/00	3728.57	3730.84	57.26	3673.58	0.00
	02/06/01	3728.57	3730.84	56.66	3674.18	0.00
	08/02/01	3728.57	3730.84	58.15	3672.69	0.00
	03/11/02	3728.57	3730.84	56.77	3674.07	0.00
	09/25/02	3728.57	3730.84	57.41	3673.43	0.00
MW-8	05/22/94	3714.18	3716.18	41.35	3674.83	0.00
	05/17/95	3714.18	3716.18	43.45	3672.73	0.00
	01/17/96	3714.18	3716.18	41.71	3674.47	0.00
	04/24/96	3714.18	3716.18	42.82	3673.36	0.00
	01/22/97	3714.18	3716.18	43.40	3672.78	0.00
	08/15/97	3714.18	3716.18	44.14	3672.04	0.00
	01/22/98	3714.18	3716.18	44.31	3671.87	0.00
	07/20/98	3714.18	3716.18	44.57	3671.61	0.00
	02/09/99	3714.18	3716.18	44.70	3671.48	0.00
	08/24/99	3714.18	3716.18	43.62	3672.56	0.00
	02/21/00	3714.18	3716.18	44.25	3671.93	0.00
	08/17/00	3714.18	3716.18	41.52	3674.66	0.00
	02/06/01	3714.18	3716.18	43.58	3672.60	0.00
	08/02/01	3714.18	3716.18	44.92	3671.26	0.00
	03/11/02	3714.18	3716.18	44.67	3671.51	0.00
	09/25/02	3714.18	3716.18	44.59	3671.59	0.00
MW-9	05/22/94	3720.48	3722.48	49.59	3672.89	0.00
	05/17/95	3720.48	3722.48	50.60	3671.88	0.00
	11/14/95	3720.48	3722.48	50.02	3672.46	0.00
	01/17/96	3720.48	3722.48	49.84	3672.64	0.00
	04/24/96	3720.48	3722.48	50.08	3672.40	0.00
	02/07/97	3720.48	3722.48	50.96	3671.52	0.00
	08/15/97	3720.48	3722.48	51.34	3671.14	0.00
	01/22/98	3720.48	3722.48	51.48	3671.00	0.00
	07/20/98	3720.48	3722.48	51.58	3670.90	0.00
	02/09/99	3720.48	3722.48	51.81	3670.67	0.00
	08/24/99	3720.48	3722.48	51.59	3670.89	0.00
	02/21/00	3720.48	3722.48	51.70	3670.78	0.00
	08/17/00	3720.48	3722.48	51.56	3670.92	0.00
	02/06/01	3720.48	3722.48	51.62	3670.86	0.00
	08/02/01	3720.48	3722.48	51.86	3670.62	0.00
	03/11/02	3720.48	3722.48	51.87	3670.61	0.00
	09/25/02	3720.48	3722.48	51.87	3670.61	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

Table 2 (Continued)
Summary of Groundwater Elevations

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-10	05/17/95	3720.76	3722.90	50.45	3672.45	0.00
	11/14/95	3720.76	3722.90	49.85	3673.05	0.00
	01/17/96	3720.76	3722.90	49.82	3673.08	0.00
	04/24/96	3720.76	3722.90	50.15	3672.75	0.00
	02/07/97	3720.76	3722.90	51.12	3671.78	0.00
	08/15/97	3720.76	3722.90	51.49	3671.41	0.00
	01/22/98	3720.76	3722.90	51.57	3671.33	0.00
	07/20/98	3720.76	3722.90	51.68	3671.22	0.00
	02/09/99	3720.76	3722.90	51.88	3671.02	0.00
	08/24/99	3720.76	3722.90	51.51	3671.39	0.00
	02/21/00	3720.76	3722.90	51.66	3671.24	0.00
	08/17/00	3720.76	3722.90	51.37	3671.53	0.00
	02/06/01	3720.76	3722.90	51.54	3671.36	0.00
	08/02/01	3720.76	3722.90	51.84	3671.06	0.00
	03/11/02	3720.76	3722.90	51.80	3671.10	0.00
	09/25/02	3720.76	3722.90	51.77	3671.13	0.00
MW-10D	05/17/95	3720.85	3723.54	51.38	3672.16	0.00
	11/14/95	3720.85	3723.54	50.63	3672.91	0.00
	01/17/96	3720.85	3723.54	50.73	3672.81	0.00
	04/24/96	3720.85	3723.54	51.18	3672.36	0.00
	02/07/97	3720.85	3723.54	52.11	3671.43	0.00
	08/15/97	3720.85	3723.54	52.47	3671.07	0.00
	01/22/98	3720.85	3723.54	52.41	3671.13	0.00
	07/20/98	3720.85	3723.54	52.55	3670.99	0.00
	02/09/99	3720.85	3723.54	52.76	3670.78	0.00
	08/24/99	3720.85	3723.54	52.51	3671.03	0.00
	02/21/00	3720.85	3723.54	52.56	3670.98	0.00
	08/17/00	3720.85	3723.54	52.25	3671.29	0.00
	02/06/01	3720.85	3723.54	52.57	3670.97	0.00
	08/02/01	3720.85	3723.54	52.78	3670.76	0.00
	03/11/02	3720.85	3723.54	52.70	3670.84	0.00
	09/25/02	3720.85	3723.54	52.73	3670.81	0.00
MW-11	05/17/95	3722.02	3724.53	51.50	3673.03	0.00
	11/14/95	3722.02	3724.53	50.34	3674.19	0.00
	01/17/96	3722.02	3724.53	50.65	3673.88	0.00
	04/24/96	3722.02	3724.53	51.22	3673.31	0.00
	02/07/97	3722.02	3724.53	52.32	3672.21	0.00
	08/15/97	3722.02	3724.53	52.72	3671.81	0.00
	01/22/98	3722.02	3724.53	52.52	3672.01	0.00
	07/20/98	3722.02	3724.53	52.65	3671.88	0.00
	02/09/99	3722.02	3724.53	52.85	3671.68	0.00
	08/24/99	3722.02	3724.53	52.47	3672.06	0.00
	02/21/00	3722.02	3724.53	52.44	3672.09	0.00
	08/17/00	3722.02	3724.53	52.06	3672.47	0.00
	02/06/01	3722.02	3724.53	52.31	3672.22	0.00
	08/02/01	3722.02	3724.53	52.74	3671.79	0.00
	03/11/02	3722.02	3724.53	52.51	3672.02	0.00
	09/25/02	3722.02	3724.53	52.48	3672.05	0.00

* Elevations 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.

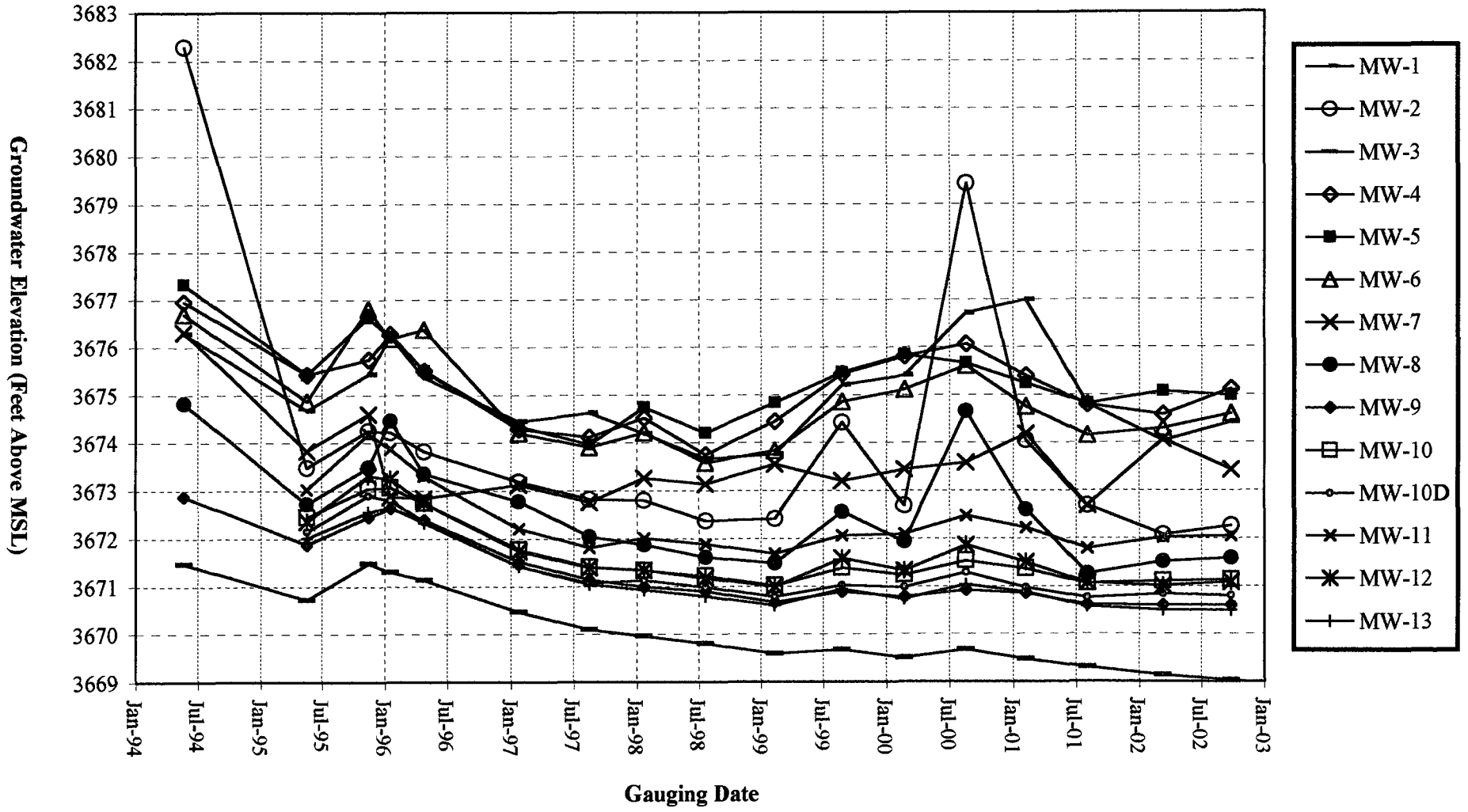
Groundwater direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

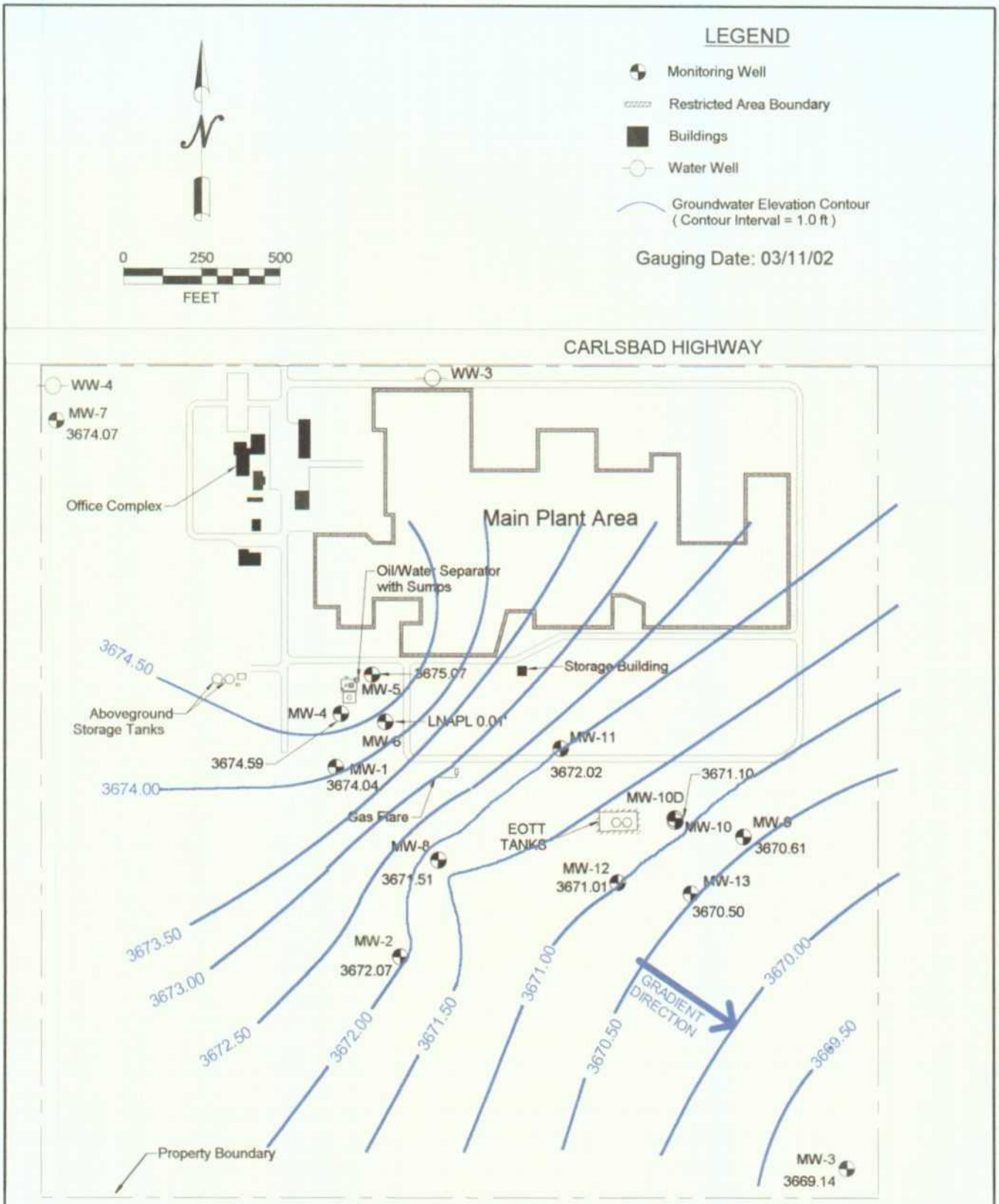
Table 2 (Continued)
Summary of Groundwater Elevations

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-12	05/17/95	3720.60	3722.84	50.47	3672.37	0.00
	11/14/95	3720.60	3722.84	49.52	3673.32	0.00
	01/17/96	3720.60	3722.84	49.59	3673.25	0.00
	04/24/96	3720.60	3722.84	50.09	3672.75	0.00
	02/07/97	3720.60	3722.84	51.10	3671.74	0.00
	08/15/97	3720.60	3722.84	51.44	3671.40	0.00
	01/22/98	3720.60	3722.84	51.50	3671.34	0.00
	07/20/98	3720.60	3722.84	51.66	3671.18	0.00
	02/09/99	3720.60	3722.84	51.84	3671.00	0.00
	08/24/99	3720.60	3722.84	51.25	3671.59	0.00
	02/21/00	3720.60	3722.84	51.51	3671.33	0.00
	08/17/00	3720.60	3722.84	50.98	3671.86	0.00
	02/06/01	3720.60	3722.84	51.34	3671.50	0.00
	08/02/01	3720.60	3722.84	51.77	3671.07	0.00
	03/11/02	3720.60	3722.84	51.83	3671.01	0.00
	09/25/02	3720.60	3722.84	51.75	3671.09	0.00
MW-13	05/17/95	3721.63	3723.99	51.97	3672.02	0.00
	11/14/95	3721.63	3723.99	51.42	3672.57	0.00
	01/17/96	3721.63	3723.99	51.33	3672.66	0.00
	04/24/96	3721.63	3723.99	51.65	3672.34	0.00
	02/07/97	3721.63	3723.99	52.56	3671.43	0.00
	08/15/97	3721.63	3723.99	52.94	3671.05	0.00
	01/22/98	3721.63	3723.99	53.06	3670.93	0.00
	07/20/98	3721.63	3723.99	53.19	3670.80	0.00
	02/09/99	3721.63	3723.99	53.39	3670.60	0.00
	08/24/99	3721.63	3723.99	53.05	3670.94	0.00
	02/21/00	3721.63	3723.99	53.25	3670.74	0.00
	08/17/00	3721.63	3723.99	52.95	3671.04	0.00
	02/06/01	3721.63	3723.99	53.11	3670.88	0.00
	08/02/01	3721.63	3723.99	53.41	3670.58	0.00
	03/11/02	3721.63	3723.99	53.49	3670.50	0.00
	09/25/02	3721.63	3723.99	53.49	3670.50	0.00

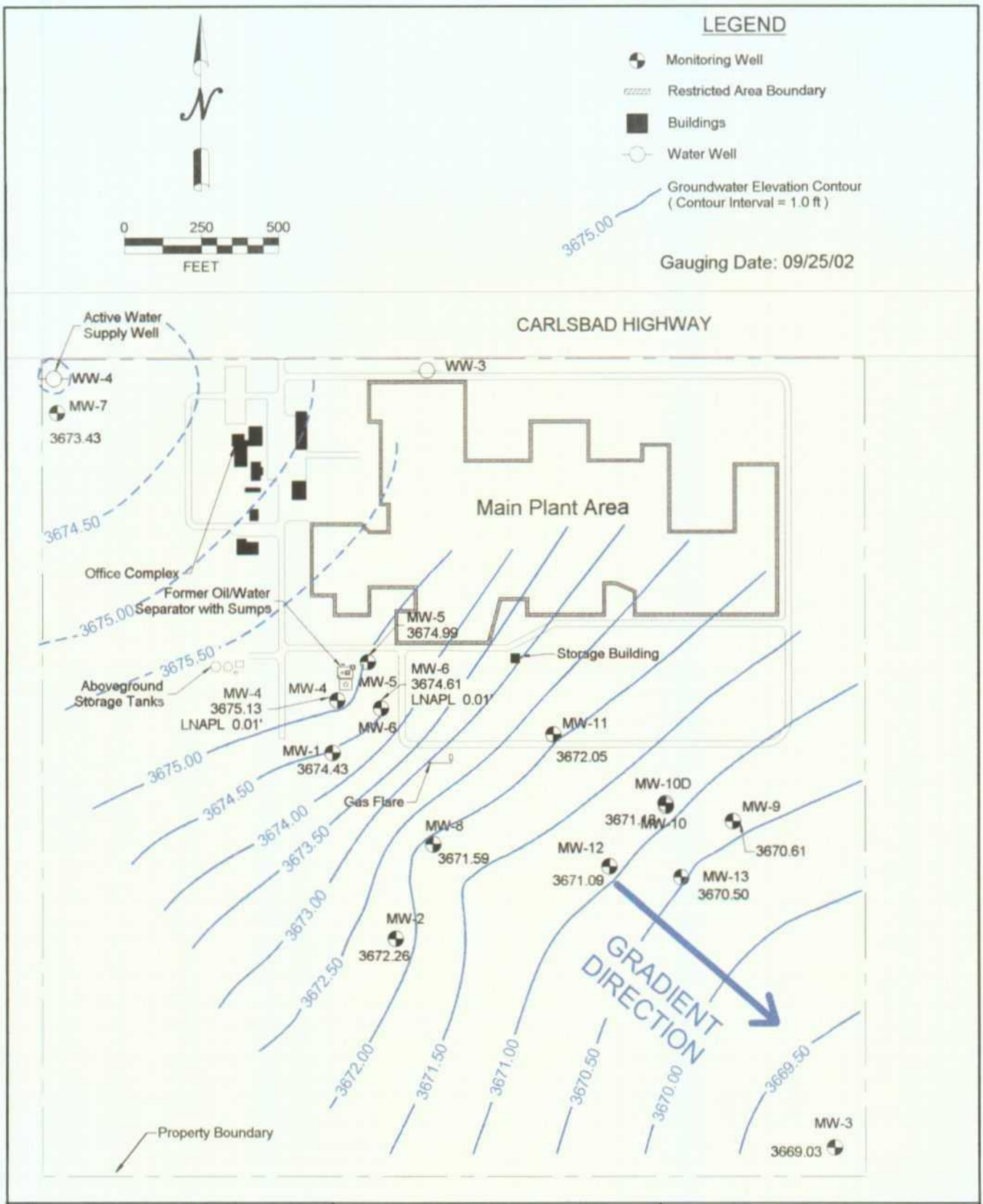
* Elevations surveyed by John W. West Engineering Company of Hobbs, NM.
The monitoring well casings were marked on the north side to provide consistent reference points for future gauging operations.
Groundwater direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

FIGURE 1
Groundwater Elevation Versus Time





TRIDENT ENVIRONMENTAL	CLIENT: DEFS - Linam Ranch Plant	Figure 2A
	DATE: 03/11/02 FILE: LANAM1	GROUNDWATER
	AUTHOR: DTL DRAWN BY: DTL	ELEVATION MAP
	CK'D BY: GJV SCALE: 1"=500'	



TRIDENT ENVIRONMENTAL	CLIENT: DEFS - Linam Ranch Plant	Figure 2B
	DATE: 09/25/02 FILE: LINAM0902	GROUNDWATER ELEVATION MAP
	AUTHOR: GJV DRAWN BY: GJV	
	CK'D BY: DTL SCALE: 1"=500'	

5.0 Groundwater Quality Conditions

5.1 Distribution of Hydrocarbons in Groundwater

A historical listing of benzene, toluene, ethylbenzene and xylene (BTEX) concentrations obtained from the on site monitoring wells is summarized in Table 3. Figures 3 (A through H) graphically depict the BTEX concentrations in groundwater and the groundwater elevations versus time (monitoring period) for monitoring wells MW-4, MW-5, MW-6, MW-9, MW-10, MW-10D, MW-11, and MW-13, respectively. Hydrocarbon concentration maps depicting the BTEX concentrations for the two 2002 sampling events are presented in Figure 4A (March 11-12, 2002) and Figure 4B (September 25-26, 2002). Based on the analytical results, the distribution of hydrocarbons at the Linam Ranch Plant is described below.

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-10D, MW-11, MW-12 and MW-13 were below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.

- Benzene levels in MW-4 (18.8 mg/L), MW-5 (0.381 mg/L), MW-6 (1.29 mg/L), MW-9 (0.071 mg/L) and MW-10 (3.48 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (liquid waste disposal area) and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

Table 3
Summary of Dissolved BTEX Concentrations

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	09/20/91	0.0053	0.0067	0.001	<0.001
	11/03/92	0.0015	0.0015	<0.001	0.010
	12/02/92	0.0013	0.0014	<0.001	0.006
	01/12/94	0.0039	<0.001	0.0021	0.002
	05/17/95	<0.002	<0.002	<0.002	<0.002
	08/25/99	<0.005	<0.005	<0.005	0.006
	02/22/00	<0.005	<0.005	<0.005	0.006
	08/18/00	<0.001	<0.001	<0.001	0.011
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.003	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.005	<0.005	<0.005	<0.005
MW-2	09/20/91	<0.001	<0.001	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	<0.001	<0.001	<0.001	<0.001
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.007	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
MW-3	09/20/91	<0.001	0.0021	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	02/09/99	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/17/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.002	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
MW-4	11/03/92	**16.0**	**8.0**	0.7	**1.8**
	12/02/92	**17.0**	**8.2**	0.53	**1.3**
	01/10/94	**18.0**	**10.0**	0.5	**1.3**
	05/17/95	**20.9**	**1.35**	<0.2	**11.4**
	03/12/02	**17.9**	<0.100	0.450	0.166
	09/25/02	**18.8**	<0.100	0.526	<0.100
MW-5	11/03/92	0.003	0.0034	0.003	0.034
	12/02/92	0.0091	0.0041	0.0082	0.037
	01/10/94	**0.300**	0.190	0.160	0.490
	05/17/95	**0.090**	0.014	0.138	**0.831**
	08/25/99	**0.137**	0.037	0.262	0.179
	02/23/00	**0.068**	<0.005	0.13	0.09
	08/18/00	<0.005	<0.005	0.006	0.008
	02/08/01	<0.005	<0.005	0.084	<0.005
	08/03/01	<0.005	<0.005	<0.005	<0.005
	03/12/02	**0.062**	<0.001	0.097	<0.001
	09/26/02	**0.381**	<0.050	0.588	0.112

Table 3
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-6	11/03/92	**0.340**	0.023	0.051	0.120
	12/02/92	**0.520**	0.020	0.058	0.120
	01/10/94	**0.770**	0.0029	0.096	0.210
	05/17/95	**0.980**	0.007	0.087	0.181
	09/25/02	**1.29**	<0.050	0.134	0.058
MW-7	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/17/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	<0.005	<0.005	<0.005	<0.005
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/26/02	<0.005	<0.005	<0.005	<0.005
MW-8	02/09/94	<0.001	<0.005	<0.005	<0.005
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	0.002	<0.001	<0.001	<0.001
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	<0.001	<0.001	<0.001	<0.001
	03/11/02	<0.001	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
MW-9	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	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
	08/15/97	<0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/20/98	<0.001	<0.001	<0.001	<0.001
	02/09/99	**0.011**	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	**0.014**	<0.005	<0.005	<0.005
	08/18/00	**0.036**	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	**0.038**	<0.001	<0.001	<0.001
	03/11/02	**0.048**	<0.001	<0.001	<0.001
	09/25/02	**0.071**	<0.001	<0.001	0.002
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 8021 except for samples obtained on May 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 3
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-10	05/17/95	**3.225**	0.052	0.049	0.169
	11/14/95	**5.230**	0.001	<0.001	0.406
	01/17/96	**6.110**	**0.863**	**1.140**	**1.050**
	04/24/96	**6.940**	<0.010	**1.190**	0.127
	01/22/97	**6.41**	**1.63**	0.294	**8.97**
	08/15/97	**5.63**	**1.35**	0.479	**0.453**
	01/22/98	**7.03**	**1.93**	**0.802**	**0.635**
	07/22/98	**7.18**	**2.34**	**0.777**	0.606
	02/09/99	**4.87**	0.32	0.516	0.372
	08/25/99	**5.58**	0.658	0.557	0.359
	02/23/00	**2.35**	0.129	0.164	0.124
	08/18/00	**3.11**	0.025	0.072	0.038
	02/08/01	**1.23**	0.082	0.102	0.086
	08/03/01	**1.64**	<0.02	0.119	<0.02
	03/12/02	**3.26**	0.178	0.251	0.550
	09/26/02	**3.48**	<0.100	0.290	0.155
MW-10D	05/17/95	**0.096**	0.004	<0.001	0.008
	11/14/95	**0.125**	0.001	<0.001	0.011
	01/17/96	**0.841**	0.001	<0.001	0.047
	04/24/96	**8.140**	0.046	**1.170**	0.076
	01/22/97	**0.365**	<0.005	<0.005	<0.005
	08/15/97	**0.221**	<0.01	<0.01	<0.01
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	**0.184**	0.014	0.008	0.006
	02/09/99	0.009	<0.005	<0.005	<0.005
	08/25/99	**0.036**	<0.001	0.001	0.002
	02/23/00	**0.014**	<0.005	<0.005	<0.005
	08/18/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/03/01	<0.001	<0.001	<0.001	<0.001
	03/12/02	0.002	<0.001	<0.001	<0.001
	09/25/02	<0.001	<0.001	<0.001	<0.001
MW-11	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	**0.306**	<0.001	<0.001	0.013
	01/17/96	**0.549**	0.004	0.002	0.031
	04/24/96	**0.520**	<0.002	<0.002	<0.002
	01/22/97	**0.267**	<0.001	<0.001	0.017
	08/15/97	**0.164**	<0.001	0.002	0.007
	01/22/98	**0.291**	0.004	<0.001	0.015
	07/22/98	**0.061**	<0.001	<0.001	0.010
	02/09/99	**0.018**	<0.001	<0.001	<0.001
	08/24/99	0.005	<0.001	<0.001	<0.001
	02/23/00	**0.02**	<0.001	0.002	0.008
	08/18/00	0.009	<0.005	<0.005	<0.005
	02/07/01	**0.013**	<0.001	<0.001	<0.001
	08/03/01	0.002	<0.001	<0.001	<0.001
	03/12/02	0.005	<0.001	<0.001	<0.001
	09/26/02	0.002	<0.001	<0.001	<0.001

Table 3
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-12	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	<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
	08/15/97	0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	0.002	<0.001	<0.001	<0.001
	02/09/99	0.001	<0.001	<0.001	<0.001
	08/24/99	0.003	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/18/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.001	<0.001	<0.001	<0.001
	08/03/01	<0.001	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001
	09/26/02	<0.001	<0.001	<0.001	<0.001
MW-13	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	0.003	<0.001	0.001	<0.001
	01/17/96	<0.001	<0.001	<0.001	<0.001
	04/24/96	<0.001	<0.001	<0.001	<0.001
	01/22/97	**0.048**	<0.001	<0.001	<0.001
	08/15/97	**0.132**	<0.001	<0.001	0.005
	01/22/98	**0.082**	<0.001	<0.001	<0.001
	07/20/98	**0.061**	<0.001	<0.001	<0.001
	02/09/99	**0.082**	<0.001	<0.001	<0.001
	08/24/99	**0.062**	<0.001	<0.001	<0.001
	02/23/00	**0.08**	<0.001	<0.001	<0.001
	08/18/00	**0.04**	<0.005	<0.005	<0.005
	02/07/01	**0.023**	<0.005	<0.005	<0.005
	08/03/01	0.002	<0.001	<0.001	<0.001
	03/12/02	<0.001	<0.001	<0.001	<0.001
	09/26/02	<0.001	<0.001	<0.001	<0.001
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 8021 except for samples obtained on May 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

FIGURE 3A
BTEX Concentration and Groundwater Elevation Versus Time (MW-4)

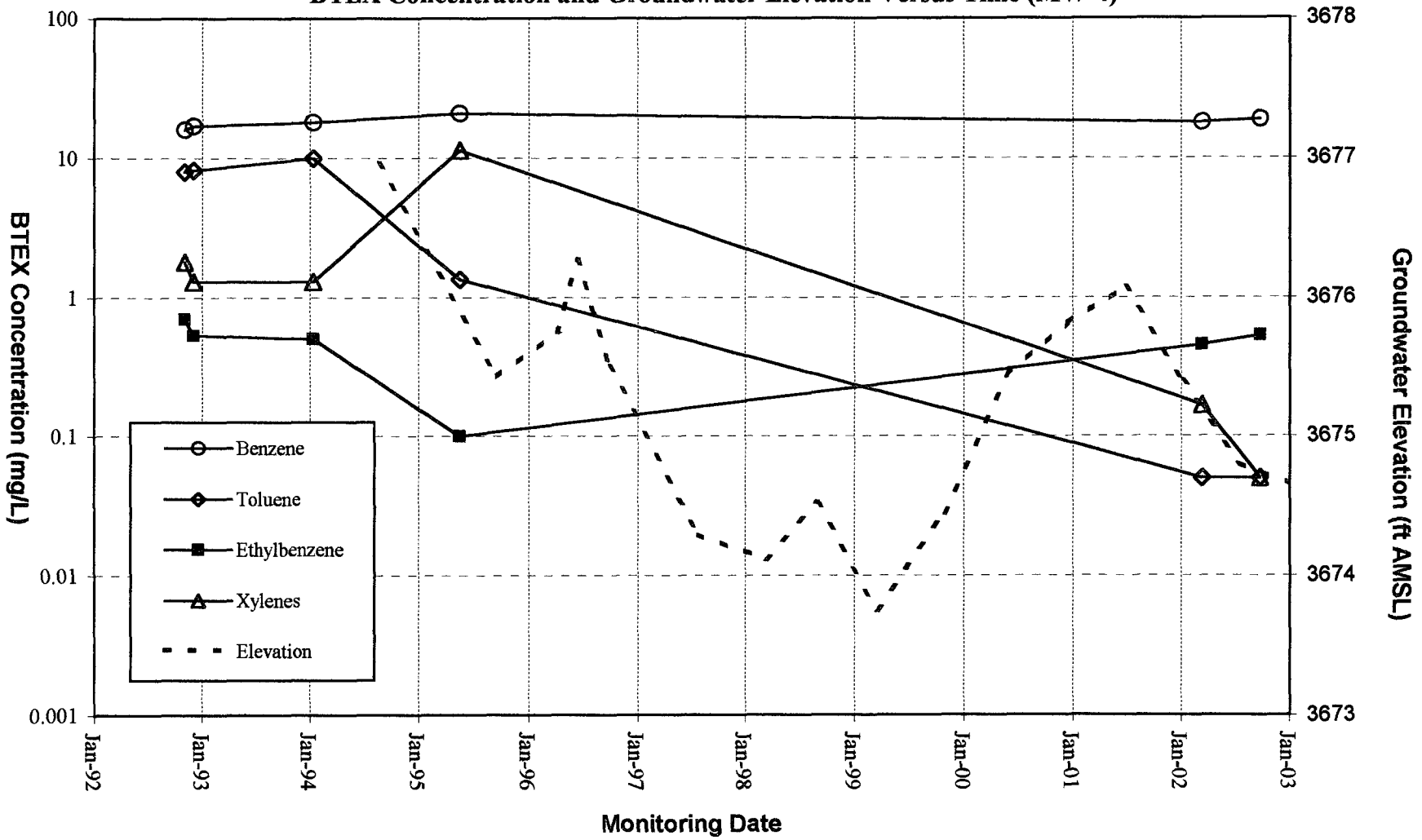


FIGURE 3B
BTEX Concentration and Groundwater Elevation Versus Time (MW-5)

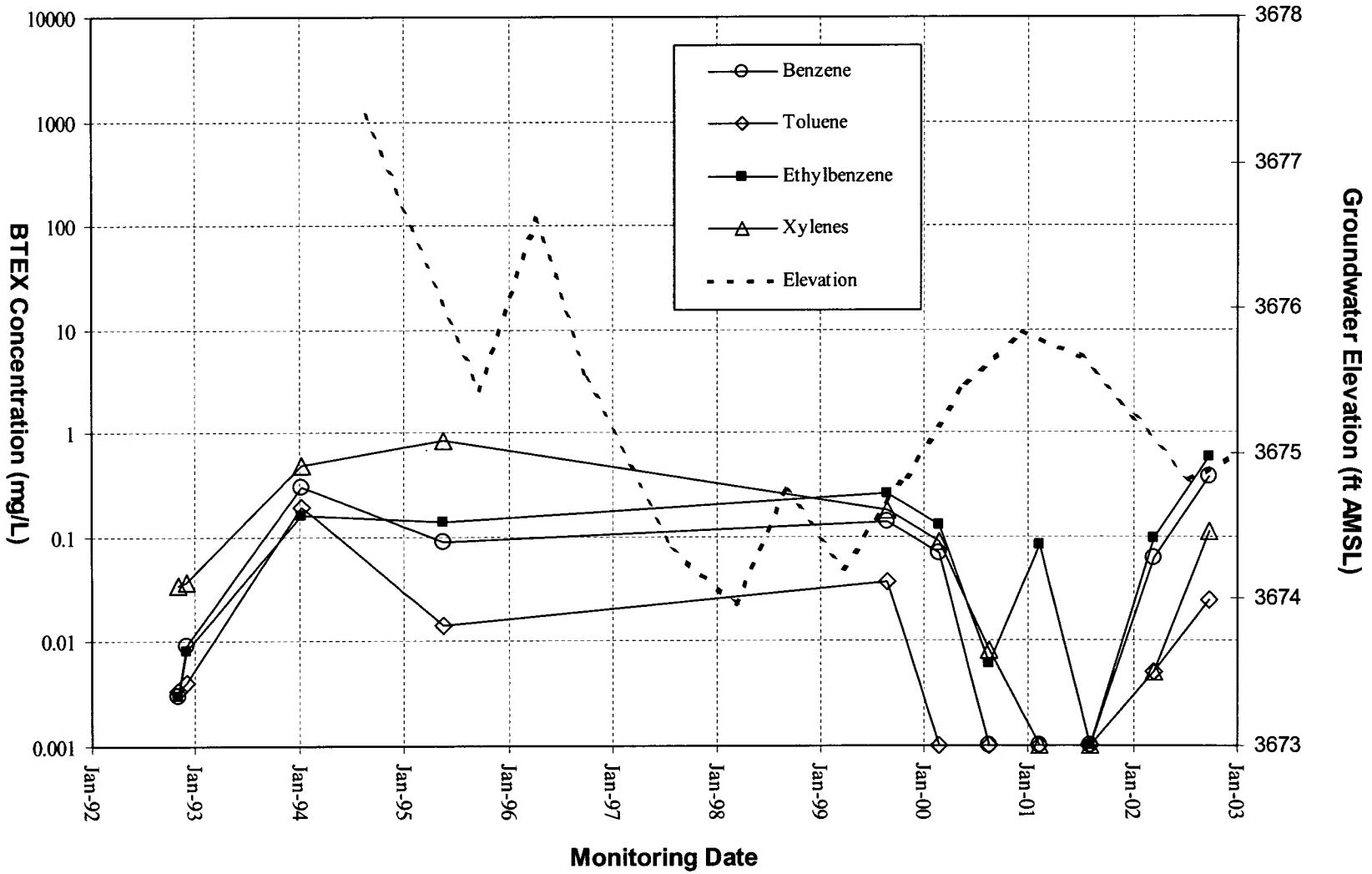


FIGURE 3C
BTEX Concentration and Groundwater Elevation Versus Time (MW-6)

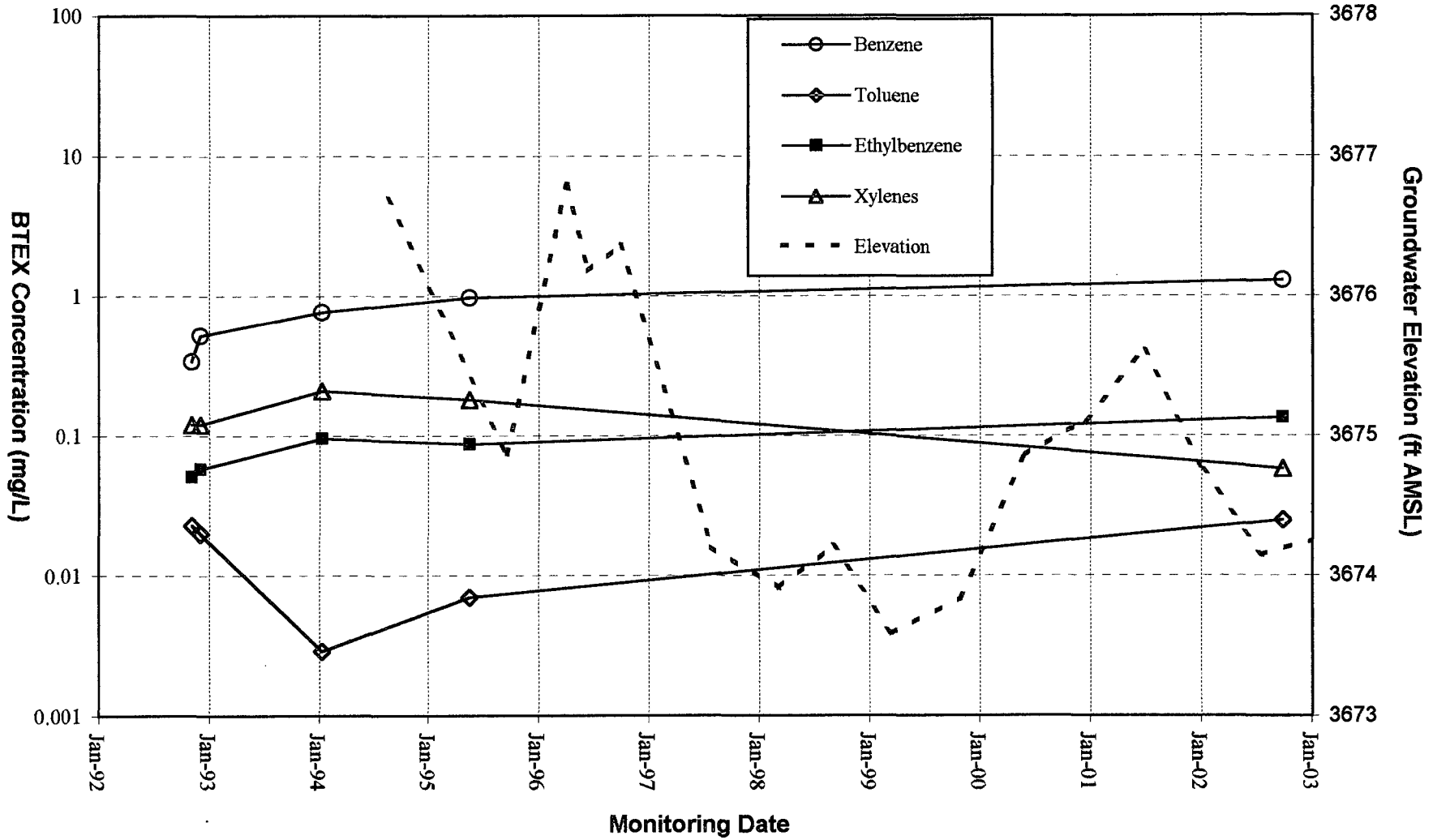


FIGURE 3D
BTEX Concentration and Groundwater Elevation Versus Time (MW-9)

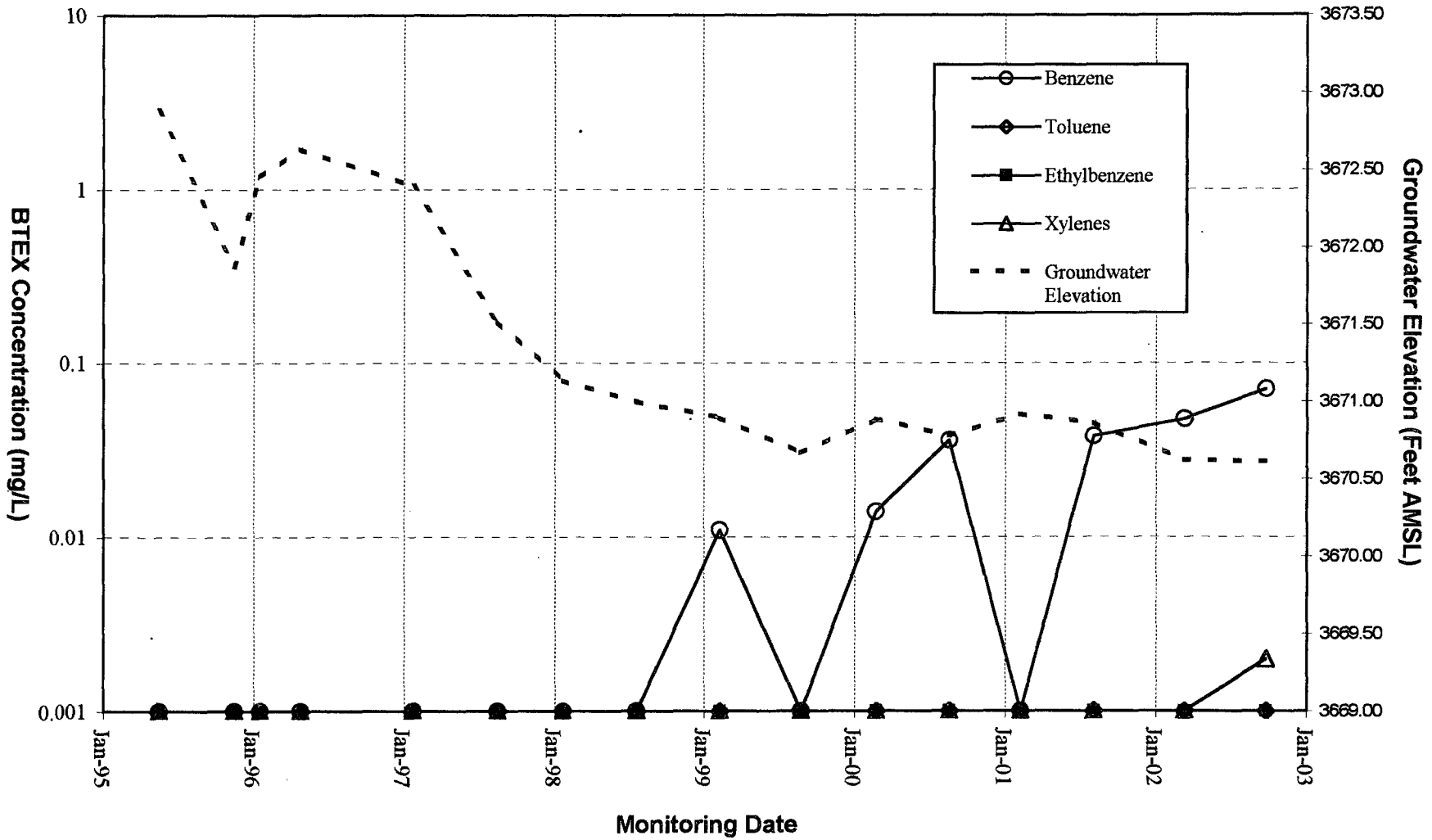


FIGURE 3E
BTEX Concentration and Groundwater Elevation Versus Time (MW-10)

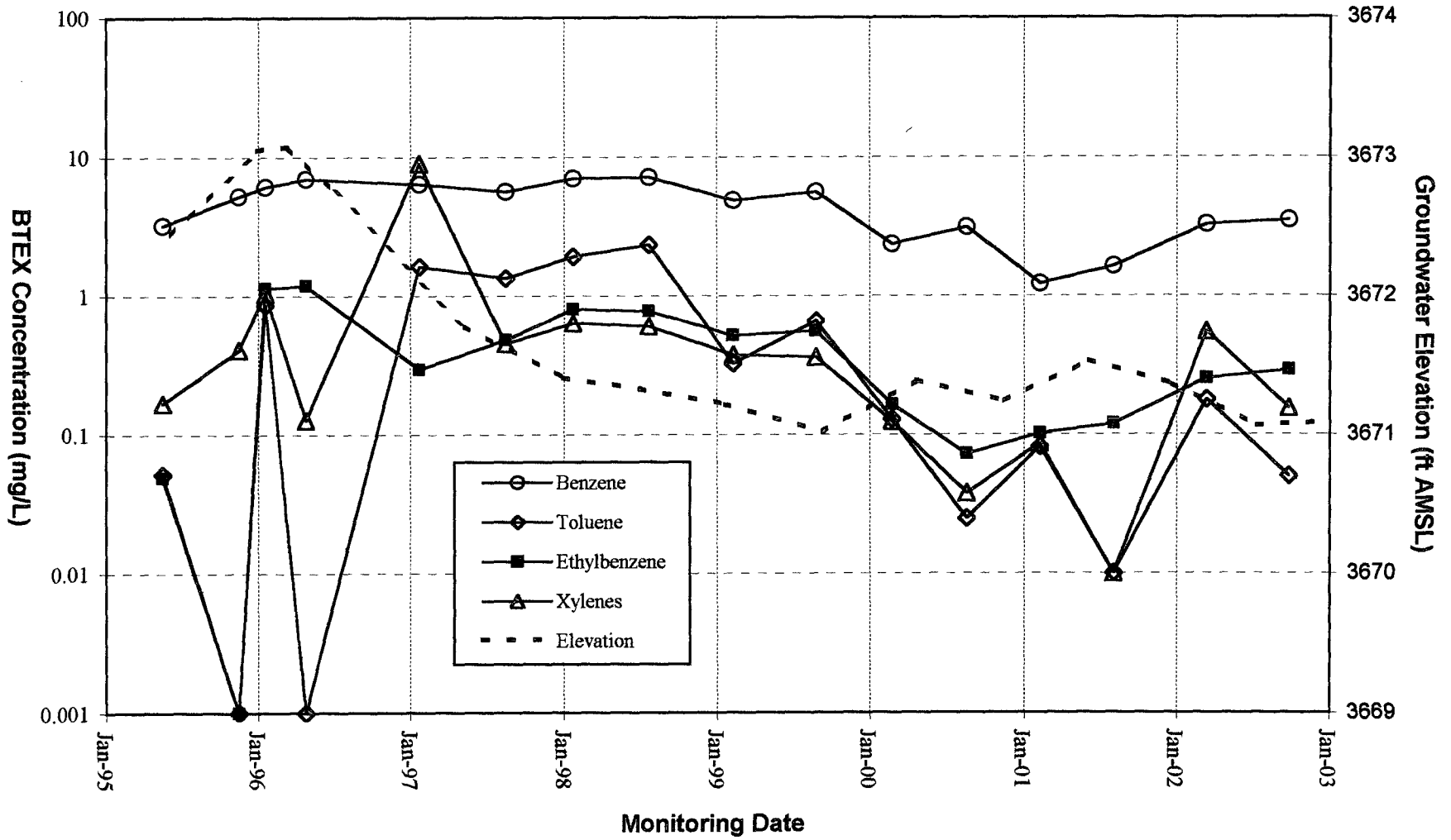


FIGURE 3F
BTEX Concentration and Groundwater Elevation Versus Time (MW-10D)

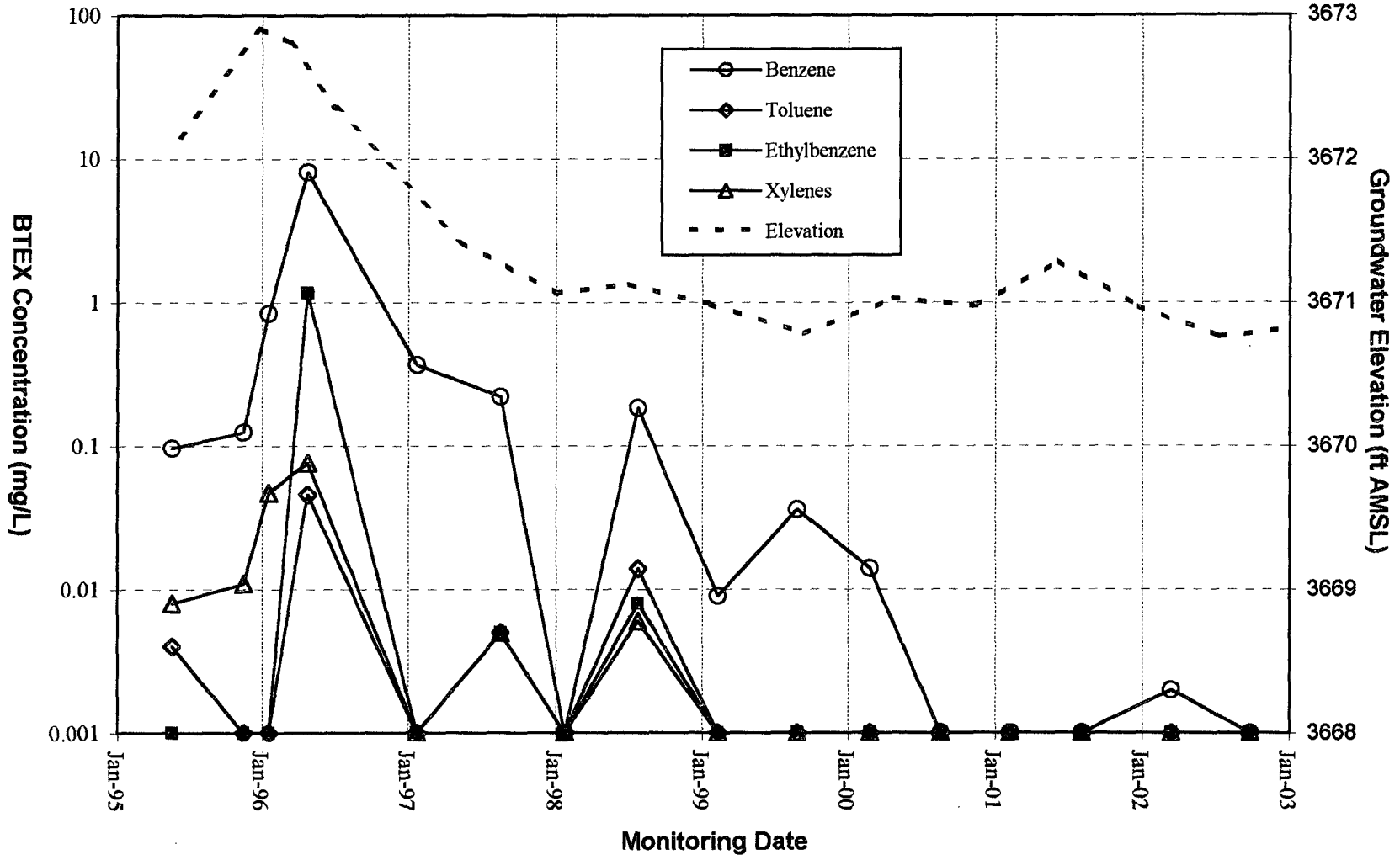


FIGURE 3G
BTEX Concentration and Groundwater Elevation Versus Time (MW-11)

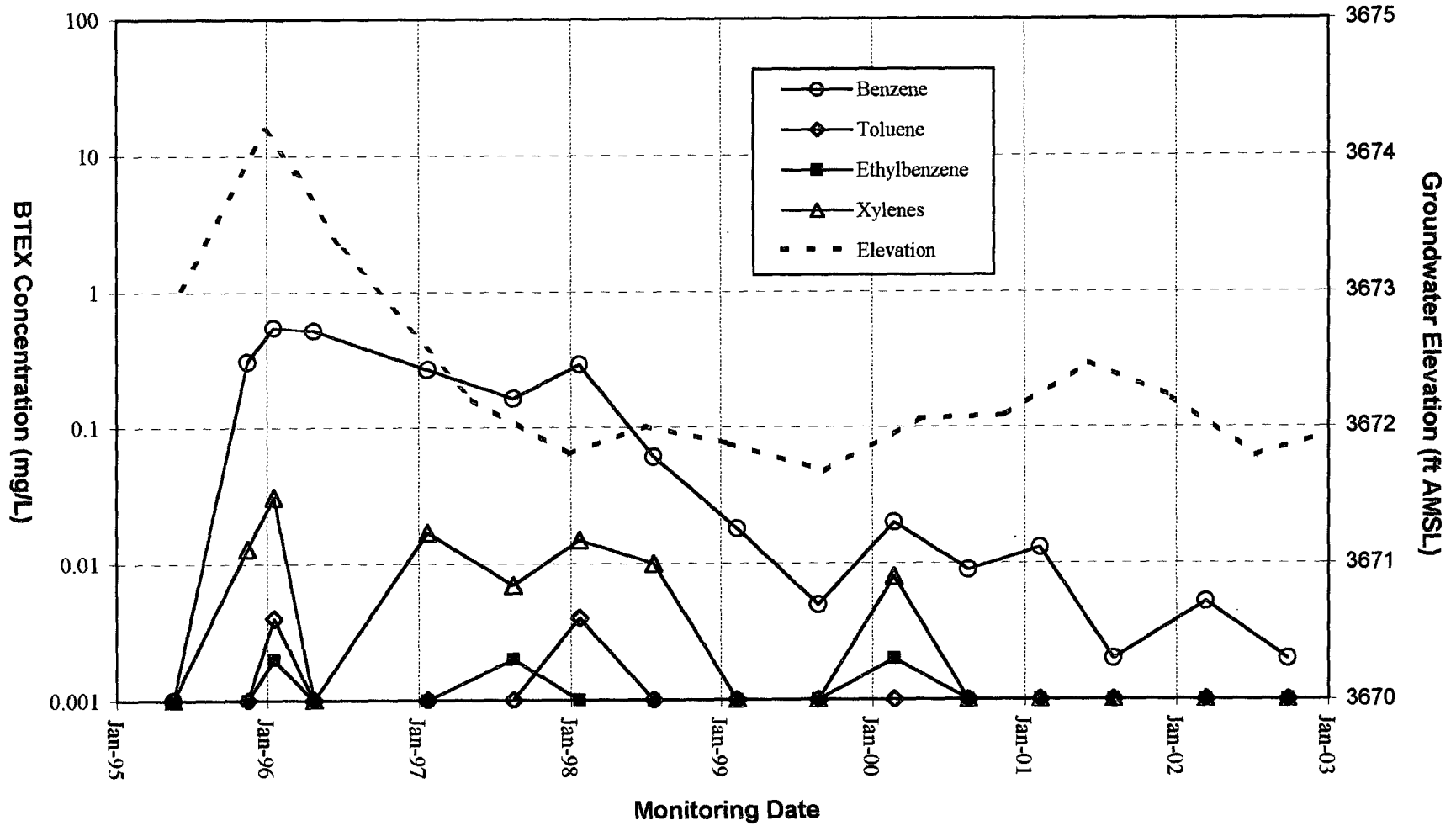
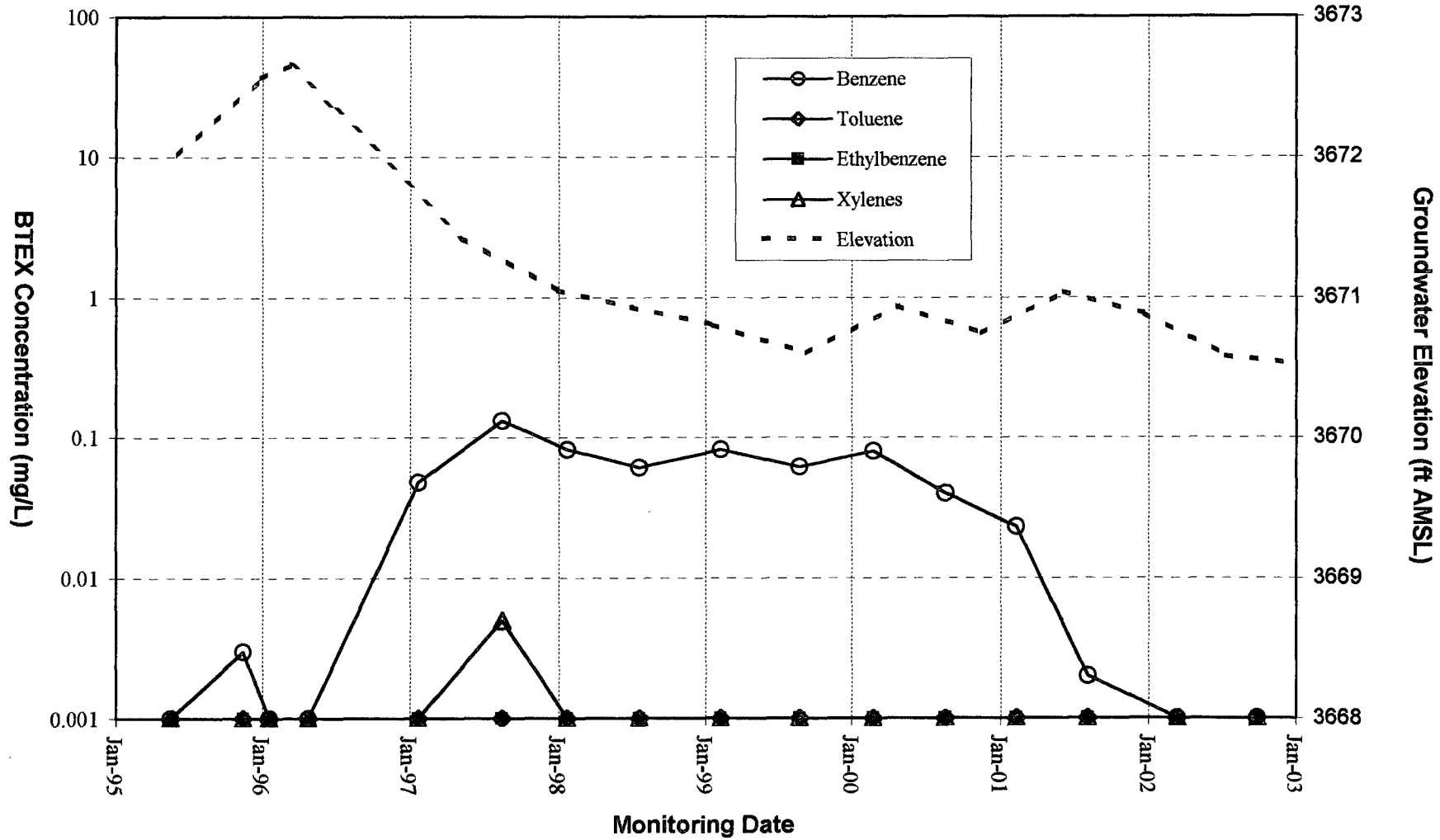
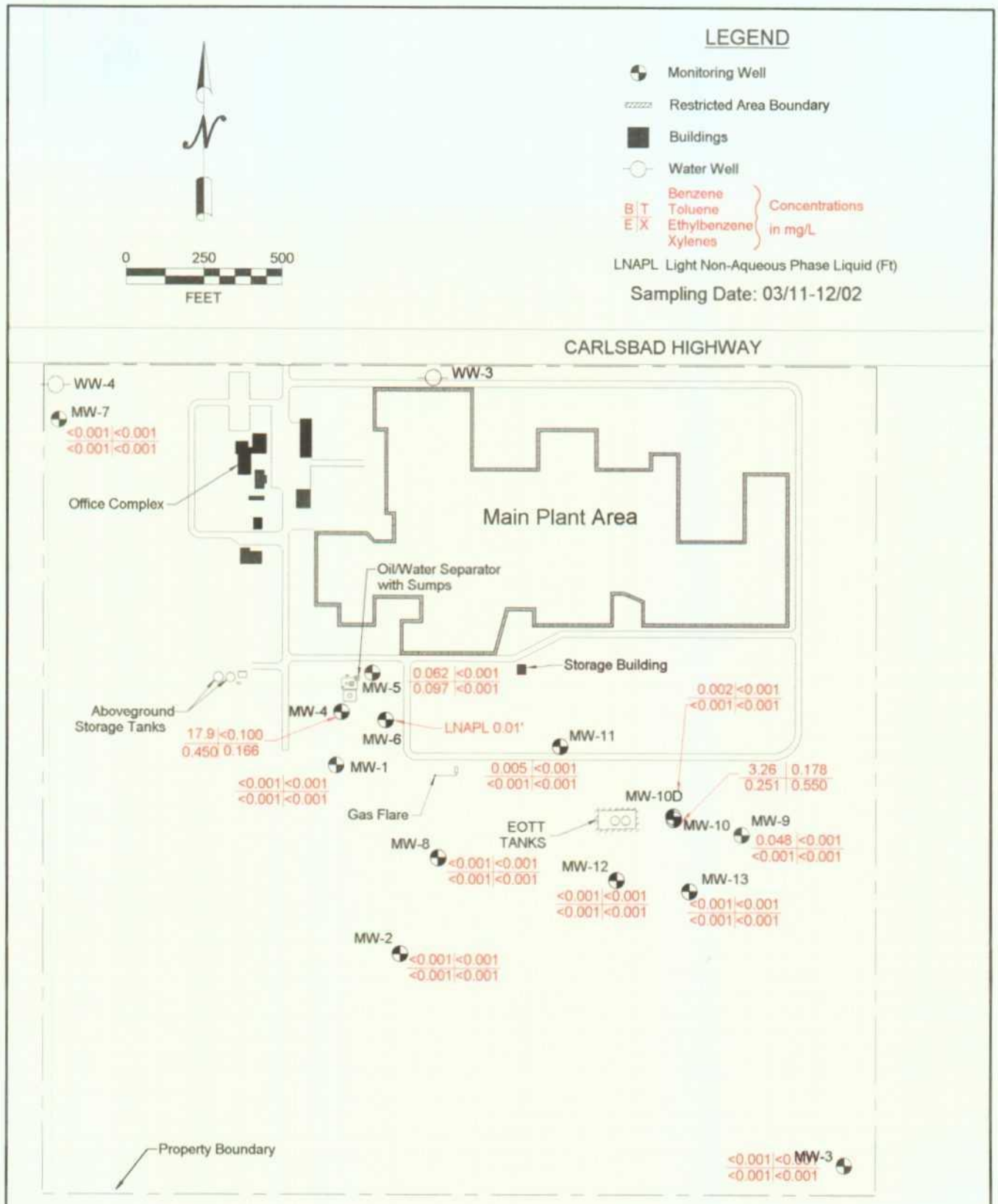


FIGURE 3H
BTEX Concentration and Groundwater Elevation Versus Time (MW-13)

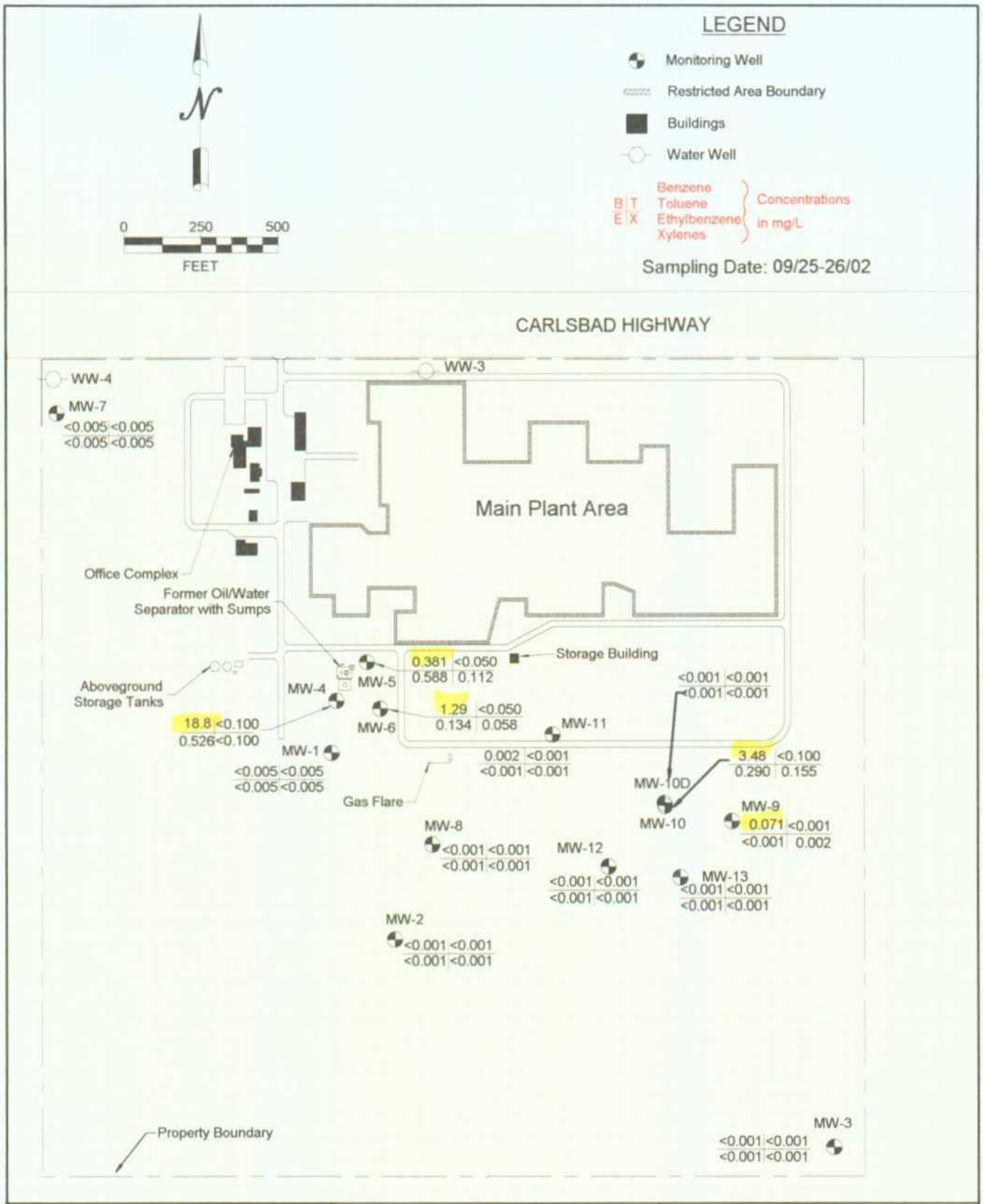




TRIDENT ENVIRONMENTAL

CLIENT: DEFS - Linam Ranch Plant	
DATE: 03/11-12/02	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: DTL
CK'D BY: GJV	SCALE: 1"=500'

Figure 4A
BTEX
CONCENTRATION
MAP



TRIDENT ENVIRONMENTAL	CLIENT: DEFS - Linam Ranch Plant	Figure 4B BTEX CONCENTRATION MAP
	DATE: 09/25-26/02 FILE: LINAM0902	
	AUTHOR: GJV DRAWN BY: GJV	
	CK'D BY: DTL SCALE: 1"=500'	

5.2 Distribution of WQCC Metals and Ions in Groundwater

Historical groundwater sample analytical results for WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver) and selected ions (chloride and TDS) are presented in Table 4. The WQCC standards are also listed in the table 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.

During the 2002 annual sampling event, the WQCC standard for iron was exceeded in the following wells MW-4 (12.6 mg/L), MW-5 (7.30 mg/L), MW-6 (7.13 mg/L), and MW10D (1.05 mg/L), and manganese in MW-5 (0.55 mg/L), MW-10 (0.455 mg/L), and MW-10D (0.374 mg/L). The elevated levels of iron and manganese appear to 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 resulting in higher concentrations. Aluminum, chromium, and silver concentrations have been well below WQCC standards for each monitoring well during more than seven years of monitoring. Cadmium concentrations have been well below WQCC standards for each monitoring well during more than four years of monitoring. Based on the results of the metal analyses during the annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals.

During the 2002 annual sampling event, arsenic concentrations were below WQCC standards (0.1 mg/L) and below the laboratory detection limit (0.05 mg/L) for all monitoring wells with the exception of MW-1 (0.616 mg/L). Other than natural conditions, there is no known source that explains the occurrence of arsenic in MW-1.

Barium concentrations have been well below WQCC standard of 1.0 mg/L for each monitoring well during more than seven years of monitoring with the exception of a marginal amount in MW-4 (1.03 mg/L) and MW-6 (1.55 mg/L) during the 2002 annual sampling event. Recent barium concentrations in upgradient well MW-7 (0.517 mg/L) and downgradient well MW-3 (0.299 mg/L) indicate background levels of barium are relatively high compared to the WQCC standard. Other than natural conditions, there is no known source that explains the occurrence of barium in MW-4 and MW-6.

Analyses of chlorides during the annual 2002 sampling event indicate the WQCC standard of 250 mg/L was not exceeded with the exception of MW-4 (820 mg/L), MW-5 (260 mg/L), MW-6 (584 mg/L), and MW-12 (276 mg/L). The TDS concentrations in MW-1 (1,251 mg/L), MW-4 (1,944 mg/L), MW-5 (1,330 mg/L), MW-6 (1,312 mg/L), MW-10 (1,140 mg/L), MW-10D (1,127 mg/L), MW-12 (1,488 mg/L), and MW-13 (1,098 mg/L) were slightly above the WQCC standards of 1,000 mg/L. The elevated chloride and TDS levels observed in the afore-mentioned monitoring wells do not represent a significant risk to human health or the environment. Chloride and TDS concentrations in the remaining monitoring wells were below the WQCC standards.

Since the groundwater on site is not used for potable drinking water, nor will it be in the foreseeable future, and the constituents of concern above WQCC standards are limited to being on site, there is low risk to human health and the environment.

Table 4
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-1	05/17/95	<0.01	**62.67**	**0.2**	0.8	**0.02**	**0.46**	**30.76**	**0.56**	188	**2,204**
	08/24/99	<0.01	<0.2	0.08	<0.05	<0.01	0.01	<0.05	**0.22**	110	**2,400**
	08/18/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	160	**2,700**
	08/02/02	<0.0125	0.286	**0.197**	<0.1	<0.025	<0.01	<0.05	0.194	80.6	**1,120**
	09/25/02	<0.0125	<0.100	**0.616**	0.258	<0.005	<0.01	<0.05	0.164	80	**1,251**
MW-2	05/17/95	**0.77**	0.16	<0.1	0.41	<0.01	0.02	0.34	**0.41**	6	378
	08/24/99	<0.01	1.0	<0.05	0.13	**0.01**	0.01	0.73	0.03	31	290
	08/17/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	11	300
	08/02/01	<0.0125	0.262	<0.05	0.169	<0.025	<0.01	<0.05	<0.025	45.7	412
	09/25/02	<0.0125	0.158	<0.05	0.910	<0.005	<0.01	0.090	<0.025	68	398
MW-3	05/17/95	**0.23**	**13.48**	<0.1	0.24	<0.01	0.04	**8.65**	**0.24**	13	328
	08/24/99	<0.01	0.35	<0.05	0.09	<0.01	<0.01	0.22	<0.01	16	280
	08/17/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	<0.05	<0.01	11	300
	08/02/01	<0.0125	0.265	<0.05	0.472	<0.025	<0.01	<0.05	<0.025	13.1	312
	09/25/02	<0.0125	<0.100	<0.05	0.299	<0.005	<0.01	<0.05	<0.025	24	235
MW-4	05/17/95	<0.01	2.44	**0.2**	0.69	<0.01	<0.01	**12.33**	0.15	**934**	**2,211**
	09/25/02	<0.0125	<0.100	0.083	**1.03**	<0.005	<0.01	**12.6**	0.132	**820**	**1,944**
MW-5	05/17/95	<0.01	**5.65**	**0.1**	**4.1**	<0.01	<0.01	**8.34**	**0.49**	**254**	937
	08/24/99	<0.01	<0.2	<0.05	**2.5**	<0.01	<0.01	**6.4**	**0.53**	**320**	**1,300**
	08/18/00	<0.01	<0.2	0.05	0.17	<0.01	<0.01	<0.05	**0.77**	240	**1,600**
	08/03/01	<0.0125	0.317	0.074	0.196	<0.025	<0.01	**16.8**	**1.11**	**250**	**2,200**
	09/26/02	<0.0125	<0.100	0.057	0.884	<0.005	<0.01	**7.30**	**0.55**	**260**	**1,330**
MW-6	05/17/95	<0.01	**11.43**	**0.2**	**1.25**	<0.01	<0.01	**19.66**	**0.25**	181	**1,001**
	09/25/02	<0.0125	0.148	0.090	**1.55**	<0.005	<0.01	**7.13**	0.075	**584**	**1,312**
MW-7	05/17/95	<0.01	**38.16**	**0.1**	0.45	**0.01**	**0.07**	**18.28**	**0.22**	113	713
	08/24/99	<0.01	<0.2	<0.05	0.87	<0.01	<0.01	0.06	<0.01	97	650
	08/17/00	<0.01	<0.2	<0.05	0.07	<0.01	<0.01	<0.05	<0.01	98	630
	08/02/01	<0.0125	0.259	<0.05	<0.1	<0.025	<0.01	<0.05	<0.025	94.5	646
	09/26/02	<0.0125	<0.100	<0.05	0.517	<0.005	<0.01	<0.05	<0.025	112	684
MW-8	05/17/95	<0.01	0.21	**0.2**	0.11	<0.01	<0.01	0.17	0.07	83	**1,366**
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	0.05	<0.01	25	350
	08/18/00	<0.01	<0.2	<0.05	0.19	<0.01	<0.01	<0.05	<0.01	9.4	290
	08/02/01	<0.0125	0.279	<0.05	0.153	<0.025	<0.01	<0.05	<0.025	21.5	400
	09/25/02	<0.0125	<0.100	<0.05	0.181	<0.005	<0.01	<0.05	<0.025	56	416
MW-9	05/17/95	<0.01	**26.58**	<0.1	0.3	<0.01	**0.06**	**12.08**	0.15	73	602
	04/24/96	<0.01	<0.2	---	---	---	<0.05	<0.03	<0.01	58	579
	08/15/97	<0.01	0.5	---	---	---	<0.05	0.91	<0.01	53	**1,600**
	07/22/98	<0.002	<0.01	---	---	---	<0.01	0.07	<0.01	53	580
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	<0.05	<0.01	52	580
	08/18/00	<0.01	<0.2	<0.05	0.14	<0.01	<0.01	<0.05	0.02	57	600
	08/02/01	<0.0125	0.745	<0.05	0.473	<0.025	<0.01	0.197	<0.025	52.9	616
	09/25/02	<0.0125	<0.100	<0.05	0.746	<0.005	<0.01	<0.05	0.040	84	615
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
--- Indicates sample was not analyzed for this constituent.

Table 4 (continued)
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-10	05/17/95	<0.01	4.79	<0.1	0.18	<0.01	<0.01	**3.05**	**0.41**	98	903
	04/24/96	0.01	<0.2	---	---	---	<0.01	0.26	**0.93**	72	909
	08/15/97	<0.01	<0.2	---	---	---	<0.01	0.61	**0.63**	120	**1,300**
	07/22/98	<0.002	<0.3	---	---	---	<0.002	**3.1**	**0.77**	67	820
	08/25/99	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	0.62	**0.69**	120	**1,200**
	08/18/00	<0.01	<0.2	<0.05	0.17	<0.01	<0.01	<0.05	**0.58**	100	**1,100**
	08/03/01	<0.0125	0.341	<0.05	0.507	<0.025	<0.01	0.492	**0.482**	106	**1,190**
	09/26/02	<0.0125	<0.100	<0.05	0.300	<0.005	<0.01	0.870	**0.455**	112	**1,140**
MW-10D	05/17/95	<0.01	3.99	<0.1	0.17	**0.01**	0.02	**2.88**	**0.25**	59	707
	04/24/96	<0.01	<0.2	---	---	---	<0.05	0.22	0.17	72	861
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.39	**0.2**	78	910
	07/22/98	<0.002	<0.3	---	---	---	<0.01	0.6	0.15	82	690
	08/25/99	<0.01	0.2	<0.05	0.08	<0.01	<0.01	0.51	**0.28**	110	**1,000**
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	0.57	**0.38**	87	950
	08/03/01	<0.0125	0.26	<0.05	0.527	<0.025	<0.01	**1.19**	**0.477**	92.8	**1,180**
	09/25/02	<0.0125	<0.100	<0.05	0.171	<0.005	<0.01	**1.05**	**0.374**	120	**1,127**
MW-11	05/17/95	<0.01	2.14	<0.1	0.1	<0.01	0.05	**1.34**	0.15	49	890
	04/24/96	0.02	<0.2	---	---	---	<0.03	0.13	0.08	28	963
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.11	0.17	39	**1,200**
	07/22/98	<0.002	<0.3	---	---	---	<0.01	<0.05	0.09	31	**1,000**
	08/24/99	<0.01	<0.2	<0.05	0.08	<0.01	<0.01	<0.05	0.13	40	850
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	<0.05	0.16	44	830
	08/03/01	<0.0125	0.326	<0.05	0.514	<0.025	<0.01	<0.05	0.143	51.1	835
	09/26/02	<0.0125	<0.100	<0.05	0.227	<0.005	<0.01	<0.05	0.155	80	896
MW-12	05/17/95	<0.01	**5.35**	<0.1	0.13	<0.01	0.03	**2.8**	0.07	225	**1,128**
	04/24/96	<0.01	<0.2	---	---	---	<0.05	<0.03	<0.01	91	736
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.48	0.05	**320**	**1,600**
	07/22/98	<0.002	<0.3	---	---	---	<0.01	0.4	0.05	210	**1,100**
	08/24/99	<0.01	<0.2	<0.05	0.12	**0.03**	0.04	0.29	0.07	190	**1,300**
	08/18/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	0.31	0.03	130	990
	08/02/01	<0.0125	0.196	<0.05	0.481	<0.025	<0.01	<0.05	<0.025	118	996
	09/26/02	<0.0125	<0.100	<0.05	0.247	<0.005	<0.01	<0.05	0.038	**276**	**1,488**
MW-13	05/17/95	**0.18**	**14.08**	<0.1	0.59	<0.01	<0.01	**7.02**	0.11	137	629
	04/24/96	<0.01	<0.2	---	---	---	<0.05	<0.03	<0.01	96	667
	08/15/97	<0.01	<0.2	---	---	---	<0.05	0.24	0.01	190	930
	07/22/98	<0.002	0.36	---	---	---	<0.01	0.34	0.01	97	800
	08/24/99	<0.01	<0.2	0.06	0.22	**0.04**	0.04	0.08	0.05	140	930
	08/18/00	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	<0.05	0.05	230	960
	08/03/01	<0.0125	0.302	<0.05	0.442	<0.025	<0.01	0.078	0.14	**339**	**1,410**
	09/26/02	<0.0125	<0.100	<0.05	0.284	<0.005	<0.01	0.081	0.157	96	**1,098**
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
--- Indicates sample was not analyzed for this constituent.

6.0 Intrinsic Bioremediation Assessment

The following assessment for intrinsic bioremediation occurring on site is identical to last year's annual report and is being repeated because the same trends and conditions are present.

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 an 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 an electron acceptor, it is reduced (iron reduction) to ferrous iron (Fe^{2+}), and Fe^{2+} concentrations increase. In anaerobic systems where sulfate is an 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, the mass of benzene degraded per unit mass of electron acceptor utilized and metabolic byproduct produced was calculated 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	---	2.02	1.96
NO_3	Denitrification	Decreases	0.21*	---	2.26	0.47
Fe^{2+}	Ferric Iron Reduction	Increases	---	0.046	1.73	0.08
SO_4	Sulfate Reduction	Decreases	0.22*	---	101	22.32
					Total Biodegradation Capacity	24.84
					Highest benzene concentration observed on site	18.8
					Average benzene concentration observed on site	1.85

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

Field measurements of DO and groundwater samples of nitrate and sulfate (for laboratory analysis) have historically been recovered at the Linam Ranch Plant in order to monitor the changes in groundwater chemistry associated with biodegradation. Table 5 is a summary of the DO, nitrate, sulfate, total iron, ferrous iron, and manganese concentrations. Changes in dissolved oxygen, nitrate, and sulfate concentrations with time are depicted in Figures 5, 6, and 7, respectively.

Hydrocarbon-impacted wells (MW-4, MW-5, MW-6, MW-10, MW-10D, and MW-11) are compared against upgradient and downgradient wells 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. The general decline in dissolved oxygen levels on the east side of the plant appears to indicate oxygen utilization during biodegradation processes.

- Nitrate and sulfate concentrations fluctuate over time therefore no trend relationship is noted. However, the presence of these constituents as electron acceptors indicates their availability for use by microorganisms in the course of hydrocarbon degradation.

- Increased concentrations of metabolic byproducts iron and manganese in monitoring wells MW-4, MW-5, MW-6, MW-10, and MW-10D indicates iron and manganese reduction conditions that are the result of anaerobic biodegradation processes.

- The biodegradation capacity of electron acceptors and metabolic byproducts (24.84 mg/L) exceeds the highest benzene concentration (18.8 mg/L) observed on site. The biodegradation capacity of electron acceptors and metabolic byproducts far exceeds the average benzene concentration (1.85 mg/L) observed on site by a ratio of 13.4 to 1. This indicates that the biodegradation process will continue.

Table 5
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Total Iron (mg/L)	Ferrous Iron (Fe^{+2}) (mg/L)	Manganese (mg/L)
MW-1	05/17/95	0.51	<0.3	**1,039**	**30.76**	---	**0.56**
	08/25/99	1.90	**120**	**660**	<0.05	---	**0.22**
	02/22/00	3.37	**130**	570	---	---	---
	08/17/00	0.35	**150**	590	<0.05	---	<0.01
	02/07/01	0.24	**96**	400	---	---	---
	08/02/01	2.04	2.5	268	<0.05	---	0.194
	03/11/02	2.65	<1.00	234	---	---	---
	09/25/02	0.57	0.15	293	<0.05	0.05	0.164
MW-2	05/17/95	1.60	0.81	62	0.34	---	**0.41**
	08/24/99	5.90	2.6	18	0.73	---	0.03
	02/22/00	4.47	2.8	17	---	---	---
	08/17/00	1.06	0.53	17	<0.05	---	<0.01
	02/07/01	3.36	1.8	19	---	---	---
	08/02/01	4.37	2.1	15	<0.05	---	<0.025
	03/11/02	4.53	1.75	29.9	---	---	---
	09/25/02	3.75	1.19	49.2	0.09	0.35	<0.025
MW-3	05/17/95	4.88	3.71	126	8.65	---	**0.24**
	02/09/99	8.5	5.2	59	---	---	<0.01
	08/24/99	7.61	3.7	35	0.22	---	---
	02/22/00	8.08	4.0	33	---	---	---
	08/17/00	7.48	1.9	44	<0.05	---	<0.01
	02/07/01	6.78	2.8	44	---	---	---
	08/02/01	8.79	3.1	44	<0.05	---	<0.025
	03/11/02	8.64	3.21	63.2	---	---	---
	09/25/02	7.97	2.85	58.5	<0.05	0.18	<0.025
MW-4	05/17/95	---	<0.15	78	12.33	---	0.15
	03/12/02	2.09	<1.00	17.6	---	---	---
	09/25/02	1.56	3.94	21.9	12.6	**1.56**	0.132
MW-5	05/17/95	---	<0.15	67	8.34	---	**0.49**
	08/25/99	0.00	<1.0	84	6.4	---	**0.53**
	02/23/00	0.34	< 1.0	64	---	---	---
	08/18/00	0.10	<0.1	390	<0.05	---	<0.01
	02/08/01	0.02	<1.0	370	---	---	---
	08/03/01	2.61	<1.0	**805**	16.8	---	**1.11**
	03/12/02	2.61	<1.0	358	---	---	---
	09/26/02	0.18	<1.0	155	7.30	**9.86**	**0.55**
MW-6	05/17/95	---	<0.15	72	19.66	---	**0.25**
	09/25/02	1.93	0.96	8.16	7.13	**9.56**	0.075
MW-7	05/17/95	6.50	2.8	161	18.28	---	**0.22**
	08/24/99	6.70	5.5	120	0.06	---	<0.01
	02/22/00	7.39	6.0	96	---	---	---
	08/17/00	6.98	3.0	98	<0.05	---	<0.01
	02/07/01	9.82	5.2	94	---	---	---
	08/02/01	7.64	5.2	90	<0.05	---	<0.025
	03/11/02	7.92	5.33	108	---	---	---
	09/26/02	2.60	5.23	41.6	<0.05	0.10	<0.025
WQCC Standards		NA	10.0	600	1.0	1.0	0.2

--- indicates not analyzed for this constituent.
New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (Continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Total Iron (mg/L)	Ferrous Iron (Fe^{-2}) (mg/L)	Manganese (mg/L)
MW-8	05/17/95	1.60	**33.4**	**602**	0.17	---	0.07
	08/24/99	4.88	3.2	31	0.05	---	<0.01
	02/22/00	3.48	3.4	22	---	---	---
	08/18/00	5.13	13	16	<0.05	---	<0.01
	02/07/01	2.67	1.9	22	---	---	---
	08/02/01	4.70	2.3	27	<0.05	---	<0.025
	03/11/02	3.11	5.36	49.9	---	---	---
	09/25/02	5.31	4.54	49.3	<0.05	0.14	<0.025
MW-9	05/17/95	1.85	4.70	126	12.08	---	0.15
	11/14/95	2.82	---	---	---	---	---
	01/17/96	5.3	---	---	---	---	---
	04/24/96	2.0	0.2	60	<0.03	---	<0.01
	01/22/97	14.6	3.4	71	---	---	---
	08/15/97	3.8	3.4	82	0.91	---	<0.01
	01/22/98	5.2	4.1	160	---	---	---
	07/20/98	2.38	5.4	72	0.07	---	<0.01
	02/09/99	3.1	5.4	78	---	---	---
	08/24/99	3.16	4.5	76	<0.05	---	<0.01
	02/22/00	0.28	4.5	75	---	---	---
	08/18/00	0.60	1.3	81	<0.05	---	0
	02/07/01	0.48	2.5	77	---	---	---
	08/02/01	1.61	2.3	75	0.197	---	<0.025
	03/11/02	2.58	2.05	91.1	---	---	---
	09/25/02	2.54	1.69	31.9	<0.05	0.11	0.0
MW-10	05/17/95	1.05	1.030	184	**3.05**	---	**0.41**
	11/14/95	1.98	<0.01	174	---	---	---
	01/17/96	5.0	<0.5	40	---	---	---
	04/24/96	1.6	<0.1	16	0.26	---	0.93
	01/22/97	8.75	<0.1	25	---	---	---
	08/15/97	2.9	< 1.0	210	0.61	---	0.63
	01/22/98	4.5	0.22	52	---	---	---
	07/22/98	1.13	3.50	40	**3.1**	---	**0.8**
	02/09/99	1.6	<1.0	68	---	---	---
	08/25/99	0.00	<1.0	200	0.62	---	0.69
	02/23/00	0.47	< 1.0	180	---	---	---
	08/18/00	1.13	<0.1	200	<0.05	---	1
	02/08/01	0.00	<1.0	220	---	---	---
	08/03/01	2.34	<1.0	206	0.492	---	0.482
	03/12/02	2.38	<1.0	195	---	---	---
	09/26/02	0.10	0.91	133	0.87	0.90	0.46
MW-10D	05/17/95	0.45	0.63	232	**2.88**	---	**0.25**
	11/14/95	2.41	---	---	---	---	---
	01/17/96	5.0	---	---	---	---	---
	04/24/96	1.8	<0.1	21	0.22	---	0.17
	01/22/97	5.5	<0.1	210	---	---	---
	08/15/97	1.8	< 1.0	180	0.39	---	0.20
	01/22/98	5.7	1.30	230	---	---	---
	07/22/98	1.49	4.0	140	0.60	---	0.15
	02/09/99	1.9	< 1.0	200	---	---	---
	08/25/99	1.54	2.4	220	0.51	---	0.28
	02/23/00	3.03	2.7	220	---	---	---
	08/18/00	0.50	<0.1	250	0.57	---	0.38
	02/07/01	0.06	<1.0	260	---	---	---
	08/03/01	1.88	<1.0	300	**1.19**	---	**0.48**
	03/12/02	2.46	<1.0	283	---	---	---
	09/25/02	0.36	0.64	253	**1.05**	**1.05**	**0.37**

--- indicates not analyzed for this constituent.
New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (Continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Total Iron (mg/L)	Ferrous Iron (Fe^{+2}) (mg/L)	Manganese (mg/L)
MW-11	05/17/95	1.05	**28.6**	190	**1.34**	---	**0.15**
	11/14/95	2.30	1.56	184	---	---	---
	01/17/96	2.8	**43.3**	150	---	---	---
	04/24/96	2.0	1.9	124	0.13	---	0.08
	01/22/97	7.0	**24**	170	---	---	---
	08/15/97	1.8	**40**	160	0.11	---	0.17
	01/22/98	4.3	**58**	150	---	---	---
	07/22/98	1.06	**19**	200	<0.05	---	0.09
	02/09/99	1.4	**12**	150	---	---	---
	08/24/99	0.09	8.0	120	<0.05	---	0.13
	02/23/00	0.58	7.0	120	---	---	---
	08/18/00	0.00	3.1	120	<0.05	---	0.16
	02/07/01	0.07	4.0	100	---	---	---
	08/03/01	2.46	4.1	96	<0.05	---	0.14
	03/12/02	2.43	3.69	104	---	---	---
	09/26/02	0.30	3.33	47.9	<0.05	0.10	0.16
MW-12	05/17/95	0.97	1.01	206	**2.80**	---	**0.07**
	11/14/95	3.15	---	---	---	---	---
	01/17/96	1.7	---	---	---	---	---
	04/24/96	1.8	<0.1	53	<0.03	---	<0.01
	01/22/97	11.8	<0.1	150	---	---	---
	08/15/97	1.9	< 1.0	210	0.48	---	0.05
	01/22/98	4.2	0.41	150	---	---	---
	07/22/98	2.52	0.71	130	0.40	---	0.05
	02/09/99	3.7	3.8	98	---	---	---
	08/24/99	0.14	<1.0	200	0.29	---	0.07
	02/22/00	0.81	3.10	73	---	---	---
	08/18/00	0.26	<0.1	120	0.31	---	0.03
	02/07/01	0.22	1.6	120	---	---	---
	08/02/01	2.23	2.2	116	<0.05	---	<0.025
	03/12/02	2.98	4.39	211	---	---	---
	09/26/02	0.72	3.14	107	<0.05	0.07	0.04
MW-13	05/17/95	1.51	5.00	99	**7.02**	---	**0.11**
	11/14/95	5.00	0.02	44	---	---	---
	01/17/96	2.0	6.54	42	---	---	---
	04/24/96	2.6	0.2	46	<0.03	---	<0.01
	01/22/97	9.5	5.4	65	---	---	---
	08/15/97	5.1	4.5	78	0.24	---	0.01
	01/22/98	7.4	7.3	88	---	---	---
	07/20/98	3.62	**12**	74	0.34	---	0.01
	02/09/99	2.7	**16**	79	---	---	---
	08/24/99	0.30	**16**	83	0.08	---	0.05
	02/23/00	0.59	9.1	86	---	---	---
	08/18/00	0.31	3.2	100	<0.05	---	0.05
	02/07/01	0.17	4.3	100	---	---	---
	08/03/01	2.63	1.3	126	0.078	---	0.140
	03/12/02	2.49	2.61	146	---	---	---
	09/26/02	0.40	3.09	171	0.081	0.18	0.157
WQCC Standards		NA	10.0	600	1.0	1.0	0.2

--- indicates not analyzed for this constituent.
New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

FIGURE 5A
Dissolved Oxygen Concentrations Versus Time
(WEST SIDE OF PLANT)

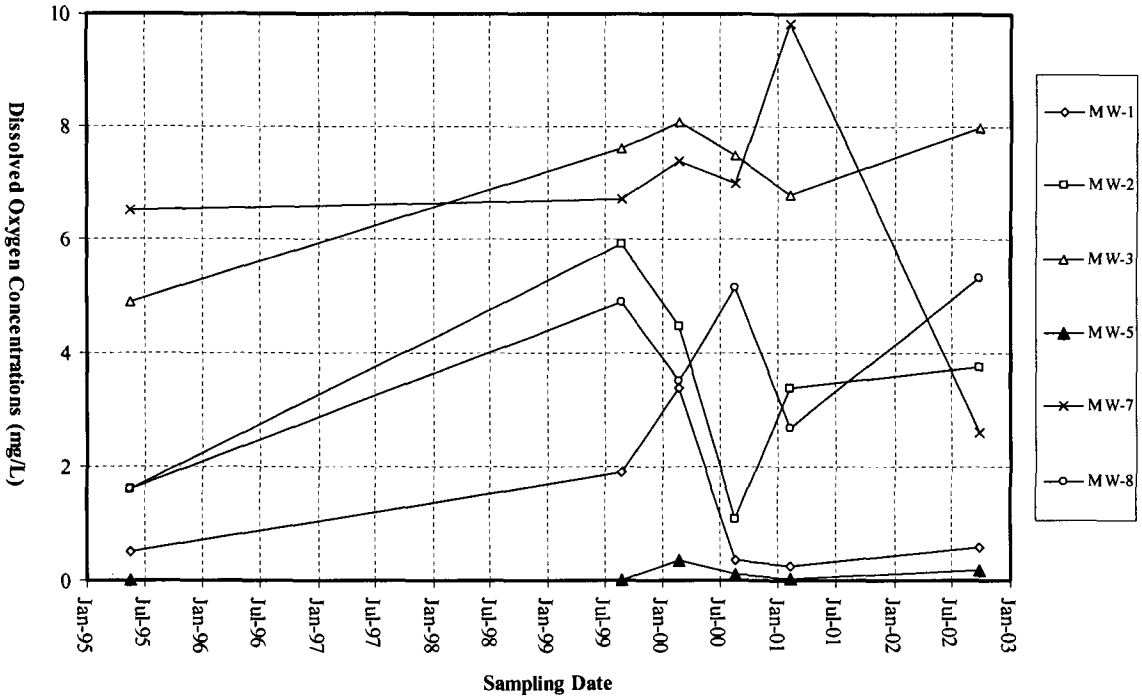


FIGURE 5B
Dissolved Oxygen Concentrations Versus Time
(EAST SIDE OF PLANT)

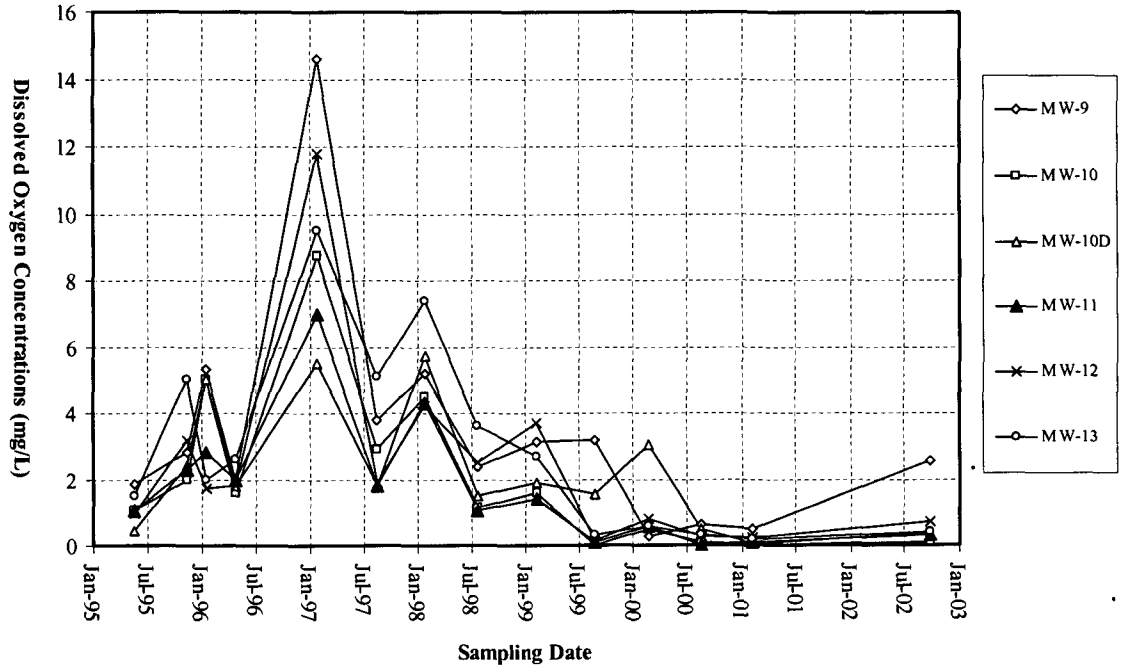


FIGURE 6A
Nitrate Concentrations Versus Time
(WEST SIDE OF PLANT)

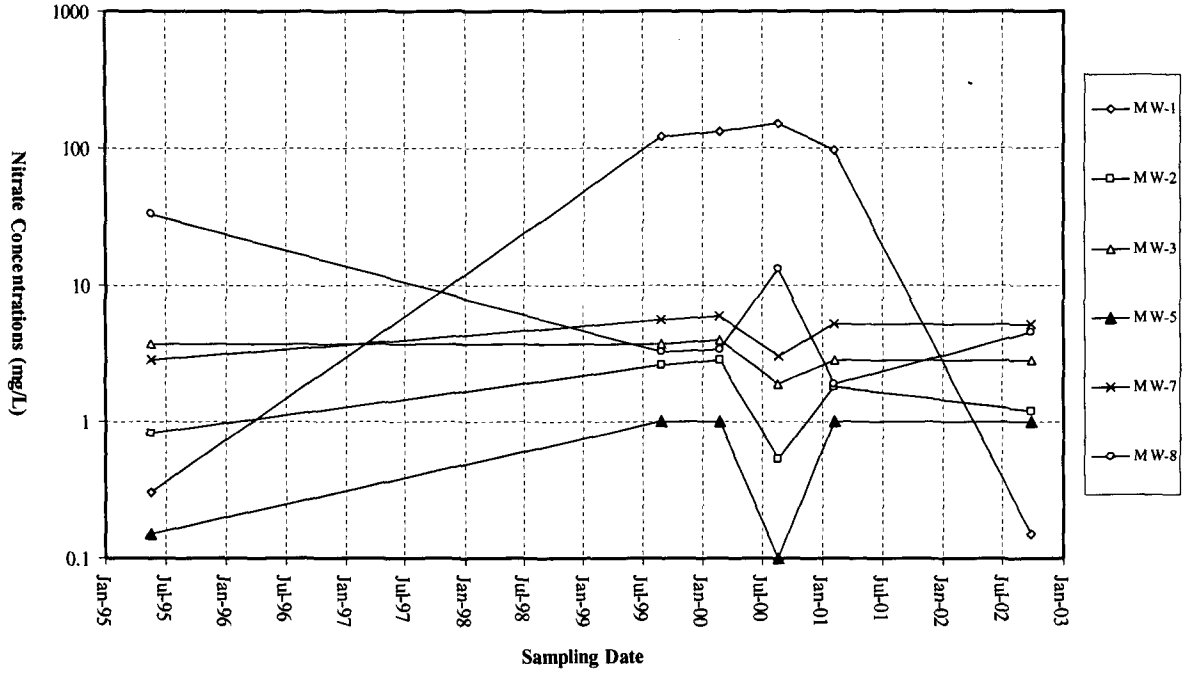


FIGURE 6B
Nitrate Concentrations Versus Time
(EAST SIDE OF PLANT)

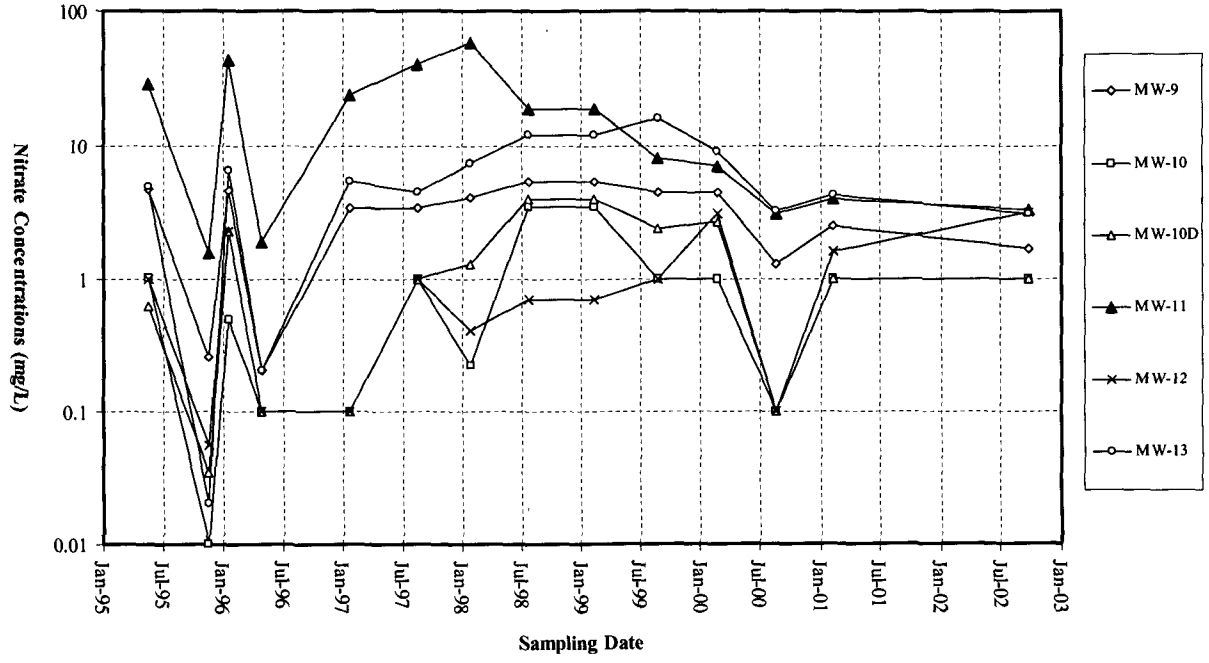


FIGURE 7A
Sulfate Concentrations Versus Time
(WEST SIDE OF PLANT)

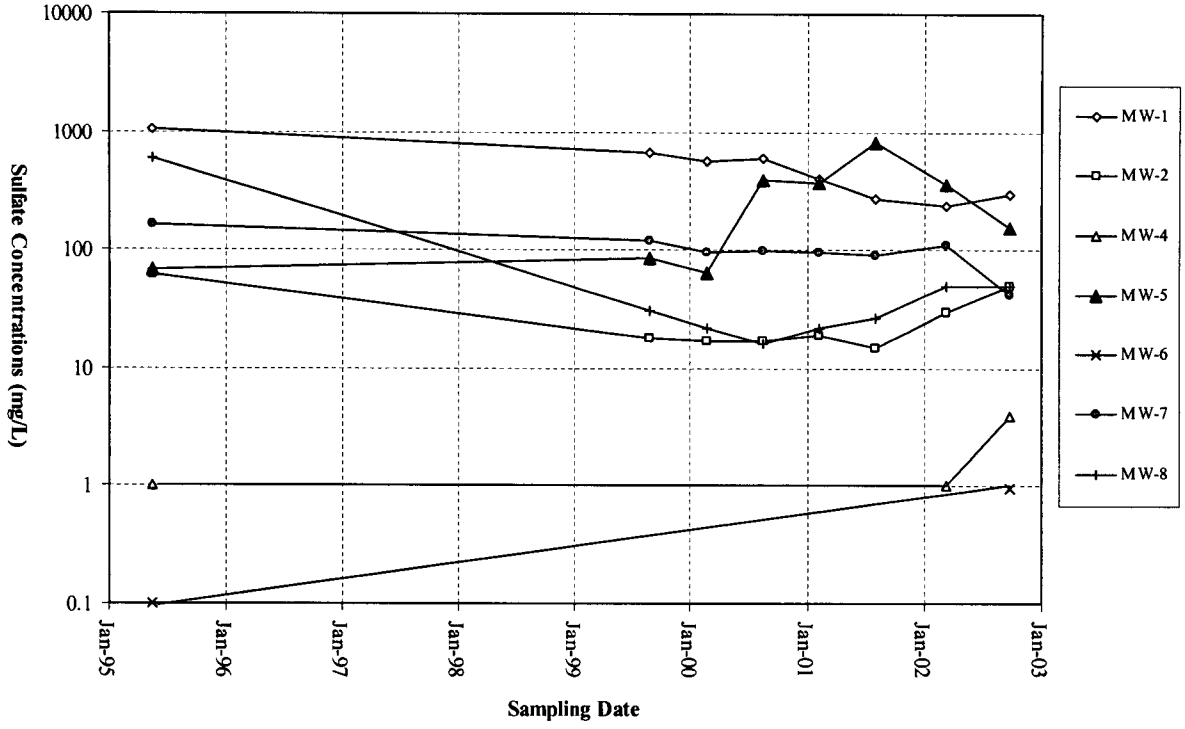
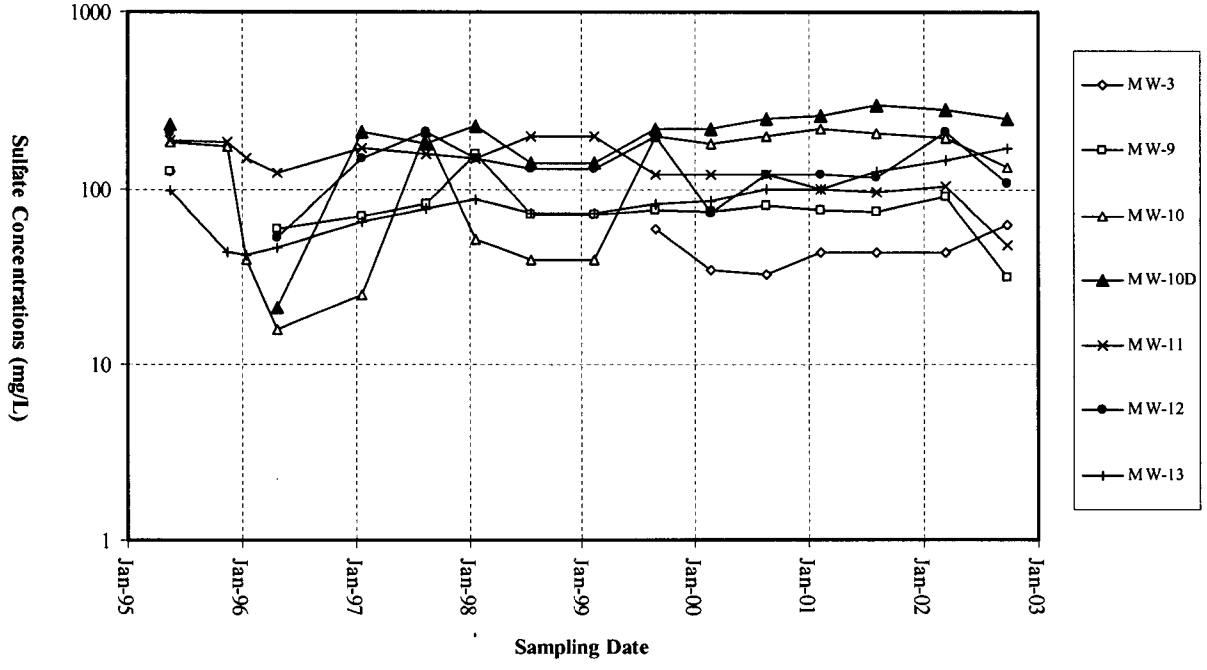


FIGURE 7B
Sulfate Concentrations Versus Time
(EAST SIDE OF PLANT)



7.0 Free Product Recovery

Hydrophobic adsorbent socks were used in monitoring wells MW-4 and MW-6 to recover free product from the groundwater beneath the former oil/water separator system at Linam Ranch Plant. As of December 17, 2002, the product recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 16.78 gallons of free product from MW-4 and MW-6. Product thickness and recovery volumes are listed on Table 6. Figures 8A and 8B graphically depict the produce thickness and cumulative recovery versus time for MW-4 and MW-6, respectively.

Table 6
LNAPL Recovery Volumes
Linam Ranch Plant

Date	LNAPL Thickness (feet)		LNAPL Recovered (gallons)		Cumulative Product LNAPL (gallons)
	MW-4	MW-6	MW-4	MW-6	
10/09/01	0.01	0.04	0.02	0.15	14.16
11/08/01	<0.01	0.09	0.00	0.11	14.28
12/10/01	0.01	0.01	0.04	0.09	14.41
01/14/02	0.10	0.01	0.02	0.30	14.73
02/17/02	<0.01	<0.01	0.04	0.08	14.85
03/11/02	<0.01	0.01	0.00	0.04	14.89
04/09/02	<0.01	0.04	0.05	0.18	15.13
05/14/02	0.01	0.01	0.13	0.09	15.34
06/18/02	<0.01	0.02	0.12	0.12	15.59
07/11/02	<0.01	0.01	0.10	0.06	15.75
08/14/02	0.01	0.01	0.11	0.30	16.15
09/25/02	<0.01	0.05	0.11	0.18	16.45
10/24/02	0.01	0.01	0.12	0.02	16.58
11/22/02	<0.01	<0.01	0.03	0.02	16.62
12/17/02	<0.01	<0.01	0.06	0.10	16.78
Total Volume of LNAPL Recovered On Site:					**16.78**

LNAPL recovery methods used:
MW-4: Hydrophobic (oil adsorbent) sock (passive bailer replaced with sock on 08-18-00).
MW-6: Hydrophobic (oil adsorbent) sock (passive bailer replaced with sock on 09-17-98).

FIGURE 8A
LNAPL Thickness and Recovery Versus Time (MW-4)

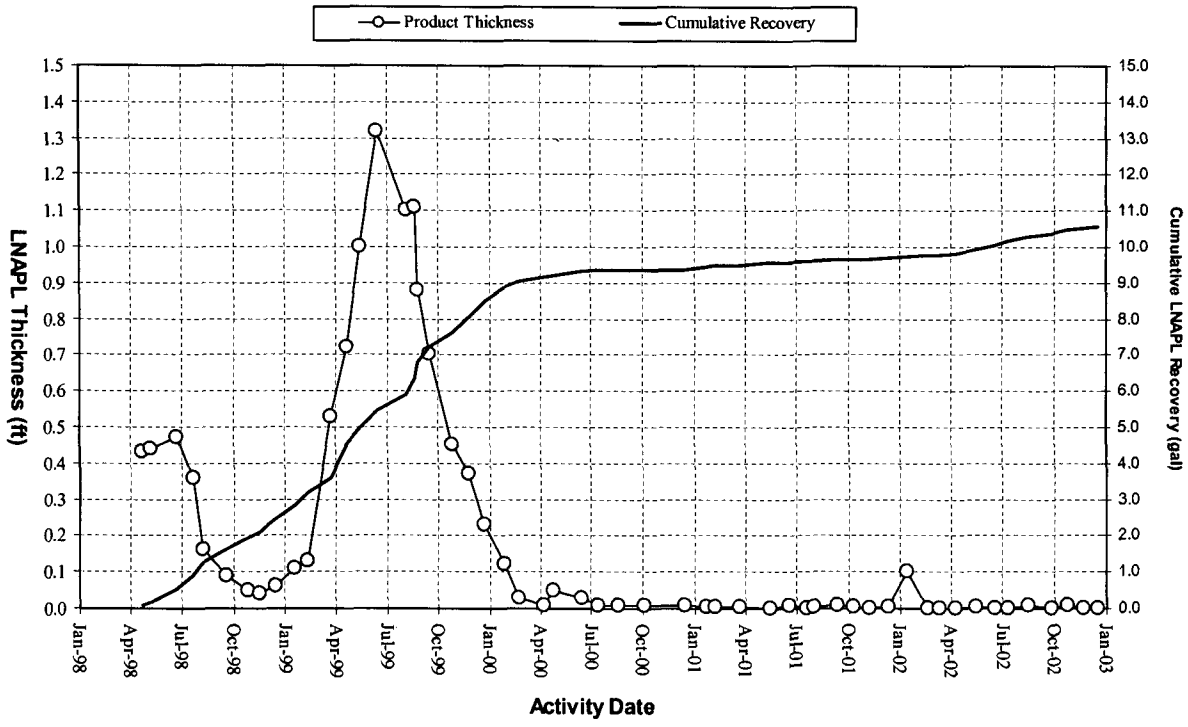
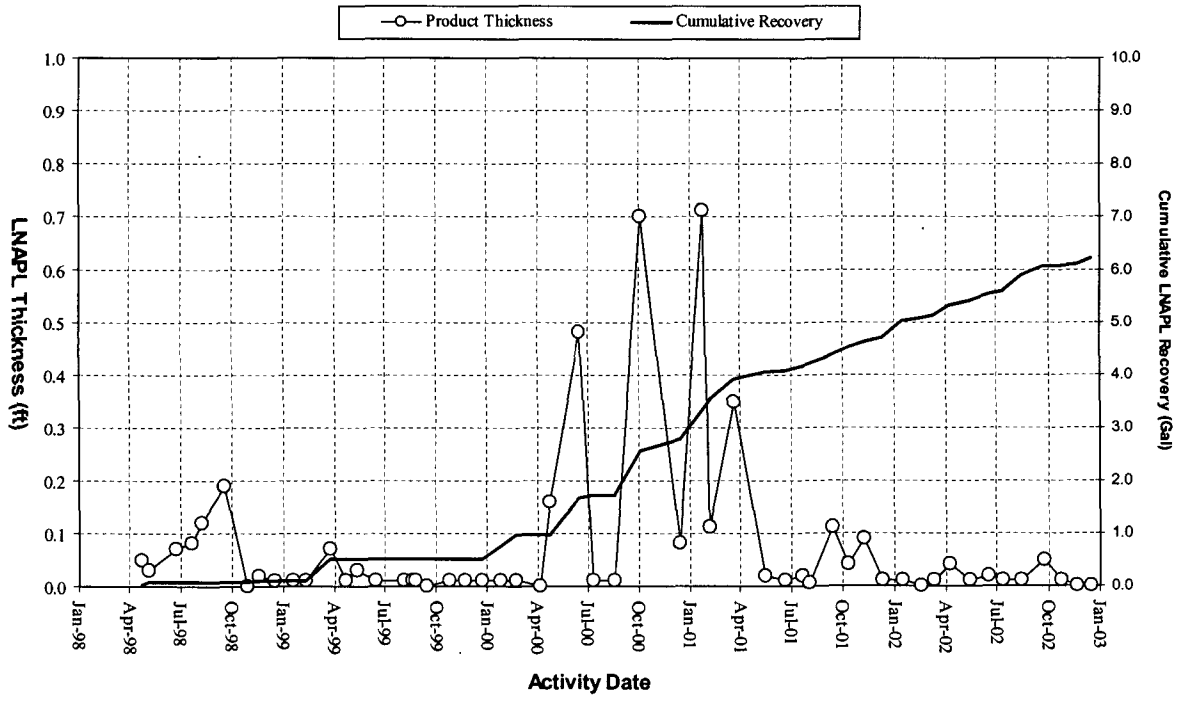


FIGURE 8B
LNAPL Thickness and Recovery Versus Time (MW-6)



8.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Linam Ranch Plant are presented below.

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-1, MW-2, MW-3, MW-7, MW-8, MW-10D, MW-11, MW-12 and MW-13 were below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.

- Benzene levels in MW-4 (18.8 mg/L), MW-5 (0.381 mg/L), MW-6 (1.29 mg/L), MW-9 (0.071 mg/L) and MW-10 (3.48 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (liquid waste disposal area) and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of December 12, 2002, the light non-aqueous phase liquids (LNAPL) recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 16.8 gallons of LNAPL (condensate) from monitoring wells MW-4 and MW-6. The measured thickness of LNAPL in MW-4 has remained at or below 0.01 feet since February 17, 2002, while the LNAPL thickness in MW-6 has been measured at or below 0.01 feet since October 24, 2002. The minimal LNAPL thickness in these two wells have allowed groundwater samples to be collected during 2002.

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

9.0 Recommendations

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2003.
- Discontinue analyses for aluminum, cadmium, chromium, and silver since these constituents have been below WQCC standards for over four years (over seven years in most cases).
- Continue LNAPL removal from MW-4 and MW-6 using absorbent socks or passive bailers with monthly inspections. Obtain groundwater samples from these two wells if the LNAPL thickness is less than 0.01 feet.

APPENDIX B

MONITORING WELL

SAMPLING DATA SHEETS

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-1**

SITE NAME: Linam Ranch Gas Plant

DATE: 3/11/03

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.15 Feet
DEPTH TO WATER: 46.14 Feet
HEIGHT OF WATER COLUMN: 7.01 Feet
WELL DIAMETER: 2.0 Inch

3.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:48	0	-	-	-	-	-	Pump On
10:51	3	19.1	1710	7.05	2.69	-	Salinity = 0.08%
10:53	6	19.00	1610	7.11	2.61	-	Salinity = 0.07%
10:56	9	18.9	1570	7.17	2.65	-	Salinity = 0.07%
							Pump Off
							Sample collected at 1100 MST
0:08	:Total Time (hr:min)		**9**	:Total Vol (gal)		**1.12**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO_3-N, and SO_4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/03
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 50.31 Feet
DEPTH TO WATER: 45.17 Feet
HEIGHT OF WATER COLUMN: 5.14 Feet
WELL DIAMETER: 2.0 Inch

2.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
11:32	0	-	-	-	-	-	Pump On
11:48	2	20.8	664	7.45	4.53	335	Salinity = 0.02%
							Pump Off (Well purged dry)
							Sample collected at 1200 MST
0:16	:Total Time (hr:min)		**2**	:Total Vol (gal)		**0.12**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/03
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.12 Feet
DEPTH TO WATER: 48.56 Feet
HEIGHT OF WATER COLUMN: 6.56 Feet
WELL DIAMETER: 2.0 Inch

3.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
14:01	0	-	-	-	-	-	Pump On
14:06	3	19.3	447	8.12	8.37	49	Salinity = 0.01%
14:11	6	18.9	469	8.01	8.53	-	Salinity = 0.01%
14:17	9	18.9	471	7.90	8.60	-	Salinity = 0.01%
14:22	12	18.9	473	7.95	8.56	-	Salinity = 0.01%
14:29	15	18.9	473	7.94	8.64	-	Salinity = 0.01%
							Pump off
							Sample collected at 1430 MST
0:28	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.53**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-4**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/12/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 48.39 Feet
HEIGHT OF WATER COLUMN: 7.61 Feet
WELL DIAMETER: 2.0 Inch

3.7 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
12:19	0	-	-	-	-	-	Pump On
12:21	4	22.1	3950	6.91	2.45	87	Salinity = 0.20%
12:24	8	21.7	4070	6.91	2.20	210	Salinity = 0.20%
12:31	12	22.5	3960	6.96	2.75	346	Salinity = 0.20%
12:34	16	22.6	3910	6.93	2.14	140	Salinity = 0.20%
12:39	20	23.1	3960	6.92	2.02	226	Salinity = 0.20%
12:45	24	23.9	3840	6.93	2.08	69	Salinity = 0.19%
12:45	28	24.0	3900	6.93	2.09	71	Salinity = 0.19%
							Pump Off
							Sample collected at 1250 MST
0:26	:Total Time (hr:min)		**28**	:Total Vol (gal)		**1.07**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/12/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.16 Feet
DEPTH TO WATER: 48.53 Feet
HEIGHT OF WATER COLUMN: 6.63 Feet
WELL DIAMETER: 4.0 Inch

13.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
11:25	0	-	-	-	-	-	Pump On
11:28	4	23.6	1970	7.13	3.56	203	Salinity = 0.09%
11:30	8	23.1	2130	7.08	2.44	52	Salinity = 0.10%
11:32	12	23.2	2130	7.07	2.31	6	Salinity = 0.10%
11:34	16	23.2	2130	7.07	2.39	5	Salinity = 0.10%
11:36	20	23.2	2140	7.10	2.47	2	Salinity = 0.10%
11:38	24	23.1	2160	7.12	-	-	Salinity = 0.10%
11:40	28	23.2	2170	7.10	2.48	-	Salinity = 0.10%
11:42	32	23.2	2170	7.10	2.61	-	Salinity = 0.10%
							Pump Off
							Sample collected at 1145 MST
0:17	:Total Time (hr:min)		**32**	:Total Vol (gal)		**1.88**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/03
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.40 Feet
DEPTH TO WATER: 56.77 Feet
HEIGHT OF WATER COLUMN: 5.63 Feet
WELL DIAMETER: 2.0 Inch

2.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
13:00	0	-	-	-	-	-	Hand bailed
13:10	3	18.7	1040	7.53	7.92	-	Bailed dry
							Sample colleced at 1315 MST
0:10	:Total Time (hr:min)		**3**	:Total Vol (gal)		**0.30**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/11/03
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.11 Feet
DEPTH TO WATER: 44.67 Feet
HEIGHT OF WATER COLUMN: 13.44 Feet
WELL DIAMETER: 4.0 Inch

26.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
12:18	0	-	-	-	-	-	Pump On
12:21	4	18.9	717	7.34	3.25	-	Salinity = 0.03%
12:24	8	19.4	711	7.34	3.52	-	Salinity = 0.03%
12:26	12	19.8	712	7.29	3.65	-	Salinity = 0.03%
12:29	16	20.3	718	7.26	3.17	-	Salinity = 0.03%
12:33	20	20.3	724	7.25	3.11	-	Salinity = 0.03%
12:36	24	20.5	726	7.25	3.03	-	Salinity = 0.03%
12:40	28	20.5	730	7.29	3.05	-	Salinity = 0.03%
12:43	32	20.5	729	7.27	3.10	-	Salinity = 0.03%
12:46	35	20.4	731	7.28	3.11	-	Salinity = 0.03%
							Pump Off
							Sample colleced at 1250 MST
0:28	:Total Time (hr:min)		**35**	:Total Vol (gal)		**1.25**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-9**

SITE NAME: Linam Ranch Gas Plant

DATE: 2/20/00

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.90 Feet
DEPTH TO WATER: 51.86 Feet
HEIGHT OF WATER COLUMN: 7.04 Feet
WELL DIAMETER: 2.0 Inch

3.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
14.:55	0	-	-	-	-	-	Pump On
14:59	3	18.7	1020	7.31	2.64	-	Salinity = 0.04%
15:02	6	18.9	999	7.29	2.63	-	Salinity = 0.04%
15:05	9	18.9	999	7.27	2.42	-	Salinity = 0.04%
15:09	12	18.9	999	7.29	2.58	-	Salinity = 0.04%
							Pump Off
							Sample colleced at 1520 MST
0:10	:Total Time (hr:min)		**12**	:Total Vol (gal)		**1.20**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/12/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.97 Feet
DEPTH TO WATER: 51.80 Feet
HEIGHT OF WATER COLUMN: 13.17 Feet
WELL DIAMETER: 4.0 Inch

25.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
9:58	0	-	-	-	-	-	Pump On
10:00	4	20.2	1740	7.36	3.94	80	Salinity = 0.08%
10:02	8	20.3	1710	7.20	2.25	19	Salinity = 0.08%
10:04	12	20.5	1750	7.23	2.13	19	Salinity = 0.08%
10:06	16	20.6	1760	7.26	2.24	21	Salinity = 0.08%
10:08	20	20.6	1750	7.29	2.24	16	Salinity = 0.08%
10:10	24	20.6	1750	7.30	2.38	5	Salinity = 0.08%
							Pump Off
							Sample colleced at 1010 MST
0:12	:Total Time (hr:min)		**24**	:Total Vol (gal)		**2.00**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-10D**

SITE NAME: Linam Ranch Gas Plant

DATE: 3/12/02

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 78.44 Feet
DEPTH TO WATER: 52.70 Feet
HEIGHT OF WATER COLUMN: 25.74 Feet
WELL DIAMETER: 2.0 Inch

12.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:41	0	-	-	-	-	-	Pump On
10:45	3	19.6	1660	7.36	2.66	-	Salinity = 0.07%
10:48	6	19.5	1650	7.21	2.65	-	Salinity = 0.07%
10:52	9	19.5	1620	7.09	2.47	-	Salinity = 0.07%
10:55	12	19.5	1610	7.10	2.59	-	Salinity = 0.07%
10:59	15	19.5	1600	7.06	2.46	-	Salinity = 0.07%
							Pump off
							Sample colleced at 1110 MST
0:18	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.83**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/12/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.69 Feet
DEPTH TO WATER: 52.51 Feet
HEIGHT OF WATER COLUMN: 10.18 Feet
WELL DIAMETER: 4.0 Inch

19.9 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
8:38	0	-	-	-	-	-	Pump On
8:40	4	19.3	1300	6.91	3.40	22	Salinity = 0.05%
8:42	8	20.0	1300	6.87	2.45	8	Salinity = 0.05%
8:44	12	20.3	1300	6.86	2.44	4	Salinity = 0.05%
8:46	16	20.4	1300	6.88	2.43	15	Salinity = 0.05%
8:48	20	20.4	1300	6.87	2.44	4	Salinity = 0.05%
8:50	24	20.5	1290	6.87	2.43	7	Salinity = 0.05%
							Pump Off
							Sample colleced at 0900 MST
0:12	:Total Time (hr:min)		**24**	:Total Vol (gal)		**1.99**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-12**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/12/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 59.14 Feet
DEPTH TO WATER: 51.83 Feet
HEIGHT OF WATER COLUMN: 7.31 Feet
WELL DIAMETER: 4.0 Inch

14.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
7:53	0	-	-	-	-	-	Pump On
7:55	4	17.7	1410	6.72	4.56	31	Salinity = 0.06%
7:57	8	19.0	1500	6.74	4.08	8	Salinity = 0.06%
8:00	12	19.4	1520	6.76	3.61	0	Salinity = 0.07%
8:02	16	19.6	1540	6.75	3.38	0	Salinity = 0.07%
8:05	20	19.7	1550	6.75	3.20	1	Salinity = 0.07%
8:07	24	19.7	1560	6.78	3.07	-	Salinity = 0.07%
8:10	28	19.8	1560	6.77	2.98	8	Salinity = 0.07%
							Pump Off
							Sample colleced at 0820 MST
0:17	:Total Time (hr:min)		**28**	:Total Vol (gal)		**1.64**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 3/12/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.87 Feet
DEPTH TO WATER: 53.49 Feet
HEIGHT OF WATER COLUMN: 9.38 Feet
WELL DIAMETER: 4.0 Inch

18.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
9:14	0	-	-	-	-	-	Pump On
9:15	4	19.2	1450	7.08	4.84	132	Salinity = 0.06%
9:18	8	19.5	1510	6.99	2.69	236	Salinity = 0.07%
9:21	12	19.5	1730	6.98	2.44	103	Salinity = 0.08%
9:24	16	20.3	1680	6.99	2.37	71	Salinity = 0.07%
9:27	20	20.3	1690	6.99	2.40	23	Salinity = 0.07%
9:30	24	20.3	1700	7.01	2.49	68	Salinity = 0.07%
							Pump Off
							Sample collected at 0940 MST
0:16	:Total Time (hr:min)		**24**	:Total Vol (gal)		**1.49**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX (8021B), NO3-N, and SO4 analysis.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/25/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.15 Feet
DEPTH TO WATER: 45.75 Feet
HEIGHT OF WATER COLUMN: 7.40 Feet
WELL DIAMETER: 2.0 Inch

3.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:56	0	-	-	-	-	-	Pump On
11:00	2	21	2180	5.47	1.04	999	Salinity = 0.10%
11:04	4	19.80	1890	5.79	0.46	98	Salinity = 0.08%
11:10	6	19.6	1760	6.59	0.16	4	Salinity = 0.08%
11:14	8	19.6	1690	6.48	0.29	41	Salinity = 0.07%
11:18	10	19.6	1660	6.7	0.16	16	Salinity = 0.07%
11:25	12	19.5	1640	6.74	0.17	10	Salinity = 0.07%
11:32	14	19.7	1630	6.81	0.57	3	Salinity = 0.07% (Pump Off)
						0.05	mg/L Ferrous Iron (Fe^{-2})
11:30							Time of sample collection
0:36	:Total Time (hr:min)		**14**	:Total Vol (gal)		**0.39**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/25/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 50.31 Feet
DEPTH TO WATER: 44.98 Feet
HEIGHT OF WATER COLUMN: 5.33 Feet
WELL DIAMETER: 2.0 Inch

2.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
15:45	0	-	-	-	-	-	Hand bailed
15:55	3	21.2	704	6.33	3.75	349	Salinity = 0.03% (Bailed dry)
						0.35	mg/L Ferrous Iron (Fe^{-2})
16:00							Time of sample collection
							Sample collected at 1600 MST
0:15	:Total Time (hr:min)		**3**	:Total Vol (gal)		**0.20**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/25/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.12 Feet
DEPTH TO WATER: 48.67 Feet
HEIGHT OF WATER COLUMN: 6.45 Feet
WELL DIAMETER: 2.0 Inch

3.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
9:37	0	-	-	-	-	-	Pump On
9:44	2	20.5	404	7.2	6.69	178	Salinity = 0.01%
10:02	4	20.10	395	6.38	6.51	180	Salinity = 0.01%
10:05	6	19.8	406	6.63	7.1	11	Salinity = 0.01%
10:15	8	19.7	417	6.31	7.97	0	Salinity = 0.01% (Pump Off)
						0.18	mg/L Ferrous Iron (Fe^{-2})
10:20							Time of sample collection
0:43	:Total Time (hr:min)		**8**	:Total Vol (gal)		**0.19**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-4**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/25/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 56.00 Feet
DEPTH TO WATER: 47.33 Feet
HEIGHT OF WATER COLUMN: 8.67 Feet
WELL DIAMETER: 2.0 Inch

4.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
16:45	0	-	-	-	-	-	Hand bailed
17:00	15	-	-	-	1.56	-	
						3.58	mg/L Ferrous Iron (Fe^{-2})
						17:10	Time of sample collection
0:15	:Total Time (hr:min)		**15**	:Total Vol (gal)		**1.00**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

Did not take temp, cond., turb, or pH parameters due to high risk of damaging Horiba multiparameter instrument.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-5**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/26/02

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.16 Feet
DEPTH TO WATER: 48.61 Feet
HEIGHT OF WATER COLUMN: 6.55 Feet
WELL DIAMETER: 4.0 Inch

12.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
14:01	0	-	-	-	-	-	Pump On
14:05	5	25.5	1990	5.72	0.35	44	Salinity = 0.09%
14:08	10	25.3	2030	5.91	0.25	37	Salinity = 0.09%
14:12	15	25.2	2050	6.31	0.24	9	Salinity = 0.09%
14:15	20	25.1	2100	6.56	0.51	15	Salinity = 0.10%
14:19	25	25.2	2130	6.51	0.39	11	Salinity = 0.10%
14:22	30	25.2	2150	6.99	0.18	28	Salinity = 0.10% (Pump Off)
						9.86	mg/L Ferrous Iron (Fe^{-2})
						14:30	Time of sample collection
0:21	:Total Time (hr:min)		**30**	:Total Vol (gal)		**1.43**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-6**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/25/02

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.30 Feet
DEPTH TO WATER: 48.48 Feet
HEIGHT OF WATER COLUMN: 4.82 Feet
WELL DIAMETER: 4.0 Inch

9.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
16:40	0	-	-	-	-	-	Hand bailed
16:55	15	-	-	-	1.93	-	
						9.56	mg/L Ferrous Iron (Fe^{-2})
						17:00	Time of sample collection
0:15	:Total Time (hr:min)		**15**	:Total Vol (gal)		**1.00**	:Flow Rate (gal/min)

COMMENTS: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

Did not take temp, cond., turb, or pH parameters due to high risk of damaging Horiba multiparameter instrument.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-7**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/26/02

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.40 Feet
DEPTH TO WATER: 57.41 Feet
HEIGHT OF WATER COLUMN: 4.99 Feet
WELL DIAMETER: 2.0 Inch

2.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
8:15	0	-	-	-	2.60	-	Hand bailed
8:25	3	-	-	-	-	-	Bailed dry
						0.10	mg/L Ferrous Iron (Fe^{-2})
						8:30	Time of sample collection
0:10	:Total Time (hr:min)		**3**	:Total Vol (gal)		**0.30**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-8**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/25/02

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.11 Feet
DEPTH TO WATER: 44.59 Feet
HEIGHT OF WATER COLUMN: 13.52 Feet
WELL DIAMETER: 4.0 Inch

26.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
15:21	0	-	-	-	5.32	-	Pump On
15:23	5	21.3	647	5.68	6.30	56	Salinity = 0.02%
15:25	10	20.9	654	5.94	4.67	97	Salinity = 0.02%
15:29	15	20.9	661	6.29	4.30	26	Salinity = 0.02%
15:32	20	21.1	666	6.62	4.76	22	Salinity = 0.02%
15:35	25	21.0	666	6.31	5.43	10	Salinity = 0.02%
15:38	30	20.9	668	6.21	5.31	14	Salinity = 0.02%
15:40	34	-	-	-	-	-	Pump Off
						0.14	mg/L Ferrous Iron (Fe^{-2})
						15:40	Time of sample collection
0:19	:Total Time (hr:min)		**34**	:Total Vol (gal)		**1.79**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 2/20/00
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.90 Feet
DEPTH TO WATER: 51.87 Feet
HEIGHT OF WATER COLUMN: 7.03 Feet
WELL DIAMETER: 2.0 Inch

3.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
12:50	0	-	-	-	2.13	-	Hand bailed
13:00	5	20.5	1060.0	6.1	2.54	-	
						0.11	mg/L Ferrous Iron (Fe^{-2})
						13:05	Time of sample collection
0:10	:Total Time (hr:min)		**5**	:Total Vol (gal)		**0.50**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-10**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/26/02

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.97 Feet
DEPTH TO WATER: 51.77 Feet
HEIGHT OF WATER COLUMN: 13.20 Feet
WELL DIAMETER: 4.0 Inch

25.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
12:36	0	-	-	-	1.58	-	Pump On
12:40	5	23.7	1620	6.19	1.09	33	Salinity = 0.07%
12:43	10	23.9	1720	6.45	0.46	28	Salinity = 0.08%
12:47	15	23.2	1720	6.54	0.52	25	Salinity = 0.08%
12:50	20	22.7	1720	6.81	0.17	88	Salinity = 0.08%
12:53	25	22.8	1720	6.93	0.18	14	Salinity = 0.08%
12:56	30	22.7	1720	7.00	0.10	24	Salinity = 0.08% (Pump Off)
						0.90	mg/L Ferrous Iron (Fe^{-2})
						13:00	Time of sample collection
							Collected duplicate sample for
							BTEX analysis
0:20	:Total Time (hr:min)		**30**	:Total Vol (gal)		**1.50**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10D**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/25/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 78.44 Feet
DEPTH TO WATER: 52.73 Feet
HEIGHT OF WATER COLUMN: 25.71 Feet
WELL DIAMETER: 2.0 Inch

12.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
12:12	0	-	-	-	2.03	-	Pump On
12:22	2	22.1	1670	6.04	0.52	-	Salinity = 0.07%
12:28	4	21.1	1640	6.63	0.27	-	Salinity = 0.07%
12:32	6	21.0	1600	7.01	1.45	-	Salinity = 0.07%
12:43	8	20.9	1600	6.63	0.33	-	Salinity = 0.07%
12:51	10	20.7	1590	6.51	0.31	-	Salinity = 0.07%
12:57	12	20.7	1590	6.48	0.28	-	Salinity = 0.07%
12:59	14	20.8	1570	6.47	0.36	-	Salinity = 0.07% (Pump Off)
						1.05	mg/L Ferrous Iron (Fe^{-2})
						12:59	Time of sample collection
0:47	:Total Time (hr:min)		**14**	:Total Vol (gal)		**0.30**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-11**

SITE NAME: Linam Ranch Gas Plant

DATE: 9/25/02

PROJECT NO. V-102

SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.69 Feet
DEPTH TO WATER: 52.48 Feet
HEIGHT OF WATER COLUMN: 10.21 Feet
WELL DIAMETER: 4.0 Inch

20.0 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
11:49	0	-	-	-	1.90	-	Pump On
11:52	5	22.5	1320	5.52	0.25	10	Salinity = 0.06%
11:55	10	22.3	1340	5.38	0.30	19	Salinity = 0.06%
11:58	15	22.2	1350	5.57	0.22	53	Salinity = 0.06%
12:01	20	22.2	1340	5.87	0.28	22	Salinity = 0.06%
12:04	25	22.1	1330	5.95	0.33	48	Salinity = 0.06%
12:06	30	22.1	1330	6.05	0.30	28	Salinity = 0.06% (Pump Off)
						0.10	mg/L Ferrous Iron (Fe^{-2})
						12:10	Time of sample collection
0:17	:Total Time (hr:min)		**30**	:Total Vol (gal)		**1.76**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-12**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/26/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 59.14 Feet
DEPTH TO WATER: 51.75 Feet
HEIGHT OF WATER COLUMN: 7.39 Feet
WELL DIAMETER: 4.0 Inch

14.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:06	0	-	-	-	2.84	-	Pump On
10:10	5	20.9	1380	4.51	2.01	25	Salinity = 0.06%
10:14	10	21.2	1550	4.79	0.87	11	Salinity = 0.07%
10:17	15	21.4	1580	5.12	0.59	14	Salinity = 0.07%
10:22	20	21.8	1550	5.09	0.62	13	Salinity = 0.07%
10:25	25	21.8	1560	4.95	0.73	14	Salinity = 0.07%
10:29	30	21.9	1560	5.08	0.72	4	Salinity = 0.07% (Pump Off)
						0.07	mg/L Ferrous Iron (Fe^{-2})
						10:30	Time of sample collection
0:23	:Total Time (hr:min)		**30**	:Total Vol (gal)		**1.30**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 9/26/02
PROJECT NO. V-102
SAMPLER: Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.87 Feet
DEPTH TO WATER: 53.49 Feet
HEIGHT OF WATER COLUMN: 9.38 Feet
WELL DIAMETER: 4.0 Inch

18.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:57	0	-	-	-	2.08	-	Pump On
11:00	5	21.7	1440	5.09	1.38	10	Salinity = 0.06%
11:04	10	21.8	1660	5.57	0.47	19	Salinity = 0.07%
11:07	15	21.9	1730	5.65	0.30	53	Salinity = 0.08%
11:10	20	21.9	1760	5.57	0.24	22	Salinity = 0.08%
11:13	25	21.8	1760	5.57	1.77	48	Salinity = 0.08%
11:16	30	21.9	1760	5.67	0.40	28	Salinity = 0.08% (Pump Off)
						0.18	mg/L Ferrous Iron (Fe^{-2})
						11:20	Time of sample collection
0:19	:Total Time (hr:min)		**30**	:Total Vol (gal)		**1.57**	:Flow Rate (gal/min)

COMMENTS: Samples collected for BTEX, Cl, NO3, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe & Mn analysis

APPENDIX A

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: March 26, 2002

Order ID Number: A02031311

Project Number: CC # V-102
Project Name: Duke Energy Field Services
Project Location: Linam Ranch Plant

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192673	MW-1	Water	3/11/02	11:00	3/13/02
192674	MW-2	Water	3/11/02	12:00	3/13/02
192675	MW-8	Water	3/11/02	12:50	3/13/02
192676	MW-7	Water	3/11/02	13:15	3/13/02
192677	MW-3	Water	3/11/02	14:30	3/13/02
192678	MW-9	Water	3/11/02	15:20	3/13/02
192679	MW-12	Water	3/12/02	8:20	3/13/02
192680	MW-11	Water	3/12/02	9:00	3/13/02
192681	MW-13	Water	3/12/02	9:40	3/13/02
192682	MW-10	Water	3/12/02	10:10	3/13/02
192683	MW-10d	Water	3/12/02	11:10	3/13/02
192684	MW-5	Water	3/12/02	11:45	3/13/02
192685	MW-4	Water	3/12/02	12:50	3/13/02
192686	Rinsate	Water	3/12/02	12:00	3/13/02
192687	Duplicate	Water	3/11/02	:	3/13/02

0 This report consists of a total of 3 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
192673 - MW-1	<0.001	<0.001	<0.001	<0.001	<0.001
192674 - MW-2	<0.001	<0.001	<0.001	<0.001	<0.001
192675 - MW-8	<0.001	<0.001	<0.001	<0.001	<0.001
192676 - MW-7	<0.001	<0.001	<0.001	<0.001	<0.001
192677 - MW-3	<0.001	<0.001	<0.001	<0.001	<0.001
192678 - MW-9	0.0476	<0.001	<0.001	<0.001	0.0476
192679 - MW-12	<0.001	<0.001	<0.001	<0.001	<0.001
192680 - MW-11	0.0052	<0.001	<0.001	<0.001	0.0052
192681 - MW-13	<0.001	<0.001	<0.001	<0.001	<0.001
192682 - MW-10	3.26	0.178	0.251	0.550	4.239
192683 - MW-10d	0.002	<0.001	<0.001	<0.001	0.002
192684 - MW-5	0.0618	<0.001	0.0969	<0.001	0.1587
192685 - MW-4	17.9	<0.100	0.450	0.166	18.516
192686 - Rinsate	<0.001	<0.001	<0.001	<0.001	<0.001
192687 - Duplicate	18.3	<0.100	0.465	0.174	18.939

Sample: 192673 - MW-1

Param	Flag	Result	Units
Nitrate-N		<1.00	mg/L
Sulfate	1	234	mg/L

Sample: 192674 - MW-2

Param	Flag	Result	Units
Nitrate-N		1.75	mg/L
Sulfate		29.9	mg/L

Sample: 192675 - MW-8

Param	Flag	Result	Units
Nitrate-N		5.36	mg/L
Sulfate		49.9	mg/L

Sample: 192676 - MW-7

Param	Flag	Result	Units
Nitrate-N		5.33	mg/L
Sulfate		108	mg/L

Sample: 192677 - MW-3

Param	Flag	Result	Units
Nitrate-N		3.21	mg/L
Sulfate		63.2	mg/L

Sample: 192678 - MW-9

Param	Flag	Result	Units
Nitrate-N		2.05	mg/L
Sulfate		91.1	mg/L

Sample: 192679 - MW-12

Param	Flag	Result	Units
Nitrate-N		4.39	mg/L
Sulfate		211	mg/L

[1] Sulfate re-ran on IC031402-1.sch. ICV %IA = 101; CCV %IA = 101; matrix spikes RPD = 1, %EA = 99; LCS spikes RPD = 1, %EA = 100

Sample: 192680 - MW-11

Param	Flag	Result	Units
Nitrate-N		3.69	mg/L
Sulfate		104	mg/L

Sample: 192681 - MW-13

Param	Flag	Result	Units
Nitrate-N		2.61	mg/L
Sulfate		146	mg/L

Sample: 192682 - MW-10

Param	Flag	Result	Units
Nitrate-N		<1.00	mg/L
Sulfate		195	mg/L

Sample: 192683 - MW-10d

Param	Flag	Result	Units
Nitrate-N	2	<1.00	mg/L
Sulfate	3	283	mg/L

Sample: 192684 - MW-5

Param	Flag	Result	Units
Nitrate-N	4	<1.00	mg/L
Sulfate	5	358	mg/L

Sample: 192685 - MW-4

Param	Flag	Result	Units
Nitrate-N	6	<1.00	mg/L
Sulfate	7	17.6	mg/L

[2]Nitrate matrix spikes RPD = 1; %EA = 101

[3]Sulfate re-ran on IC031402-1.sch. ICV %IA = 101; CCV %IA = 101; matrix spikes RPD = 1, %EA = 99; LCS spikes RPD = 1, %EA = 100

[4]Nitrate matrix spikes RPD = 1; %EA = 101

[5]Sulfate re-ran on IC031402-1.sch. ICV %IA = 101; CCV %IA = 101; matrix spikes RPD = 1, %EA = 99; LCS spikes RPD = 1, %EA = 100

[6]Nitrate matrix spikes RPD = 1; %EA = 101

[7]Sulfte matrix spikes RPD = 1; %EA = 103

TRACEANALYSIS, INC.

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Analytical and Quality Control Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: March 26, 2002

Order ID Number: A02031311

Project Number: CC # V-102
Project Name: Duke Energy Field Services
Project Location: Linam Ranch Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192673	MW-1	Water	3/11/02	11:00	3/13/02
192674	MW-2	Water	3/11/02	12:00	3/13/02
192675	MW-8	Water	3/11/02	12:50	3/13/02
192676	MW-7	Water	3/11/02	13:15	3/13/02
192677	MW-3	Water	3/11/02	14:30	3/13/02
192678	MW-9	Water	3/11/02	15:20	3/13/02
192679	MW-12	Water	3/12/02	8:20	3/13/02
192680	MW-11	Water	3/12/02	9:00	3/13/02
192681	MW-13	Water	3/12/02	9:40	3/13/02
192682	MW-10	Water	3/12/02	10:10	3/13/02
192683	MW-10d	Water	3/12/02	11:10	3/13/02
192684	MW-5	Water	3/12/02	11:45	3/13/02
192685	MW-4	Water	3/12/02	12:50	3/13/02
192686	Rinsate	Water	3/12/02	12:00	3/13/02
192687	Duplicate	Water	3/11/02	:	3/13/02

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. Note: the RDL is equal to MQL for all organic analytes including TPH.

This report consists of a total of 15 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 192673 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0833	mg/L	1	0.10	83	70 - 130
4-BFB		0.072	mg/L	1	0.10	72	70 - 130

Sample: 192673 - MW-1

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18853	Date Analyzed:	3/13/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18260	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate	[1]	234	mg/L	10	0.50

Sample: 192674 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0881	mg/L	1	0.10	88	70 - 130
4-BFB		0.0809	mg/L	1	0.10	81	70 - 130

Sample: 192674 - MW-2

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18853	Date Analyzed:	3/13/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18260	Date Prepared:	3/13/02

[1] Sulfate re-ran on IC031402-1.sch. ICV %IA = 101; CCV %IA = 101; matrix spikes RPD = 1, %EA = 99; LCS spikes RPD = 1, %EA = 100

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		1.75	mg/L	5	0.20
Sulfate		29.9	mg/L	5	0.50

Sample: 192675 - MW-8

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0938	mg/L	1	0.10	94	70 - 130
4-BFB		0.0827	mg/L	1	0.10	83	70 - 130

Sample: 192675 - MW-8

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18853 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		5.36	mg/L	5	0.20
Sulfate		49.9	mg/L	5	0.50

Sample: 192676 - MW-7

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0879	mg/L	1	0.10	88	70 - 130
4-BFB		0.0798	mg/L	1	0.10	80	70 - 130

Sample: 192676 - MW-7

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18853 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		5.33	mg/L	5	0.20
Sulfate		108	mg/L	5	0.50

Sample: 192677 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0868	mg/L	1	0.10	87	70 - 130
4-BFB		0.0765	mg/L	1	0.10	76	70 - 130

Sample: 192677 - MW-3

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18853	Date Analyzed:	3/13/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18260	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		3.21	mg/L	5	0.20
Sulfate		63.2	mg/L	5	0.50

Sample: 192678 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0476	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0476	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0899	mg/L	1	0.10	90	70 - 130
4-BFB		0.0802	mg/L	1	0.10	80	70 - 130

Sample: 192678 - MW-9

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18853	Date Analyzed:	3/13/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18260	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		2.05	mg/L	5	0.20
Sulfate		91.1	mg/L	5	0.50

Sample: 192679 - MW-12

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0885	mg/L	1	0.10	88	70 - 130
4-BFB		0.0794	mg/L	1	0.10	79	70 - 130

Sample: 192679 - MW-12

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18853 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		4.39	mg/L	5	0.20
Sulfate		211	mg/L	5	0.50

Sample: 192680 - MW-11

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0052	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0052	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0898	mg/L	1	0.10	90	70 - 130
4-BFB		0.0807	mg/L	1	0.10	81	70 - 130

Sample: 192680 - MW-11

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18853 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		3.69	mg/L	5	0.20
Sulfate		104	mg/L	5	0.50

Sample: 192681 - MW-13

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0813	mg/L	1	0.10	81	70 - 130
4-BFB		0.0735	mg/L	1	0.10	74	70 - 130

Sample: 192681 - MW-13

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18853 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		2.61	mg/L	5	0.20
Sulfate		146	mg/L	5	0.50

Sample: 192682 - MW-10

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18803 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18215 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		3.26	mg/L	20	0.001
Toluene		0.178	mg/L	20	0.001
Ethylbenzene		0.251	mg/L	20	0.001
M,P,O-Xylene		0.550	mg/L	20	0.001
Total BTEX		4.239	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.088	mg/L	20	0.10	88	70 - 130
4-BFB		0.079	mg/L	20	0.10	79	70 - 130

Sample: 192682 - MW-10

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18853 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.00	mg/L	5	0.20
Sulfate		195	mg/L	5	0.50

Sample: 192683 - MW-10d

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18803	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18215	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.002	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.002	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0877	mg/L	1	0.10	88	70 - 130
4-BFB		0.0798	mg/L	1	0.10	80	70 - 130

Sample: 192683 - MW-10d

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18854	Date Analyzed:	3/13/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18260	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[2]	<1.00	mg/L	5	0.20
Sulfate	[3]	283	mg/L	10	0.50

Sample: 192684 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18802	Date Analyzed:	3/13/02
Analyst:	BC	Preparation Method:	S 5030B	Prep Batch:	PB18214	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0618	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		0.0969	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.1587	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.109	mg/L	1	0.10	109	70 - 130
4-BFB		0.0934	mg/L	1	0.10	93	70 - 130

[2]Nitrate matrix spikes RPD = 1; %EA = 101

[3]Sulfate re-ran on IC031402-1.sch. ICV %IA = 101; CCV %IA = 101; matrix spikes RPD = 1, %EA = 99; LCS spikes RPD = 1, %EA = 100

Sample: 192684 - MW-5

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18854 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[4]	<1.00	mg/L	5	0.20
Sulfate	[5]	358	mg/L	10	0.50

Sample: 192685 - MW-4

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18861 Date Analyzed: 3/14/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB18263 Date Prepared: 3/14/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		17.9	mg/L	100	0.001
Toluene		<0.100	mg/L	100	0.001
Ethylbenzene		0.450	mg/L	100	0.001
M,P,O-Xylene		0.166	mg/L	100	0.001
Total BTEX		18.516	mg/L	100	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.091	mg/L	100	0.10	91	70 - 130
4-BFB	[6]	0.059	mg/L	100	0.10	59	70 - 130

Sample: 192685 - MW-4

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18854 Date Analyzed: 3/13/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18260 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[7]	<1.00	mg/L	5	0.20
Sulfate	[8]	17.6	mg/L	5	0.50

Sample: 192686 - Rinsate

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC18802 Date Analyzed: 3/13/02
Analyst: BC Preparation Method: S 5030B Prep Batch: PB18214 Date Prepared: 3/13/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

[4] Nitrate matrix spikes RPD = 1; %EA = 101
[5] Sulfate re-ran on IC031402-1.sch. ICV %IA = 101; CCV %IA = 101; matrix spikes RPD = 1, %EA = 99; LCS spikes RPD = 1, %EA = 100
[6] Low BFB surrogate recovery due to matrix interference. TFT surrogate recovery shows the method to be in control.
[7] Nitrate matrix spikes RPD = 1; %EA = 101
[8] Sulfte matrix spikes RPD = 1; %EA = 103

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0971	mg/L	1	0.10	97	70 - 130
4-BFB	[9]	0.0627	mg/L	1	0.10	62	70 - 130

Sample: 192687 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18861	Date Analyzed:	3/14/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18263	Date Prepared:	3/14/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		18.3	mg/L	100	0.001
Toluene		<0.100	mg/L	100	0.001
Ethylbenzene		0.465	mg/L	100	0.001
M,P,O-Xylene		0.174	mg/L	100	0.001
Total BTEX		18.939	mg/L	100	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.087	mg/L	100	0.10	87	70 - 130
4-BFB	[10]	0.062	mg/L	100	0.10	62	70 - 130

[9]Low BFB recovery due to matrix interference. TFT surrogate recovery shows the method to be in control.
[10]Low BFB surrogate recovery due to matrix interference. TFT surrogate recovery shows the method to be in control.

Quality Control Report
Method Blank

Method Blank QCBatch: QC18802

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0917	mg/L	1	0.10	92	70 - 130
4-BFB	[11]	0.056	mg/L	1	0.10	56	70 - 130

Method Blank QCBatch: QC18803

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.094	mg/L	1	0.10	94	70 - 130
4-BFB		0.0798	mg/L	1	0.10	80	70 - 130

Method Blank QCBatch: QC18853

Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC18854

Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20

Continued ...

[11] Low BFB surrogate recovery due to prep. TFT surrogate recovery shows the method to be in control.

... Continued

Param	Flag	Results	Units	Reporting Limit
Sulfate		<2.0	mg/L	0.50

Method Blank

QCBatch: QC18861

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0935	mg/L	1	0.10	94	70 - 130
4-BFB	[12]	0.0614	mg/L	1	0.10	61	70 - 130

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC18802

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0913	0.0928	mg/L	1	0.10	<0.001	91	2	82 - 111	7
Benzene	0.0972	0.0967	mg/L	1	0.10	<0.001	97	0	86 - 106	5
Toluene	0.0974	0.0971	mg/L	1	0.10	<0.001	97	0	82 - 108	4
Ethylbenzene	0.0975	0.0973	mg/L	1	0.10	<0.001	98	0	86 - 115	6
M,P,O-Xylene	0.297	0.298	mg/L	1	0.30	<0.001	99	0	79 - 122	29

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0949	0.0931	mg/L	1	0.10	95	93	70 - 130
4-BFB	0.0868	0.0862	mg/L	1	0.10	87	86	70 - 130

Laboratory Control Spikes

QCBatch: QC18803

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0806	0.0885	mg/L	1	0.10	<0.001	81	9	82 - 111	7
Benzene	0.0787	0.0882	mg/L	1	0.10	<0.001	79	11	86 - 106	5

Continued ...

[12]Low BFB surrogate recovery due to prep. TFT surrogate recovery shows the method to be in control.

... Continued

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Toluene	0.0745	0.0865	mg/L	1	0.10	<0.001	74	15	82 - 108	4
Ethylbenzene	0.0741	0.0861	mg/L	1	0.10	<0.001	74	15	86 - 115	6
M,P,O-Xylene	0.229	0.261	mg/L	1	0.30	<0.001	76	13	79 - 122	29

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0831	0.0898	mg/L	1	0.10	83	90	70 - 130
4-BFB	0.0823	0.0879	mg/L	1	0.10	82	88	70 - 130

Laboratory Control Spikes

QCBatch: QC18853

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Nitrate-N	2.40	2.41	mg/L	1	2.50	<0.2	96	0	90 - 110	20
Sulfate	13.12	12.73	mg/L	1	12.50	<2.0	104	3	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC18854

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	12.45	12.48	mg/L	1	12.50	<2.0	99	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC18861

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.102	0.090	mg/L	1	0.10	<0.001	102	12	82 - 111	7
Benzene	0.0985	0.0954	mg/L	1	0.10	<0.001	98	3	86 - 106	5
Toluene	0.0982	0.0952	mg/L	1	0.10	<0.001	98	3	82 - 108	4
Ethylbenzene	0.0979	0.0949	mg/L	1	0.10	<0.001	98	3	86 - 115	6
M,P,O-Xylene	0.299	0.289	mg/L	1	0.30	<0.001	100	3	79 - 122	29

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0957	0.0923	mg/L	1	0.10	96	92	70 - 130
4-BFB	0.0914	0.0867	mg/L	1	0.10	91	87	70 - 130

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC18853

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Nitrate-N	12.67	12.76	mg/L	1	12.50	<1.00	101	1	84 - 105	20
Sulfate	253.38	251.75	mg/L	1	62.50	195	93	1	79 - 104	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC18802

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0926	93	85 - 115	3/13/02
Benzene		mg/L	0.10	0.095	95	85 - 115	3/13/02
Toluene		mg/L	0.10	0.0951	95	85 - 115	3/13/02
Ethylbenzene		mg/L	0.10	0.0956	96	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.293	98	85 - 115	3/13/02

CCV (2)

QCBatch: QC18802

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	3/13/02
Benzene		mg/L	0.10	0.094	94	85 - 115	3/13/02
Toluene		mg/L	0.10	0.095	95	85 - 115	3/13/02
Ethylbenzene		mg/L	0.10	0.095	95	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.291	97	85 - 115	3/13/02

ICV (1)

QCBatch: QC18802

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0938	94	85 - 115	3/13/02
Benzene		mg/L	0.10	0.0986	99	85 - 115	3/13/02
Toluene		mg/L	0.10	0.0995	100	85 - 115	3/13/02
Ethylbenzene		mg/L	0.10	0.0999	100	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.304	101	85 - 115	3/13/02

CCV (1)

QCBatch: QC18803

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	3/13/02
Benzene		mg/L	0.10	0.0895	90	85 - 115	3/13/02
Toluene		mg/L	0.10	0.0854	85	85 - 115	3/13/02
Ethylbenzene	[13]	mg/L	0.10	0.0843	84	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.254	85	85 - 115	3/13/02

CCV (2) QCBatch: QC18803

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.089	89	85 - 115	3/13/02
Benzene		mg/L	0.10	0.085	85	85 - 115	3/13/02
Toluene		mg/L	0.10	0.085	85	85 - 115	3/13/02
Ethylbenzene		mg/L	0.10	0.086	86	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.252	84	85 - 115	3/13/02

ICV (1) QCBatch: QC18803

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0934	93	85 - 115	3/13/02
Benzene		mg/L	0.10	0.0921	92	85 - 115	3/13/02
Toluene		mg/L	0.10	0.0889	89	85 - 115	3/13/02
Ethylbenzene		mg/L	0.10	0.0873	87	85 - 115	3/13/02
M,P,O-Xylene		mg/L	0.30	0.270	90	85 - 115	3/13/02

CCV (1) QCBatch: QC18853

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.40	96	90 - 110	3/13/02
Sulfate		mg/L	12.50	12.93	103	90 - 110	3/13/02

ICV (1) QCBatch: QC18853

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	2.50	2.40	96	90 - 110	3/13/02
Sulfate		mg/L	12.50	12.45	99	90 - 110	3/13/02

[13] Ethylbenzene outside normal limits. Average of CCV components within acceptable range.

CCV (1) QCBatch: QC18854

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	12.56	100	90 - 110	3/13/02

ICV (1) QCBatch: QC18854

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	13.37	106	90 - 110	3/13/02

CCV (1) QCBatch: QC18861

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0947	95	85 - 115	3/14/02
Benzene		mg/L	0.10	0.0986	99	85 - 115	3/14/02
Toluene		mg/L	0.10	0.0982	98	85 - 115	3/14/02
Ethylbenzene		mg/L	0.10	0.0973	97	85 - 115	3/14/02
M,P,O-Xylene		mg/L	0.30	0.297	99	85 - 115	3/14/02

CCV (2) QCBatch: QC18861

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0947	94	85 - 115	3/14/02
Benzene		mg/L	0.10	0.0969	96	85 - 115	3/14/02
Toluene		mg/L	0.10	0.0965	96	85 - 115	3/14/02
Ethylbenzene		mg/L	0.10	0.0961	96	85 - 115	3/14/02
M,P,O-Xylene		mg/L	0.30	0.2931	97	85 - 115	3/14/02

ICV (1) QCBatch: QC18861

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0921	92	85 - 115	3/14/02
Benzene		mg/L	0.10	0.0946	95	85 - 115	3/14/02
Toluene		mg/L	0.10	0.0951	95	85 - 115	3/14/02
Ethylbenzene		mg/L	0.10	0.0949	95	85 - 115	3/14/02
M,P,O-Xylene		mg/L	0.30	0.289	96	85 - 115	3/14/02

AO 31

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0302-1

Chain of Custody

Date 3-12-02 Page 1 of 2

Lab Name: ~~Environmental Lab of Texas~~ Trace Analysis Inc
Address: ~~12600 W I-20 East~~ 6701 Aberdeen
~~Odessa, Texas 79765~~ Lubbock, Tx 79424
Telephone: ~~(915) 563-1800~~ 806-794-1296

Sampler's (SIGNATURES) Gil Van Deventer, John Fox

Analysis Request

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	Ions: SO_4, NO_3, Cl, & TDS	SO_4 & NO_3				Number of Containers
MW-1 192673	Water	3-11-02	1100		✓															✓				2
MW-2 74	Water	3-11-02	1200		✓															✓				3
MW-8 75	Water	3-11-02	1250		✓															✓				3
MW-7 76	Water	3-11-02	1315		✓															✓				3
MW-3 77	Water	3-11-02	1430		✓															✓				3
MW-9 78	Water	3-11-02	1520		✓															✓				3
MW-12 79	Water	3-12-02	0820		✓															✓				3
MW-11 80	Water	3-12-02	0900		✓															✓				3
MW-13 81	Water	3-12-02	0940		✓															✓				3
MW-10 82	Water	3-12-02	1010		✓															✓				3

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Gil Van Deventer	(Printed Name)	(Printed Name)
(Signature) Gil Van Deventer	(Signature)	(Signature)
(Date) 3-12-02 (Time) 2:40pm	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)** Vicki Hensley
(Printed Name)	(Printed Name)	(Printed Name) Vicki Hensley
(Signature)	(Signature)	(Signature) Trace Analysis
(Date) (Time)	(Date) (Time)	(Date) 10-13-02 (Time) 10:00am

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

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4° Tulsa DLF 2/21/03

A[redacted]

TRIDENT ENVIRONMENTAL

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0302-2

Chain of Custody

Date 3-12-02 Page 2 of 2

Lab Name: ~~Environmental Lab of Texas~~ Trace Analysis Inc
Address: ~~12600 W I-20 East~~ 6701 Aberdeen
~~Odessa, Texas 79765~~ Lubbock Tx 79424
Telephone: ~~(915) 563-1800~~ 806/794-1296

Samplers (SIGNATURES) Gil Van Deventer

Sample Type: G - Grab, C- Composite

Analysis Request

Sample Identification	Matrix	Date	Time	Sample Type	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	Ions: SO_4, NO_3, Cl, & TDS	SO_4 & NO_3					Number of Containers
MW-10d 192683	Water	3-12-02	1110		✓															✓					3
MW-5 84	Water	3-12-02	1245	2N	✓															✓					3
MW-4 85	Water	3-12-02	1250		✓															✓					3
Rinsate 86	Water	3-12-02	1200		✓																				2
Duplicate 87	Water	3-12-02	0000		✓																				2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Gil Van Deventer	(Printed Name)	(Printed Name)
(Signature) Gil Van Deventer	(Signature)	(Signature)
(Date) 3-12-02 (Time) 2:40pm	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)** Vicki Henslee
(Printed Name)	(Printed Name)	(Printed Name) Vicki Hensley
(Signature)	(Signature)	(Signature) Trace Analysis
(Date) (Time)	(Date) (Time)	(Date) 3-13-02 (Time) 10am

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Copy signed original form for Trident Environmental records

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS. NM 88240

ANALYTICAL RESULTS FOR
TRIDENT ENVIRONMENTAL
ATTN: GILBERT VAN DEVENTER
P.O. BOX 7624
MIDLAND, TX 79708
FAX TO: (915) 682-0727

Receiving Date: 09/25/02
Reporting Date: 09/27/02
Project Number: V-101
Project Name: DUKE ENERGY FIELD SERVICES
Project Location: LINAM RANCH GAS PLANT

Sampling Date: 09/25/02
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	NO_3 (mg/L)	SO_4 (mg/L)	TDS (mg/L)	Cl^- (mg/L)
ANALYSIS DATE		09/26/02	09/26/02	09/27/02	09/26/02
H7071-1	MW 1	0.15	293	1251	80
H7071-2	MW 2	1.19	49.2	398	68
H7071-3	MW 3	2.85	58.5	235	24
H7071-4	MW 4	3.94	21.9	1944	820
H7071-5	MW 6	0.96	8.16	1312	584
H7071-6	MW 8	4.54	49.3	416	56
H7071-7	MW 9	1.69	31.9	615	84
H7071-8	MW 10D	0.64	253	1127	120
Quality Control		2.83	49.34	NR	1000
True Value QC		3.00	50.00	NR	1000
% Recovery		94.2	98.7	NR	100
Relative Percent Difference		1.0	0.2	8.8	8.0
METHODS: EPA 600/4-79-020,		352.1	375.4	160.1	325.3

Amy Hill
Chemist
H7071

9-27-02
Date

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	Trident Environmental
Project Manager:	Gilbert Van Deventer
Address:	PO Box 7624
City:	Midland State: Tx Zip: 79708
Phone #:	915-682-0808 Fax #: 915-682-0727
Project #:	V-101 Project Owner: DEFS
Project Name:	Duke Energy Field Services
Project Location:	Linam Ranch Gas Plant
Sampler Name:	

BILL TO

P.O. #:	
Company:	Duke Energy Field
Attn:	Steve Weathers
Address:	PO Box 5493
City:	Denver
State:	CO Zip: 80217
Phone #:	303 605-1718
Fax #:	303- -1957

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING DATE	TIME	NO_3, SO_4, Cl, TDS
H7071-1	MW-1		1	✓							✓		9-25-02	1130	✓
-2	MW-2		2	✓							✓		9-25-02	1600	✓
-3	MW-3		1	✓							✓		9-25-02	1020	✓
-4	MW-4		2	✓							✓		9-25-02	1710	✓
-5	MW-6		2	✓							✓		9-25-02	~~1350~~ 1700	✓
-6	MW-8		1	✓							✓		9-25-02	1340	✓
-7	MW-9		1	✓							✓		9-25-02	1305	✓
-8	MW-10d		1	✓							✓		9-25-02	1259	✓

Sampler Relinquished:	Date: 9-25-02 Time: 1800	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
Relinquished By:	Date: Time:	Received By: (Lab Staff)	Fax Result: ☐ Yes ☐ No Add'l Fax #:
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool: ☒ Yes ☐ No Intact: ☒ Yes ☐ No	CHECKED BY: (Initials)

REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS. NM 88240

ANALYTICAL RESULTS FOR
TRIDENT ENVIRONMENTAL
ATTN: GILBERT VAN DEVENTER
P.O. BOX 7624
MIDLAND, TX 79708
FAX TO: (915) 682-0727

Receiving Date: 09/26/02
Reporting Date: 10/01/02
Project Number: V-102
Project Name: DUKE ENERGY FIELD SERVICES
Project Location: LINAM RANCH GAS PLANT

Sampling Date: 09/26/02
Sample Type: GROUNDWATER
Sample Condition: COOL & INTACT
Sample Received By: BC
Analyzed By: AH

LAB NUMBER	SAMPLE ID	NO_3 (mg/L)	SO_4 (mg/L)	TDS (mg/L)	Cl^- (mg/L)
ANALYSIS DATE		09/27/02	09/27/02	09/29/02	09/27/02
H7078-1	MW 7	5.23	41.6	684	112
H7078-2	MW 12	3.14	107	1488	276
H7078-3	MW 13	3.09	171	1098	96
H7078-4	MW 11	3.33	47.9	896	80
H7078-5	MW 10	0.91	133	1140	112
H7078-6	MW 5	1.6	95.8	1330	260
Quality Control		2.83	49.34	NR	1000
True Value QC		3.00	50.00	NR	1000
% Recovery		94.2	98.7	NR	100
Relative Percent Difference		1.0	0.2	8.8	8.0
METHODS: EPA 600/4-79-020,		352.1	375.4	160.1	325.3

Amy Hill
Chemist
H7078

10-01-02
Date

CARDINAL LABORATORIES, INC.

2111 Beechwood, Abilene, TX 79603 101 East Marland, Hobbs, NM 88240
(915) 673-7001 Fax (915) 673-7020 (505) 393-2326 Fax (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Page 1 of 1

Company Name:	Trident Environmental
Project Manager:	Gilbert Van Deventer
Address:	PO Box 7624
City:	Midland State: Tx Zip: 79708
Phone #:	915 682 0808 Fax #: 915-682-0727
Project #:	V-102 Project Owner: DEFS
Project Name:	Duke Energy Field Services
Project Location:	Linam Ranch Gas Plant
Sampler Name:	Gilbert Van Deventer

BILL TO

P.O. #:	
Company:	Duke Energy Field Services
Attn:	Steve Weathers
Address:	PO Box 5493
City:	Denver
State:	CO Zip: 80217
Phone #:	303-605-1718
Fax #:	303-392-1957

ANALYSIS REQUEST

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	CRUDE OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	Sulfate (SO4)	Nitrate (NO3)	Chloride (Cl)	TDS (160.1)
H70784	MW-7	G	1	✓									9-26-02	0830	✓	✓	✓	✓
-2	MW-12	G	1	✓									9-26-02	1030	✓	✓	✓	✓
-3	MW-13	G	1	✓									9-26-02	1120	✓	✓	✓	✓
-4	MW-11	G	1	✓									9-26-02	1210	✓	✓	✓	✓
-5	MW-10	G	1	✓									9-26-02	1300	✓	✓	✓	✓
-6	MW-5	G	1	✓									9-26-02	1430	✓	✓	✓	✓

Sampler Relinquished: Gilbert Van Deventer	Date: 9-26-02 Time: 1855	Received By:	
Relinquished By:	Date: Time:	Received By: (Lab Staff) Burgess A. Cooke	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Sample Condition Cool: ☒ Yes ☐ No Intact: ☒ Yes ☐ No	CHECKED BY: (Initials)

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☒ Yes ☐ No Add'l Fax #:
REMARKS:

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476.

Summary Report

Dale Littlejohn
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: October 3, 2002

Order ID Number: A02092720

Project Number: CC # V-102
Project Name: Duke Energy Field Services
Project Location: Linam Ranch Plant

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
209027	MW-3	Water	9/25/02	10:20	9/27/02
209028	MW-1	Water	9/25/02	11:30	9/27/02
209029	MW-10D	Water	9/25/02	12:59	9/27/02
209030	MW-9	Water	9/25/02	13:05	9/27/02
209031	MW-8	Water	9/25/02	15:40	9/27/02
209032	MW-2	Water	9/25/02	16:00	9/27/02
209033	MW-4	Water	9/25/02	17:10	9/27/02
209034	MW-6	Water	9/25/02	17:00	9/27/02
209035	MW-7	Water	9/26/02	8:30	9/27/02
209036	MW-12	Water	9/26/02	10:30	9/27/02
209037	MW-13	Water	9/26/02	11:20	9/27/02
209038	MW-11	Water	9/26/02	12:10	9/27/02
209039	MW-10	Water	9/26/02	13:00	9/27/02
209040	MW-5	Water	9/26/02	14:30	9/27/02
209041	Duplicate	Water	9/26/02	:	9/27/02
209042	Rinsate	Water	9/26/02	14:50	9/27/02
209043	Trip Blank	Water	9/26/02	:	9/27/02

0 This report consists of a total of 5 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
209027 - MW-3	<0.001	<0.001	<0.001	<0.001	<0.001
209028 - MW-1	<0.005	<0.005	<0.005	<0.005	<0.005
209029 - MW-10D	<0.001	<0.001	<0.001	<0.001	<0.001
209030 - MW-9	0.071	<0.001	<0.001	0.002	0.073
209031 - MW-8	<0.001	<0.001	<0.001	<0.001	<0.001
209032 - MW-2	<0.001	<0.001	<0.001	<0.001	<0.001
209033 - MW-4	18.8	<0.100	0.526	<0.100	19.3
209034 - MW-6	1.29	<0.050	0.134	0.0584	1.48
209035 - MW-7	<0.005	<0.005	<0.005	<0.005	<0.005
209036 - MW-12	<0.001	<0.001	<0.001	<0.001	<0.001
209037 - MW-13	<0.001	<0.001	<0.001	<0.001	<0.001
209038 - MW-11	0.0018	<0.001	<0.001	<0.001	0.0018
209039 - MW-10	3.48	<0.100	0.290	0.155	3.92

Continued ...

This is only a summary. Please, refer to the complete report package for quality control data.

Continued ...

Sample - Field Code	BTEX Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
209040 - MW-5	0.381	<0.050	0.588	0.112	1.08
209041 - Duplicate	2.90	<0.050	0.222	0.109	3.23
209042 - Rinsate	<0.005	<0.005	<0.005	<0.005	<0.005
209043 - Trip Blank	<0.001	<0.001	<0.001	<0.001	<0.001

Sample: 209027 - MW-3

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.299	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		<0.050	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 209028 - MW-1

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		0.0616	mg/L
Total Barium		0.258	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		<0.050	mg/L
Total Manganese		0.164	mg/L
Total Silver		<0.0125	mg/L

Sample: 209029 - MW-10D

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.171	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		1.05	mg/L
Total Manganese		0.374	mg/L
Total Silver		<0.0125	mg/L

Sample: 209030 - MW-9

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.746	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		<0.050	mg/L
Total Manganese		0.0398	mg/L
Total Silver		<0.0125	mg/L

Sample: 209031 - MW-8

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.181	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		<0.050	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 209032 - MW-2

Param	Flag	Result	Units
Total Aluminum		0.158	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.910	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		0.0904	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 209033 - MW-4

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		0.083	mg/L
Total Barium		1.03	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		12.6	mg/L
Total Manganese		0.132	mg/L
Total Silver		<0.0125	mg/L

Sample: 209034 - MW-6

Param	Flag	Result	Units
Total Aluminum		0.148	mg/L
Total Arsenic		0.0896	mg/L
Total Barium		1.55	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		7.13	mg/L
Total Manganese		0.0752	mg/L
Total Silver		<0.0125	mg/L

Sample: 209035 - MW-7

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.517	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		<0.050	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 209036 - MW-12

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.247	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		<0.050	mg/L
Total Manganese		0.0381	mg/L
Total Silver		<0.0125	mg/L

Sample: 209037 - MW-13

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.284	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		0.0814	mg/L
Total Manganese		0.157	mg/L
Total Silver		<0.0125	mg/L

This is only a summary. Please, refer to the complete report package for quality control data.

Sample: 209038 - MW-11

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.227	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		<0.050	mg/L
Total Manganese		0.155	mg/L
Total Silver		<0.0125	mg/L

Sample: 209039 - MW-10

Param	Flag	Result	Units
Total Aluminum		<0.100	mg/L
Total Arsenic		<0.050	mg/L
Total Barium		0.300	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		0.870	mg/L
Total Manganese		0.455	mg/L
Total Silver		<0.0125	mg/L

Sample: 209040 - MW-5

Param	Flag	Result	Units
Chloride	[1]	249	mg/L
Nitrate-N		<1.0	mg/L
Sulfate		155	mg/L
Total Dissolved Solids		1288	mg/L
Total Aluminum		<0.100	mg/L
Total Arsenic		0.0573	mg/L
Total Barium		0.884	mg/L
Total Cadmium		<0.005	mg/L
Total Chromium		<0.010	mg/L
Total Iron		7.30	mg/L
Total Manganese		0.554	mg/L
Total Silver		<0.0125	mg/L

[1]This sample for chloride was rcran on IC093002-1. ICV = 93%; CCV = 93%; LCS = 94 and RPD = 0; MS = 92 and RPD = 0.

This is only a summary. Please, refer to the complete report package for quality control data.

TRACEANALYSIS, INC.

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Analytical and Quality Control Report

Dale Littlejohn
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: October 3, 2002

Order ID Number: A02092720

Project Number: CC # V-102
Project Name: Duke Energy Field Services
Project Location: Linam Ranch Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
209027	MW-3	Water	9/25/02	10:20	9/27/02
209028	MW-1	Water	9/25/02	11:30	9/27/02
209029	MW-10D	Water	9/25/02	12:59	9/27/02
209030	MW-9	Water	9/25/02	13:05	9/27/02
209031	MW-8	Water	9/25/02	15:40	9/27/02
209032	MW-2	Water	9/25/02	16:00	9/27/02
209033	MW-4	Water	9/25/02	17:10	9/27/02
209034	MW-6	Water	9/25/02	17:00	9/27/02
209035	MW-7	Water	9/26/02	8:30	9/27/02
209036	MW-12	Water	9/26/02	10:30	9/27/02
209037	MW-13	Water	9/26/02	11:20	9/27/02
209038	MW-11	Water	9/26/02	12:10	9/27/02
209039	MW-10	Water	9/26/02	13:00	9/27/02
209040	MW-5	Water	9/26/02	14:30	9/27/02
209041	Duplicate	Water	9/26/02	:	9/27/02
209042	Rinsate	Water	9/26/02	14:50	9/27/02
209043	Trip Blank	Water	9/26/02	:	9/27/02

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. Note: the RDL is equal to MQL for all organic analytes including TPH.
The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

Note: Samples will be disposed of 30 days from the report date unless the lab is contacted before the 30 days has past.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 209027 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.103	mg/L	1	0.10	103	70 - 130
4-BFB		0.0967	mg/L	1	0.10	97	70 - 130

Sample: 209027 - MW-3

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC23896	Date Analyzed:	10/2/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB22329	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.299	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209028 - MW-1

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0944	mg/L	5	0.10	94	70 - 130
4-BFB		0.0859	mg/L	5	0.10	85	70 - 130

Sample: 209028 - MW-1

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC23896	Date Analyzed:	10/2/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB22329	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		0.0616	mg/L	1	0.05
Total Barium		0.258	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		0.164	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209029 - MW-10D

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.104	mg/L	1	0.10	104	70 - 130
4-BFB		0.0972	mg/L	1	0.10	97	70 - 130

Sample: 209029 - MW-10D

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC23896	Date Analyzed:	10/2/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB22329	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.171	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		1.05	mg/L	1	0.05
Total Manganese		0.374	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209030 - MW-9

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.071	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.002	mg/L	1	0.001
Total BTEX		0.073	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.101	mg/L	1	0.10	101	70 - 130
4-BFB		0.096	mg/L	1	0.10	96	70 - 130

Sample: 209030 - MW-9

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC23896 | Date Analyzed: 10/2/02
Analyst: RR | Preparation Method: S 3010A | Prep Batch: PB22329 | Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.746	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		0.0398	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209031 - MW-8

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC23833 | Date Analyzed: 9/27/02
Analyst: CG | Preparation Method: S 5030B | Prep Batch: PB22282 | Date Prepared: 9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0948	mg/L	1	0.10	95	70 - 130
4-BFB		0.0934	mg/L	1	0.10	93	70 - 130

Sample: 209031 - MW-8

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC23896 | Date Analyzed: 10/2/02
Analyst: RR | Preparation Method: S 3010A | Prep Batch: PB22329 | Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.181	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209032 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.104	mg/L	1	0.10	104	70 - 130
4-BFB		0.0959	mg/L	1	0.10	96	70 - 130

Sample: 209032 - MW-2

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC23896	Date Analyzed:	10/2/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB22329	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.158	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.910	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		0.0904	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209033 - MW-4

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		18.8	mg/L	100	0.001
Toluene		<0.100	mg/L	100	0.001
Ethylbenzene		0.526	mg/L	100	0.001

Continued ...

... *Continued* Sample: 209033 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
M,P,O-Xylene		<0.100	mg/L	100	0.001
Total BTEX		19.3	mg/L	100	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0975	mg/L	100	0.10	97	70 - 130
4-BFB		0.0924	mg/L	100	0.10	92	70 - 130

Sample: 209033 - MW-4

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC23896 | Date Analyzed: 10/2/02
Analyst: RR | Preparation Method: S 3010A | Prep Batch: PB22329 | Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		0.083	mg/L	1	0.05
Total Barium		1.03	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		12.6	mg/L	1	0.05
Total Manganese		0.132	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209034 - MW-6

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC23833 | Date Analyzed: 9/27/02
Analyst: CG | Preparation Method: S 5030B | Prep Batch: PB22282 | Date Prepared: 9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.29	mg/L	50	0.001
Toluene		<0.050	mg/L	50	0.001
Ethylbenzene		0.134	mg/L	50	0.001
M,P,O-Xylene		0.0584	mg/L	50	0.001
Total BTEX		1.48	mg/L	50	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0928	mg/L	50	0.10	92	70 - 130
4-BFB		0.088	mg/L	50	0.10	88	70 - 130

Sample: 209034 - MW-6

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC23896 | Date Analyzed: 10/2/02
Analyst: RR | Preparation Method: S 3010A | Prep Batch: PB22329 | Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.148	mg/L	1	0.10
Total Arsenic		0.0896	mg/L	1	0.05

Continued ...

... *Continued* Sample: 209034 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Barium		1.55	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		7.13	mg/L	1	0.05
Total Manganese		0.0752	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209035 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23860	Date Analyzed:	9/30/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22306	Date Prepared:	9/30/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0915	mg/L	5	0.10	91	70 - 130
4-BFB		0.0757	mg/L	5	0.10	75	70 - 130

Sample: 209035 - MW-7

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC23896	Date Analyzed:	10/2/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB22329	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.517	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209036 - MW-12

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001

Continued ...

... *Continued* Sample: 209036 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.102	mg/L	1	0.10	102	70 - 130
4-BFB		0.0948	mg/L	1	0.10	95	70 - 130

Sample: 209036 - MW-12

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC23896 | Date Analyzed: 10/2/02
Analyst: RR | Preparation Method: S 3010A | Prep Batch: PB22329 | Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.247	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		0.0381	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209037 - MW-13

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC23833 | Date Analyzed: 9/27/02
Analyst: CG | Preparation Method: S 5030B | Prep Batch: PB22282 | Date Prepared: 9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.102	mg/L	1	0.10	102	70 - 130
4-BFB		0.0987	mg/L	1	0.10	99	70 - 130

Sample: 209037 - MW-13

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC23897 | Date Analyzed: 10/2/02
Analyst: RR | Preparation Method: S 3010A | Prep Batch: PB22329 | Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.284	mg/L	1	0.10

Continued ...

... Continued Sample: 209037 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		0.0814	mg/L	1	0.05
Total Manganese		0.157	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209038 - MW-11

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23833	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22282	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0018	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.0018	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.101	mg/L	1	0.10	101	70 - 130
4-BFB		0.0926	mg/L	1	0.10	93	70 - 130

Sample: 209038 - MW-11

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC23897	Date Analyzed:	10/2/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB22329	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.227	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		<0.050	mg/L	1	0.05
Total Manganese		0.155	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209039 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23835	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22283	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		3.48	mg/L	100	0.001
Toluene		<0.100	mg/L	100	0.001
Ethylbenzene		0.290	mg/L	100	0.001
M,P,O-Xylene		0.155	mg/L	100	0.001
Total BTEX		3.92	mg/L	100	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0953	mg/L	100	0.10	95	70 - 130
4-BFB		0.0899	mg/L	100	0.10	89	70 - 130

Sample: 209039 - MW-10

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC23897 Date Analyzed: 10/2/02
Analyst: RR Preparation Method: S 3010A Prep Batch: PB22329 Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		<0.050	mg/L	1	0.05
Total Barium		0.300	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		0.870	mg/L	1	0.05
Total Manganese		0.455	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209040 - MW-5

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC23835 Date Analyzed: 9/27/02
Analyst: CG Preparation Method: S 5030B Prep Batch: PB22283 Date Prepared: 9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.381	mg/L	50	0.001
Toluene		<0.050	mg/L	50	0.001
Ethylbenzene		0.588	mg/L	50	0.001
M,P,O-Xylene		0.112	mg/L	50	0.001
Total BTEX		1.08	mg/L	50	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0945	mg/L	50	0.10	94	70 - 130
4-BFB		0.0902	mg/L	50	0.10	90	70 - 130

Sample: 209040 - MW-5

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC23830 Date Analyzed: 9/27/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB22276 Date Prepared: 9/27/02

Param	Flag	Result	Units	Dilution	RDL
Chloride	[1]	249	mg/L	10	1
Nitrate-N		<1.0	mg/L	5	0.20
Sulfate		155	mg/L	5	1

[1]This sample for chloride was reran on IC093002-1. ICV = 93%; CCV = 93%; LCS = 94 and RPD = 0; MS = 92 and RPD = 0.

Sample: 209040 - MW-5

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC23889	Date Analyzed:	10/1/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB22340	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1288	mg/L	2	10

Sample: 209040 - MW-5

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC23897	Date Analyzed:	10/2/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB22329	Date Prepared:	10/1/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.100	mg/L	1	0.10
Total Arsenic		0.0573	mg/L	1	0.05
Total Barium		0.884	mg/L	1	0.10
Total Cadmium		<0.005	mg/L	1	0.005
Total Chromium		<0.010	mg/L	1	0.01
Total Iron		7.30	mg/L	1	0.05
Total Manganese		0.554	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 209041 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23835	Date Analyzed:	9/27/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22283	Date Prepared:	9/27/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		2.90	mg/L	50	0.001
Toluene		<0.050	mg/L	50	0.001
Ethylbenzene		0.222	mg/L	50	0.001
M,P,O-Xylene		0.109	mg/L	50	0.001
Total BTEX		3.23	mg/L	50	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0938	mg/L	50	0.10	93	70 - 130
4-BFB		0.0882	mg/L	50	0.10	88	70 - 130

Sample: 209042 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23860	Date Analyzed:	9/30/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22306	Date Prepared:	9/30/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0964	mg/L	5	0.10	96	70 - 130
4-BFB		0.0783	mg/L	5	0.10	78	70 - 130

Sample: 209043 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC23860	Date Analyzed:	9/30/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB22306	Date Prepared:	9/30/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0994	mg/L	1	0.10	99	70 - 130
4-BFB		0.0808	mg/L	1	0.10	81	70 - 130

Quality Control Report
Method Blank

Method Blank QCBatch: QC23830

Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<1.0	mg/L	1

Method Blank QCBatch: QC23833

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0945	mg/L	1	0.10	94	70 - 130
4-BFB		0.0885	mg/L	1	0.10	88	70 - 130

Method Blank QCBatch: QC23835

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0992	mg/L	1	0.10	99	70 - 130
4-BFB		0.0926	mg/L	1	0.10	93	70 - 130

Method Blank QCBatch: QC23860

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[2]	0.0481	mg/L	1	0.10	48	70 - 130
4-BFB	[3]	0.0411	mg/L	1	0.10	41	70 - 130

Method Blank QCBatch: QC23889

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank QCBatch: QC23896

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.100	mg/L	0.10
Total Arsenic		<0.050	mg/L	0.05
Total Barium		<0.100	mg/L	0.10
Total Cadmium		<0.005	mg/L	0.005
Total Chromium		<0.010	mg/L	0.01
Total Iron		<0.050	mg/L	0.05
Total Manganese		<0.025	mg/L	0.02
Total Silver		<0.0125	mg/L	0.01

Method Blank QCBatch: QC23897

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.100	mg/L	0.10
Total Arsenic		<0.050	mg/L	0.05
Total Barium		<0.100	mg/L	0.10
Total Cadmium		<0.005	mg/L	0.005
Total Chromium		<0.010	mg/L	0.01
Total Iron		<0.050	mg/L	0.05
Total Manganese		<0.025	mg/L	0.02
Total Silver		<0.0125	mg/L	0.01

[2]Low surrogate recovery due to prep. ICV, CCV show the method to be in control.
[3]Low surrogate recovery due to prep. ICV, CCV show the method to be in control.

Quality Control Report
Duplicate Samples

Duplicate QCBatch: QC23889

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		2818	2834	mg/L	1	0	9.7

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC23830

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.47	11.43	mg/L	1	12.50	<1.0	91	0	90 - 110	20
Nitrate-N	2.45	2.47	mg/L	1	2.50	<0.2	98	0	90 - 110	20
Sulfate	11.81	12.0	mg/L	1	12.50	<1.0	94	1	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes QCBatch: QC23833

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0895	0.0967	mg/L	1	0.10	<0.001	90	8	70 - 130	20
Benzene	0.0956	0.0983	mg/L	1	0.10	<0.001	96	3	70 - 130	20
Toluene	0.0954	0.0981	mg/L	1	0.10	<0.001	95	3	70 - 130	20
Ethylbenzene	0.0945	0.0968	mg/L	1	0.10	<0.001	94	2	70 - 130	20
M,P,O-Xylene	0.278	0.285	mg/L	1	0.30	<0.001	93	2	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0928	0.0956	mg/L	1	0.10	93	96	70 - 130
4-BFB	0.089	0.0929	mg/L	1	0.10	89	93	70 - 130

Laboratory Control Spikes QCBatch: QC23835

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0966	0.0972	mg/L	1	0.10	<0.001	97	1	70 - 130	20
Benzene	0.100	0.0994	mg/L	1	0.10	<0.001	100	1	70 - 130	20
Toluene	0.0996	0.099	mg/L	1	0.10	<0.001	100	1	70 - 130	20
Ethylbenzene	0.0995	0.0984	mg/L	1	0.10	<0.001	100	1	70 - 130	20

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Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
M,P,O-Xylene	0.291	0.289	mg/L	1	0.30	<0.001	97	1	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.0998	0.0973	mg/L	1	0.10	100	97	70 - 130
4-BFB	0.0958	0.0943	mg/L	1	0.10	96	94	70 - 130

Laboratory Control Spikes

QCBatch: QC23860

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0979	0.0926	mg/L	1	0.10	<0.001	98	6	70 - 130	20
Benzene	0.0983	0.0945	mg/L	1	0.10	<0.001	98	4	70 - 130	20
Toluene	0.0944	0.0931	mg/L	1	0.10	<0.001	94	1	70 - 130	20
Ethylbenzene	0.0913	0.0928	mg/L	1	0.10	<0.001	91	2	70 - 130	20
M,P,O-Xylene	0.265	0.276	mg/L	1	0.30	<0.001	88	4	70 - 130	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.103	0.0992	mg/L	1	0.10	103	99	70 - 130
4-BFB	0.090	0.0908	mg/L	1	0.10	90	91	70 - 130

Laboratory Control Spikes

QCBatch: QC23896

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	0.952	0.962	mg/L	1	1	<0.100	95	1	75 - 125	20
Total Arsenic	0.587	0.566	mg/L	1	0.50	<0.050	117	4	75 - 125	20
Total Barium	0.995	0.998	mg/L	1	1	<0.100	100	0	75 - 125	20
Total Cadmium	0.248	0.250	mg/L	1	0.25	<0.005	99	1	75 - 125	20
Total Chromium	0.0997	0.100	mg/L	1	0.10	<0.010	100	0	75 - 125	20
Total Iron	0.493	0.504	mg/L	1	0.50	<0.050	99	2	75 - 125	20
Total Manganese	0.249	0.250	mg/L	1	0.25	<0.025	100	0	75 - 125	20
Total Silver	0.122	0.123	mg/L	1	0.12	<0.0125	98	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC23897

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	0.952	0.962	mg/L	1	1	<0.100	95	1	75 - 125	20

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Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Arsenic	0.587	0.566	mg/L	1	0.50	<0.050	117	4	75 - 125	20
Total Barium	0.995	0.998	mg/L	1	1	<0.100	100	0	75 - 125	20
Total Cadmium	0.248	0.250	mg/L	1	0.25	<0.005	99	1	75 - 125	20
Total Chromium	0.0997	0.100	mg/L	1	0.10	<0.010	100	0	75 - 125	20
Total Iron	0.493	0.504	mg/L	1	0.50	<0.050	99	2	75 - 125	20
Total Manganese	0.249	0.250	mg/L	1	0.25	<0.025	100	0	75 - 125	20
Total Silver	0.122	0.123	mg/L	1	0.12	<0.0125	98	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes QCBatch: QC23830

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	7367	7364	mg/L	1	6250	1420	95	0	48 - 127	20
Nitrate-N	1166	1163	mg/L	1	1250	0	93	0	87 - 100	20
Sulfate	6208	6157	mg/L	1	6250	164	96	0	59 - 121	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC23896

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.04	1.05	mg/L	1	1	<0.100	104	1	75 - 125	20
Total Arsenic	0.577	0.589	mg/L	1	0.50	<0.050	115	2	75 - 125	20
Total Barium	1.28	1.28	mg/L	1	1	0.299	128	0	75 - 125	20
Total Cadmium	0.245	0.244	mg/L	1	0.25	<0.005	98	0	75 - 125	20
Total Chromium	0.0984	0.0997	mg/L	1	0.10	<0.010	98	1	75 - 125	20
Total Iron	0.500	0.517	mg/L	1	0.50	<0.050	100	3	75 - 125	20
Total Manganese	0.247	0.248	mg/L	1	0.25	<0.025	99	0	75 - 125	20
Total Silver	0.124	0.124	mg/L	1	0.12	<0.0125	99	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC23897

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.13	1.12	mg/L	1	1	<0.100	113	1	75 - 125	20
Total Arsenic	0.577	0.559	mg/L	1	0.50	<0.050	115	3	75 - 125	20

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Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Barium	1.27	1.25	mg/L	1	1	0.284	98	2	75 - 125	20
Total Cadmium	0.238	0.237	mg/L	1	0.25	<0.005	95	0	75 - 125	20
Total Chromium	0.0959	0.0951	mg/L	1	0.10	<0.010	96	1	75 - 125	20
Total Iron	0.601	0.569	mg/L	1	0.50	0.0814	103	6	75 - 125	20
Total Manganese	0.404	0.399	mg/L	1	0.25	0.157	98	2	75 - 125	20
Total Silver	0.124	0.123	mg/L	1	0.12	<0.0125	99	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1) QCBatch: QC23830

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.42	91	90 - 110	9/27/02
Nitrate-N		mg/L	2.50	2.45	98	90 - 110	9/27/02
Sulfate		mg/L	12.50	12.00	96	90 - 110	9/27/02

ICV (1) QCBatch: QC23830

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.53	92	90 - 110	9/27/02
Nitrate-N		mg/L	2.50	2.48	99	90 - 110	9/27/02
Sulfate		mg/L	12.50	12.01	96	90 - 110	9/27/02

CCV (1) QCBatch: QC23833

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.098	98	85 - 115	9/27/02
Benzene		mg/L	0.10	0.0997	100	85 - 115	9/27/02
Toluene		mg/L	0.10	0.0987	99	85 - 115	9/27/02
Ethylbenzene		mg/L	0.10	0.0978	98	85 - 115	9/27/02
M,P,O-Xylene		mg/L	0.30	0.286	95	85 - 115	9/27/02

CCV (2) QCBatch: QC23833

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.098	98	85 - 115	9/27/02
Benzene		mg/L	0.10	0.1	100	85 - 115	9/27/02
Toluene		mg/L	0.10	0.0992	99	85 - 115	9/27/02
Ethylbenzene		mg/L	0.10	0.1	100	85 - 115	9/27/02
M,P,O-Xylene		mg/L	0.30	0.292	97	85 - 115	9/27/02

ICV (1) QCBatch: QC23833

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0979	98	85 - 115	9/27/02
Benzene		mg/L	0.10	0.0983	98	85 - 115	9/27/02
Toluene		mg/L	0.10	0.0975	98	85 - 115	9/27/02
Ethylbenzene		mg/L	0.10	0.0977	98	85 - 115	9/27/02
M,P,O-Xylene		mg/L	0.30	0.288	96	85 - 115	9/27/02

CCV (1) QCBatch: QC23835

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.098	98	85 - 115	9/27/02
Benzene		mg/L	0.10	0.101	101	85 - 115	9/27/02
Toluene		mg/L	0.10	0.101	101	85 - 115	9/27/02
Ethylbenzene		mg/L	0.10	0.0999	100	85 - 115	9/27/02
M,P,O-Xylene		mg/L	0.30	0.293	98	85 - 115	9/27/02

CCV (2) QCBatch: QC23835

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0956	95	85 - 115	9/27/02
Benzene		mg/L	0.10	0.101	101	85 - 115	9/27/02
Toluene		mg/L	0.10	0.101	101	85 - 115	9/27/02
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	9/27/02
M,P,O-Xylene		mg/L	0.30	0.295	98	85 - 115	9/27/02

ICV (1) QCBatch: QC23835

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0939	94	85 - 115	9/27/02
Benzene		mg/L	0.10	0.0991	99	85 - 115	9/27/02
Toluene		mg/L	0.10	0.0988	99	85 - 115	9/27/02
Ethylbenzene		mg/L	0.10	0.0987	99	85 - 115	9/27/02
M,P,O-Xylene		mg/L	0.30	0.288	96	85 - 115	9/27/02

CCV (1) QCBatch: QC23860

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	9/30/02
Benzene		mg/L	0.10	0.0936	94	85 - 115	9/30/02
Toluene		mg/L	0.10	0.0911	91	85 - 115	9/30/02
Ethylbenzene		mg/L	0.10	0.0909	91	85 - 115	9/30/02
M,P,O-Xylene		mg/L	0.30	0.271	90	85 - 115	9/30/02

CCV (2) QCBatch: QC23860

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0908	90	85 - 115	9/30/02
Benzene		mg/L	0.10	0.0894	89	85 - 115	9/30/02
Toluene		mg/L	0.10	0.0886	88	85 - 115	9/30/02
Ethylbenzene		mg/L	0.10	0.0884	88	85 - 115	9/30/02
M,P,O-Xylene		mg/L	0.30	0.265	88	85 - 115	9/30/02

ICV (1) QCBatch: QC23860

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0866	87	85 - 115	9/30/02
Benzene		mg/L	0.10	0.0854	85	85 - 115	9/30/02
Toluene		mg/L	0.10	0.0853	85	85 - 115	9/30/02
Ethylbenzene		mg/L	0.10	0.0867	87	85 - 115	9/30/02
M,P,O-Xylene		mg/L	0.30	0.263	88	85 - 115	9/30/02

CCV (1) QCBatch: QC23889

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1006	100	90 - 110	10/1/02

ICV (1) QCBatch: QC23889

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	975	97	90 - 110	10/1/02

CCV (1) QCBatch: QC23896

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.92	96	90 - 110	10/2/02
Total Arsenic		mg/L	1	0.970	97	90 - 110	10/2/02
Total Barium		mg/L	2	1.95	98	90 - 110	10/2/02
Total Cadmium		mg/L	0.50	0.485	97	90 - 110	10/2/02
Total Chromium		mg/L	0.20	0.193	96	90 - 110	10/2/02
Total Iron		mg/L	1	0.954	95	90 - 110	10/2/02
Total Manganese		mg/L	0.50	0.488	98	90 - 110	10/2/02
Total Silver		mg/L	0.25	0.244	98	90 - 110	10/2/02

ICV (1) QCBatch: QC23896

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.88	94	95 - 105	10/2/02
Total Arsenic		mg/L	1	0.980	98	95 - 105	10/2/02
Total Barium		mg/L	2	1.92	96	95 - 105	10/2/02
Total Cadmium		mg/L	0.50	0.482	96	95 - 105	10/2/02
Total Chromium		mg/L	0.20	0.195	98	95 - 105	10/2/02
Total Iron		mg/L	1	0.961	96	95 - 105	10/2/02
Total Manganese		mg/L	0.50	0.482	96	95 - 105	10/2/02
Total Silver		mg/L	0.25	0.241	96	95 - 105	10/2/02

CCV (1) QCBatch: QC23897

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.92	96	90 - 110	10/2/02

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Arsenic		mg/L	1	0.970	97	90 - 110	10/2/02
Total Barium		mg/L	2	1.95	98	90 - 110	10/2/02
Total Cadmium		mg/L	0.50	0.485	97	90 - 110	10/2/02
Total Chromium		mg/L	0.20	0.193	96	90 - 110	10/2/02
Total Iron		mg/L	1	0.954	95	90 - 110	10/2/02
Total Manganese		mg/L	0.50	0.488	98	90 - 110	10/2/02
Total Silver		mg/L	0.25	0.244	98	90 - 110	10/2/02

ICV (1) QCBatch: QC23897

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.88	94	95 - 105	10/2/02
Total Arsenic		mg/L	1	0.980	98	95 - 105	10/2/02
Total Barium		mg/L	2	1.92	96	95 - 105	10/2/02
Total Cadmium		mg/L	0.50	0.482	96	95 - 105	10/2/02
Total Chromium		mg/L	0.20	0.195	98	95 - 105	10/2/02
Total Iron		mg/L	1	0.961	96	95 - 105	10/2/02
Total Manganese		mg/L	0.50	0.482	96	95 - 105	10/2/02
Total Silver		mg/L	0.25	0.241	96	95 - 105	10/2/02

TRIDENT ENVIRONMENTAL

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Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0902-2

Chain of Custody

Date 9/26/02 Page 1 of 2

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 806-794-1296

Samplers (SIGNATURES)

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	Ions: SO_4, NO_3, Cl, & TDS						Number of Containers
MW-3 209027	Water	9/25/02	1020	G	✓													✓							3
MW-1 28	"	"	1130	G	✓													✓							3
MW-10d 29	"	"	1259	G	✓													✓							3
MW-9 30	"	"	1305	G	✓													✓							3
MW-8 31	"	"	1540	G	✓													✓							3
MW-2 32	"	"	1600	G	✓													✓							3
MW-4 33	"	"	1710	G	✓													✓							3
MW-6 34	"	"	1700	G	✓													✓							3
MW-7 35	"	9/26/02	0830	G	✓													✓							3
MW-12 36	"	"	1030	G	✓													✓							3

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name)	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) (Time)	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TraceAnalysis		
(Printed Name) Vicki Hopkey	(Printed Name)	(Printed Name)
(Signature) Vicki Hopkey	(Signature)	(Signature)
(Date) 9-27-02 (Time) 10:—	(Date) (Time)	(Date) (Time)

Copy signed original form for Trident Environmental records

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(915) 682-0808
(915) 682-0727 (Fax)

V-102-0902-1

Chain of Custody

Date 9/26/02 Page 2 of 2

Lab Name: TraceAnalysis Inc.
Address: 6701 Aberdeen, Ste. 9
Lubbock, Texas 79424
Telephone: 806-794-1296

Samplers (SIGNATURES): Dale Thetford

Analysis Request

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	Ions: SO_4, NO_3, Cl, & TDS						Number of Containers
MW-13 209037	Water	9/26/02	1120	G	✓													✓							3
MW-11 38	"	"	1210	G	✓													✓							3
MW-10 39	"	"	1300	G	✓													✓							3
MW-5 40	"	"	1430	G	✓													✓	✓						4
Duplicate 41	"	"	0000 1450	G	✓																				2
Rinsate 42	"	"	~~1230~~	G	✓																				2
Trip Blank (3785) 43			DW	G	✓																				2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
Duke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name)	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) (Time)	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
TraceAnalysis		
(Printed Name) Vicki Hosley	(Printed Name)	(Printed Name)
(Signature) Vicki Hosley	(Signature)	(Signature)
(Date) 9-27-02 (Time) 10:00	(Date) (Time)	(Date) (Time)

Copy signed original form for Trident Environmental records

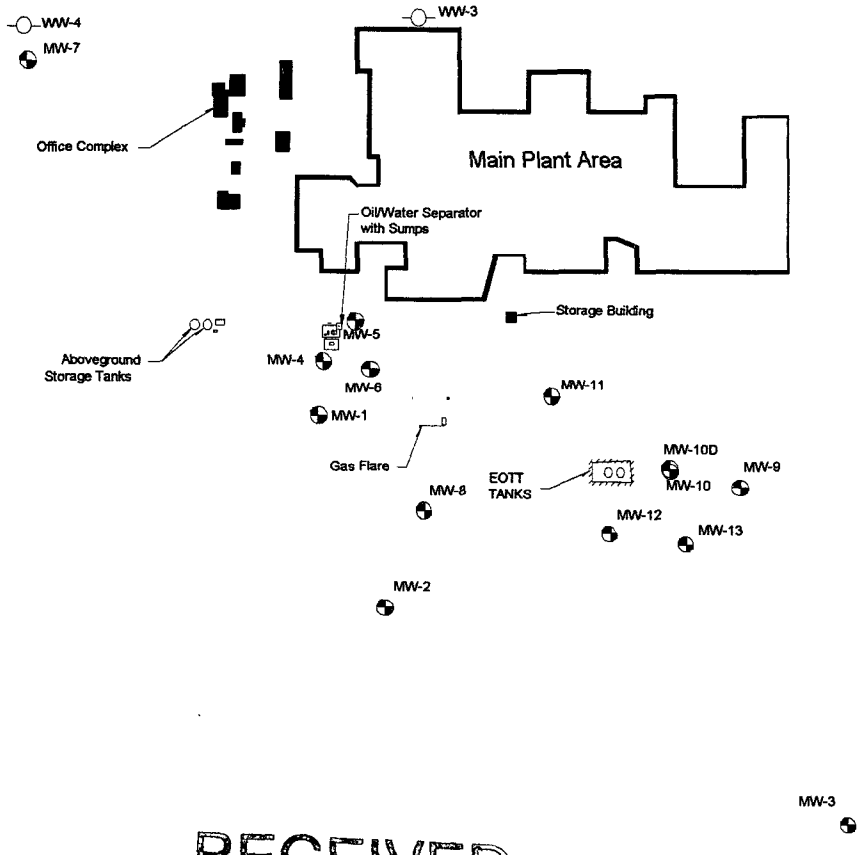
MA

2001 Annual Groundwater Sampling and Monitoring Report
Duke Energy Field Services
Linam Ranch Natural Gas Plant - GW-015
Lea County, New Mexico

JANUARY 28, 2002

Prepared For:

Duke Energy Field Services
P. O. Box 5493
Denver, CO 80217



Prepared By:

TRIDENT ENVIRONMENTAL

P O Box 7624
Midland, Texas 79708

2001 Annual Groundwater Monitoring Report
Duke Energy Field Services
Linam Ranch Gas Plant
Lea County, New Mexico

Prepared by:

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SBMITTED BY: DATE:

Gilbert J. Van Deventer, REM
Project Manager

1-28-02

REVIEWED BY: DATE:

Dale T. Littlejohn
Quality Assurance/Control Officer

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1.0 Executive Summary

Trident Environmental (Trident) was retained by Duke Energy Field Services (DEFS) to perform the sampling and monitoring operations at the Linam Ranch Plant. This 2001 annual report documents the two semi-annual sampling events performed by Trident at the DEFS Linam Ranch Plant on February 6 - 7, 2001 and August 2 - 3, 2001. This report also contains the historical groundwater elevation and analytical data and includes data from all monitoring wells on site. The monitoring and sampling program was conducted in accordance with the revised monitoring plan specified by Mr. Bill Olson of the New Mexico Oil Conservation Division (OCD) in his letter dated March 19, 1999.

Based on the sampling and monitoring data to date, the following conclusions relevant to groundwater conditions at the Linam Ranch Plant are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-10D, MW-11, MW-12 and MW-13 were below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.

- Benzene levels in MW-9 (0.038 mg/L) and MW-10 (1.64 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells. Although benzene concentrations in MW-9 (located downgradient from the EOTT tank area) increased from August 1999 to August 2000 they now appear to have stabilized. The concentrations in all of the other measured hydrocarbon constituents have remained below the laboratory detection levels.

- Dissolved hydrocarbon concentrations in MW-10 (located near the EOTT tank source area) and MW-10D (deeper completed twin to MW-10) have remained stable to decreasing since monitoring began in 1995.

- Dissolved hydrocarbon concentrations in MW-11 (located upgradient from the EOTT tank source area) have also decreased since monitoring began in 1995 and now appear be stabilizing at or below the WQCC standard levels.

- Benzene concentrations in MW-13 (located downgradient from the EOTT tank area) have decreased to below the WQCC standard level for the first time since April of 1996. The concentrations in all of the other measured hydrocarbon constituents have remained at or below the laboratory detection levels. It is suspected that the elevated levels of dissolved benzene in MW-13 from January 1996 to February 2001 indicate a downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-10 during the April 24, 1996 sampling event. Preliminary estimates, based on the maximum benzene levels observed in each well indicate that the benzene slug is migrating at approximately 0.49 feet per day and attenuating at a rate of approximately one half-life per 40 feet. At this rate the benzene slug should not represent an environmental threat to potential future receptors within 160 feet southwest of MW-13.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (liquid waste disposal area) and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of October 9, 2001, the light non-aqueous phase liquids (LNAPL) recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 14 gallons of LNAPL (condensate) from monitoring wells MW-4 and MW-6. The measured thickness of LNAPL in MW-4 has remained below 0.02 feet during the 2001 monitoring period, while the LNAPL thickness in MW-6 has been measured from 0.01 to 0.70 feet over this time.

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2002.

- Discontinue analyses for aluminum, barium, cadmium, chromium, and silver since these constituents have been below WQCC standards for over five years.

- Continue LNAPL removal from MW-4 and MW-6 using absorbent socks with monthly inspections.

2.0 Chronology of Events

February 7, 1994	Geoscience Consultants Ltd (GCL) was retained by ENRON Operations Corporation (ENRON) to address groundwater quality conditions at the Hobbs Gas Plant, which was scheduled for acquisition by GPM. As part of a subsurface investigation for two areas within the plant, GCL completed temporary drive point wells DP-1 and DP-2 downgradient and upgradient, respectively, of the EOTT tanks, and one monitoring well, MW-8, downgradient of the former liquid waste disposal area. Hydrocarbon-impacted groundwater was identified in DP-1.
May 18-22, 1994	Daniel B. Stevens and Associates (DBS&A) completed seven temporary drive point wells (EOTT-1 through EOTT-7) to delineate the horizontal extent of hydrocarbon-impacted soils and groundwater in the EOTT tank area. Drive point well EOTT-6 was converted into monitoring well MW-9. Hydrocarbon-impacted groundwater was identified east of the EOTT tanks.
October 7, 1994	The OCD requested ENRON to provide a work plan to completely define the extent of groundwater contamination at the Hobbs Gas Plant.
November 1994	GPM acquired ownership and operation of the Linam Ranch Plant (formerly Hobbs Gas Plant) from ENRON.
February 23, 1995	GPM submitted a subsurface investigation work plan to the OCD to address the groundwater conditions at Linam Ranch Plant.
April 5, 1995	The OCD approved the subsurface investigation work plan.
May 10-13, 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 five monitoring wells (MW-10D, MW-10, MW-11, MW-12, and MW-13) and two soils borings (SB-1 and SB-2).
September 18, 1995	GPM submitted the *Subsurface Investigation and Preliminary Remedial Response* report for the Linam Ranch Plant to the OCD.
October 19, 1995	The OCD approved GPM's recommendations for remedial action, which included a quarterly sampling and monitoring program.
November 14, 1995	GCL conducted the fourth quarter 1995 sampling event at Linam Ranch Plant.
January 17, 1996	GCL conducted the first quarter 1996 sampling event at Linam Ranch Plant.
April 24, 1996	GCL conducted the annual (second quarter 1996) sampling event at Linam Ranch Plant. The annual report included recommendations to the OCD for continued monitoring on a semi-annual basis.

January 22, 1997	BDM International, Inc. (formerly GCL) conducted the semi-annual (first quarter 1997) sampling event.
February 5, 1997	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
August 15, 1997	BDM International, Inc. (BDM) conducted the third quarter 1997 (annual) sampling event.
December 11, 1997	GPM submitted the 1997 Annual Groundwater Monitoring and Sampling Report to the OCD.
January 22, 1998	BDM, a wholly owned subsidiary of TRW, conducted the semi-annual (first quarter 1998) sampling event.
March 25, 1998	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
July 22, 1998	TRW conducted the third quarter 1998 (annual) sampling event.
December 4, 1998	GPM submitted the 1998 Annual Groundwater Monitoring and Sampling Report to the OCD.
February 9, 1999	TRW conducted the semi-annual (first quarter 1999) sampling event.
February 10, 1999	GPM submitted a request to revise the monitoring plan to the OCD. The request proposed additional downgradient monitoring in the area of the EOTT tanks (MW-3) in lieu of installing additional wells. The request also proposed expanding the monitoring program to include semi-annual sampling of monitoring wells in the vicinity of the former liquid waste disposal area.
March 19, 1999	The OCD approved GPM's proposed request to revise the monitoring plan.
August 24-25, 1999	TRW conducted the annual (third quarter 1999) sampling event.
October 26, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.
November 22, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.
December 20, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.
January 26, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.

February 22-23, 2000	TRW conducted the semi-annual (first quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and the absorbent sock in MW-6 was removed.
April 4, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and gauge the product thickness in MW-4 and MW-6.
April 24, 2000	TRW conducted a site visit to empty the passive bailer in MW-4, gauge the product thickness in MW-4 and MW-6, and install a new absorbent sock in MW-6.
June 15, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, and replace the absorbent sock in MW-6.
July 12, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, and check the absorbent sock in MW-6. Product from the sock in MW-6 was squeezed out and returned to the well.
August 17-18, 2000	TRW conducted the annual (third quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and replaced with an absorbent sock. The absorbent sock in MW-6 was checked and replaced.
October 2, 2000	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
December 14, 2000	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
January 23, 2001	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
February 6-7, 2001	TRW conducted the semi-annual (first quarter 2001) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and/or replaced.
March 21, 2001	TRW conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
May 1, 2001	Trident Environmental acquired the Midland Texas resources of TRW, Inc.

May 16, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
June 19, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
July 20, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
August 2-3, 2001	Trident conducted the annual (third quarter 2001) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The absorbent socks in MW-4 and MW-6 were checked and replaced.
September 11, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.
October 9, 2001	Trident conducted a site visit to gauge the product thickness and check and/or replace the absorbent socks in MW-4 and MW-6.

3.0 Procedures

During each sampling event, all on-site monitoring wells were gauged for depth to groundwater using a Solinst Model 101 water level indicator with the exception of MW-4 and MW-6, which were gauged using a Heron Model H.01L electronic water/product interface probe. During the both February 2001 and August 2001 sampling events all of the monitoring wells, except MW-4 and MW-6 (due to presence of LNAPL) were sampled. Immediately prior to collecting groundwater samples, a minimum of three well volumes was purged using a decontaminated 2-inch diameter submersible pump, or were purged by hand using a decontaminated PVC bailer. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen (DO) were measured during and after purging using a Hanna Model 9143 DO/temperature meter and a Horiba Model U-10 pH, conductivity, and temperature meter. Groundwater samples were collected after these parameters stabilized. A total of 400 gallons of water was purged from monitoring wells during the two 2001 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 benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. 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. The annual sampling event conducted on August 2 and 3, 2001, included a third and fourth set of water samples that were transferred into appropriately preserved containers for analysis of chlorides and total dissolved solids (TDS) and WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver). Samples for metals analysis were filtered in the field with a 45mm element. A summary of purging and sampling methods is provided on Table 1. 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-1	02/07/01	Pump	5	Disposable bailer	BTEX and Bio-indicators
	08/02/01	Pump	15	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-2	02/07/01	Pump	4	Disposable bailer	BTEX and Bio-indicators
	08/02/01	Pump	6	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-3	02/07/01	Pump	5	Disposable bailer	BTEX and Bio-indicators
	08/02/01	Pump	15	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-5	02/07/01	Pump	12	Disposable bailer	BTEX and Bio-indicators
	08/03/01	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-7	02/07/01	Bailer	3	Disposable bailer	BTEX and Bio-indicators
	08/02/01	Bailer	1	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-8	02/07/01	Pump	25	Disposable bailer	BTEX and Bio-indicators
	08/02/01	Pump	40	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-9	02/07/01	Pump	5	Disposable bailer	BTEX and Bio-indicators
	08/02/01	Pump	12	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10	02/07/01	Pump	25	Disposable bailer	BTEX and Bio-indicators
	08/03/01	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10D	02/07/01	Pump	15	Disposable bailer	BTEX and Bio-indicators
	08/03/01	Pump	15	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-11	02/07/01	Pump	20	Disposable bailer	BTEX and Bio-indicators
	08/03/01	Pump	30	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-12	02/07/01	Pump	16	Disposable bailer	BTEX and Bio-indicators
	08/02/01	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-13	02/07/01	Pump	20	Disposable bailer	BTEX and Bio-indicators
	08/03/01	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators

BTEX - benzene, toluene, ethylbenzene, xylenes
WQCC Metals - Ag, Al, Cr, Fe, and Mn
Major ions - TDS, Cl, NO_3, and SO_4
Bio-indicators - DO, NO3, SO4
Monitoring wells MW-4 and MW-6 not sampled due to presence of free product.

4.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by Trident on August 2, 2001, the groundwater conditions at the Linam Ranch Plant are characterized below.

- The depth to the water table is approximately 48 feet below ground surface in the site area.
- The hydraulic gradient is approximately 0.001 feet/foot, across the entire property with a maximum gradient of 0.0025 feet/foot.
- The direction of groundwater flow is to the southeast.
- The water table elevation has decreased an average of 0.67 feet across the site since August 2000.

The direction of groundwater flow and hydraulic gradient has remained consistent for the past five and a half years, however the groundwater elevations have steadily decreased at the rate of approximately 0.2 feet per year during this time. Historical groundwater elevations and depth to water measurements are summarized on Table 2, and depicted graphically in Figure 1. Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the two year 2001 sampling events are presented in Figure 2A (February 6, 2001) and Figure 2B (August 2, 2001).

Table 2
Summary of Groundwater Elevations
Linam Ranch Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-1	05/22/94	3718.29	3720.18	43.90	3676.28	0.00
	05/17/95	3718.29	3720.18	45.50	3674.68	0.00
	01/17/96	3718.29	3720.18	43.95	3676.23	0.00
	04/24/96	3718.29	3720.18	44.81	3675.37	0.00
	01/22/97	3718.29	3720.18	45.73	3674.45	0.00
	08/15/97	3718.29	3720.18	45.55	3674.63	0.00
	01/22/98	3718.29	3720.18	45.99	3674.19	0.00
	07/20/98	3718.29	3720.18	46.51	3673.67	0.00
	02/09/99	3718.29	3720.18	46.42	3673.76	0.00
	08/24/99	3718.29	3720.18	44.97	3675.21	0.00
	02/21/00	3718.29	3720.18	44.77	3675.41	0.00
	08/17/00	3718.29	3720.18	43.47	3676.71	0.00
	02/06/01	3718.29	3720.18	43.19	3676.99	0.00
	08/02/01	3718.29	3720.18	45.37	3674.81	0.00
MW-2	05/22/94	3714.80	3717.24	34.95	3682.29	0.00
	05/17/95	3714.80	3717.24	43.75	3673.49	0.00
	01/22/97	3714.80	3717.24	44.05	3673.19	0.00
	01/22/98	3714.80	3717.24	44.44	3672.80	0.00
	07/20/98	3714.80	3717.24	44.87	3672.37	0.00
	02/09/99	3714.80	3717.24	44.83	3672.41	0.00
	08/24/99	3714.80	3717.24	42.81	3674.43	0.00
	02/21/00	3714.80	3717.24	44.56	3672.68	0.00
	08/17/00	3714.80	3717.24	37.81	3679.43	0.00
	02/06/01	3714.80	3717.24	43.19	3674.05	0.00
	08/02/01	3714.80	3717.24	44.55	3672.69	0.00
MW-3	05/22/94	3715.50	3717.70	46.23	3671.47	0.00
	05/17/95	3715.50	3717.70	46.98	3670.72	0.00
	11/14/95	3715.50	3717.70	46.40	3671.30	0.00
	04/24/96	3715.50	3717.70	46.57	3671.13	0.00
	01/22/97	3715.50	3717.70	47.23	3670.47	0.00
	01/22/98	3715.50	3717.70	47.74	3669.96	0.00
	07/20/98	3715.50	3717.70	47.90	3669.80	0.00
	02/09/99	3715.50	3717.70	48.11	3669.59	0.00
	08/24/99	3715.50	3717.70	48.02	3669.68	0.00
	02/21/00	3715.50	3717.70	48.19	3669.51	0.00
	08/17/00	3715.50	3717.70	48.02	3669.68	0.00
	02/06/01	3715.50	3717.70	48.22	3669.48	0.00
	08/02/01	3715.50	3717.70	48.39	3669.31	0.00
MW-4	12/01/92	3720.46	3722.45	45.35	3677.10	0.00
	05/22/94	3720.46	3722.45	45.49	3676.96	0.00
	05/17/95	3720.46	3722.45	47.20	3675.43	0.22
	11/15/95	3720.46	3722.45	46.71	3675.75	0.01

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

Table 2 (continued)
Summary of Groundwater Elevations
Linam Ranch Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-4 (con't)	01/17/96	3720.46	3722.45	46.18	3676.27	0.00
	04/24/96	3720.46	3722.45	46.95	3675.50	0.00
	01/22/97	3720.46	3722.45	48.19	3674.29	0.04
	08/15/97	3720.46	3722.45	48.55	3674.12	0.27
	01/22/98	3720.46	3722.45	49.11	3674.52	1.44
	07/20/98	3720.46	3722.45	48.99	3673.76	0.36
	02/09/99	3720.46	3722.45	48.11	3674.45	0.13
	08/24/99	3720.46	3722.45	47.73	3675.44	0.88
	02/21/00	3720.46	3722.45	46.66	3675.81	0.03
	08/17/00	3720.46	3722.45	46.39	3676.07	0.01
	02/06/01	3720.46	3722.45	47.06	3675.39	0.01
	08/02/01	3720.46	3722.45	47.66	3674.79	0.01
MW-5	12/01/92	3721.53	3723.60	45.95	3677.65	0.00
	05/22/94	3721.53	3723.60	46.27	3677.33	0.00
	05/17/95	3721.53	3723.60	48.17	3675.43	0.01
	11/15/95	3721.53	3723.60	46.98	3676.62	0.00
	01/17/96	3721.53	3723.60	47.37	3676.23	0.00
	04/24/96	3721.53	3723.60	48.09	3675.51	0.00
	01/22/97	3721.53	3723.60	49.25	3674.35	0.00
	08/15/97	3721.53	3723.60	49.64	3673.96	0.00
	01/22/98	3721.53	3723.60	48.86	3674.74	0.00
	07/20/98	3721.53	3723.60	49.39	3674.21	0.00
	02/09/99	3721.53	3723.60	48.76	3674.84	0.00
	08/24/99	3721.53	3723.60	48.13	3675.47	0.00
	02/21/00	3721.53	3723.60	47.76	3675.84	0.00
	08/17/00	3721.53	3723.60	47.94	3675.66	0.00
	02/06/01	3721.53	3723.60	48.36	3675.24	0.00
	08/02/01	3721.53	3723.60	48.78	3674.82	0.00
MW-6	12/01/92	3720.99	3723.08	46.21	3676.87	0.00
	05/22/94	3720.99	3723.08	46.38	3676.70	0.00
	05/17/95	3720.99	3723.08	48.25	3674.87	0.05
	11/15/95	3720.99	3723.08	46.29	3676.80	0.01
	01/17/96	3720.99	3723.08	46.90	3676.18	0.00
	04/24/96	3720.99	3723.08	46.72	3676.37	0.01
	01/22/97	3720.99	3723.08	48.89	3674.21	0.02
	08/15/97	3720.99	3723.08	49.21	3673.91	0.05
	01/22/98	3720.99	3723.08	48.91	3674.21	0.05
	07/20/98	3720.99	3723.08	49.56	3673.59	0.08
	02/09/99	3720.99	3723.08	49.24	3673.84	0.00
	08/24/99	3720.99	3723.08	48.22	3674.86	0.00
	02/21/00	3720.99	3723.08	47.97	3675.11	0.00
	08/17/00	3720.99	3723.08	47.48	3675.61	0.01
	02/06/01	3720.99	3723.08	48.42	3674.66	0.11
	08/02/01	3720.99	3723.08	48.94	3674.14	0.01

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

Table 2 (continued)
Summary of Groundwater Elevations
Linam Ranch Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-7	05/22/94	3728.57	3730.84	54.52	3676.32	0.00
	05/17/95	3728.57	3730.84	57.00	3673.84	0.00
	11/14/95	3728.57	3730.84	57.95	3672.89	0.00
	04/24/96	3728.57	3730.84	58.00	3672.84	0.00
	01/22/97	3728.57	3730.84	57.71	3673.13	0.00
	01/22/98	3728.57	3730.84	57.57	3673.27	0.00
	02/09/99	3728.57	3730.84	57.29	3673.55	0.00
	08/24/99	3728.57	3730.84	57.64	3673.20	0.00
	02/21/00	3728.57	3730.84	57.39	3673.45	0.00
	08/17/00	3728.57	3730.84	57.26	3673.58	0.00
	02/06/01	3728.57	3730.84	56.66	3674.18	0.00
	08/02/01	3728.57	3730.84	58.15	3672.69	0.00
MW-8	05/22/94	3714.18	3716.18	41.35	3674.83	0.00
	05/17/95	3714.18	3716.18	43.45	3672.73	0.00
	01/17/96	3714.18	3716.18	41.71	3674.47	0.00
	04/24/96	3714.18	3716.18	42.82	3673.36	0.00
	01/22/97	3714.18	3716.18	43.40	3672.78	0.00
	08/15/97	3714.18	3716.18	44.14	3672.04	0.00
	01/22/98	3714.18	3716.18	44.31	3671.87	0.00
	07/20/98	3714.18	3716.18	44.57	3671.61	0.00
	02/09/99	3714.18	3716.18	44.70	3671.48	0.00
	08/24/99	3714.18	3716.18	43.62	3672.56	0.00
	02/21/00	3714.18	3716.18	44.25	3671.93	0.00
	08/17/00	3714.18	3716.18	41.52	3674.66	0.00
	02/06/01	3714.18	3716.18	43.58	3672.60	0.00
	08/02/01	3714.18	3716.18	44.92	3671.26	0.00
MW-9	05/22/94	3720.48	3722.48	49.59	3672.89	0.00
	05/17/95	3720.48	3722.48	50.60	3671.88	0.00
	11/14/95	3720.48	3722.48	50.02	3672.46	0.00
	01/17/96	3720.48	3722.48	49.84	3672.64	0.00
	04/24/96	3720.48	3722.48	50.08	3672.40	0.00
	02/07/97	3720.48	3722.48	50.96	3671.52	0.00
	08/15/97	3720.48	3722.48	51.34	3671.14	0.00
	01/22/98	3720.48	3722.48	51.48	3671.00	0.00
	07/20/98	3720.48	3722.48	51.58	3670.90	0.00
	02/09/99	3720.48	3722.48	51.81	3670.67	0.00
	08/24/99	3720.48	3722.48	51.59	3670.89	0.00
	02/21/00	3720.48	3722.48	51.70	3670.78	0.00
	08/17/00	3720.48	3722.48	51.56	3670.92	0.00
	02/06/01	3720.48	3722.48	51.62	3670.86	0.00
	08/02/01	3720.48	3722.48	51.86	3670.62	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

Table 2 (continued)
Summary of Groundwater Elevations
Linam Ranch Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-10	05/17/95	3720.76	3722.90	50.45	3672.45	0.00
	11/14/95	3720.76	3722.90	49.85	3673.05	0.00
	01/17/96	3720.76	3722.90	49.82	3673.08	0.00
	04/24/96	3720.76	3722.90	50.15	3672.75	0.00
	02/07/97	3720.76	3722.90	51.12	3671.78	0.00
	08/15/97	3720.76	3722.90	51.49	3671.41	0.00
	01/22/98	3720.76	3722.90	51.57	3671.33	0.00
	07/20/98	3720.76	3722.90	51.68	3671.22	0.00
	02/09/99	3720.76	3722.90	51.88	3671.02	0.00
	08/24/99	3720.76	3722.90	51.51	3671.39	0.00
	02/21/00	3720.76	3722.90	51.66	3671.24	0.00
	08/17/00	3720.76	3722.90	51.37	3671.53	0.00
	02/06/01	3720.76	3722.90	51.54	3671.36	0.00
	08/02/01	3720.76	3722.90	51.84	3671.06	0.00
MW-10D	05/17/95	3720.85	3723.54	51.38	3672.16	0.00
	11/14/95	3720.85	3723.54	50.63	3672.91	0.00
	01/17/96	3720.85	3723.54	50.73	3672.81	0.00
	04/24/96	3720.85	3723.54	51.18	3672.36	0.00
	02/07/97	3720.85	3723.54	52.11	3671.43	0.00
	08/15/97	3720.85	3723.54	52.47	3671.07	0.00
	01/22/98	3720.85	3723.54	52.41	3671.13	0.00
	07/20/98	3720.85	3723.54	52.55	3670.99	0.00
	02/09/99	3720.85	3723.54	52.76	3670.78	0.00
	08/24/99	3720.85	3723.54	52.51	3671.03	0.00
	02/21/00	3720.85	3723.54	52.56	3670.98	0.00
	08/17/00	3720.85	3723.54	52.25	3671.29	0.00
	02/06/01	3720.85	3723.54	52.57	3670.97	0.00
	08/02/01	3720.85	3723.54	52.78	3670.76	0.00
MW-11	05/17/95	3722.02	3724.53	51.50	3673.03	0.00
	11/14/95	3722.02	3724.53	50.34	3674.19	0.00
	01/17/96	3722.02	3724.53	50.65	3673.88	0.00
	04/24/96	3722.02	3724.53	51.22	3673.31	0.00
	02/07/97	3722.02	3724.53	52.32	3672.21	0.00
	08/15/97	3722.02	3724.53	52.72	3671.81	0.00
	01/22/98	3722.02	3724.53	52.52	3672.01	0.00
	07/20/98	3722.02	3724.53	52.65	3671.88	0.00
	02/09/99	3722.02	3724.53	52.85	3671.68	0.00
	08/24/99	3722.02	3724.53	52.47	3672.06	0.00
	02/21/00	3722.02	3724.53	52.44	3672.09	0.00
	08/17/00	3722.02	3724.53	52.06	3672.47	0.00
	02/06/01	3722.02	3724.53	52.31	3672.22	0.00
	08/02/01	3722.02	3724.53	52.74	3671.79	0.00

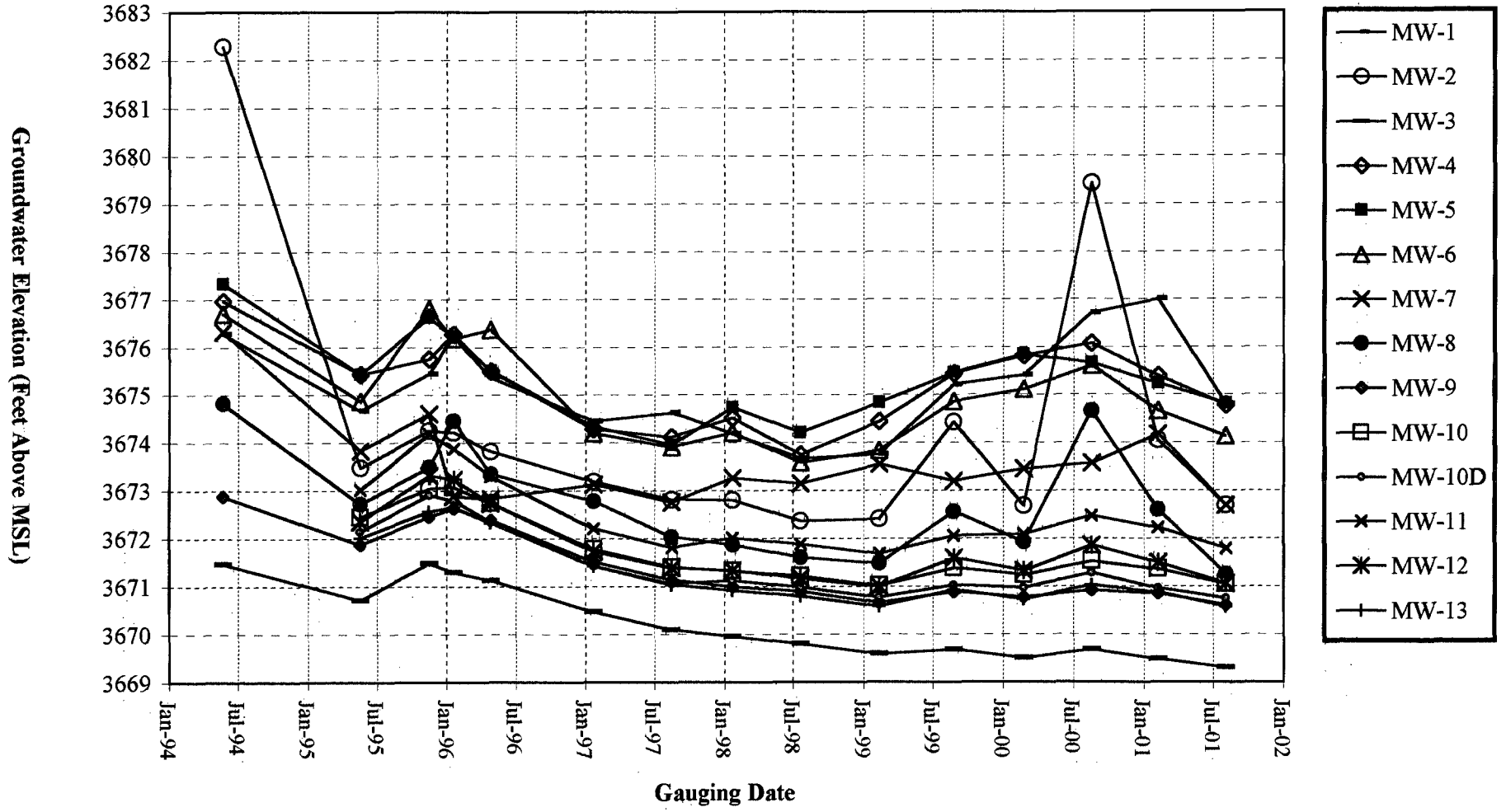
* Elevations surveyed by John W. West Engineering Company of Hobbs, NM.
The monitoring well casings were marked on the north side to provide consistent reference points for future gauging operations.
Groundwater direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

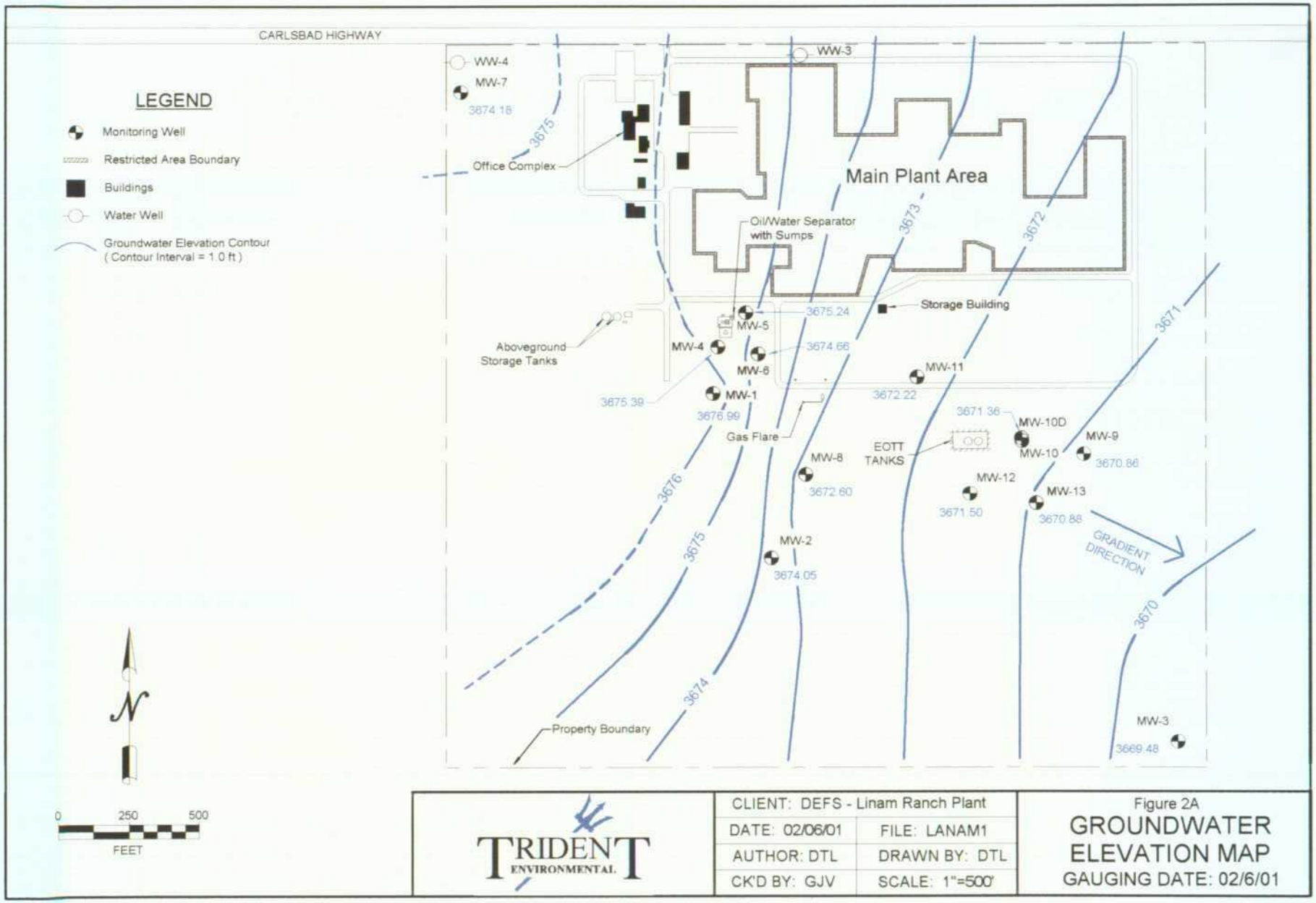
Table 2 (continued)
Summary of Groundwater Elevations
Linam Ranch Plant

Monitoring Well Number	Gauging Date	Ground Surface Elevations (Feet)	Top of Casing Elevations (Feet)	Groundwater Depth Below Top of Casing (Feet)	Groundwater Elevation (Feet)	LNAPL Thickness (Feet)
MW-12	05/17/95	3720.60	3722.84	50.47	3672.37	0.00
	11/14/95	3720.60	3722.84	49.52	3673.32	0.00
	01/17/96	3720.60	3722.84	49.59	3673.25	0.00
	04/24/96	3720.60	3722.84	50.09	3672.75	0.00
	02/07/97	3720.60	3722.84	51.10	3671.74	0.00
	08/15/97	3720.60	3722.84	51.44	3671.40	0.00
	01/22/98	3720.60	3722.84	51.50	3671.34	0.00
	07/20/98	3720.60	3722.84	51.66	3671.18	0.00
	02/09/99	3720.60	3722.84	51.84	3671.00	0.00
	08/24/99	3720.60	3722.84	51.25	3671.59	0.00
	02/21/00	3720.60	3722.84	51.51	3671.33	0.00
	08/17/00	3720.60	3722.84	50.98	3671.86	0.00
	02/06/01	3720.60	3722.84	51.34	3671.50	0.00
	08/02/01	3720.60	3722.84	51.77	3671.07	0.00
MW-13	05/17/95	3721.63	3723.99	51.97	3672.02	0.00
	11/14/95	3721.63	3723.99	51.42	3672.57	0.00
	01/17/96	3721.63	3723.99	51.33	3672.66	0.00
	04/24/96	3721.63	3723.99	51.65	3672.34	0.00
	02/07/97	3721.63	3723.99	52.56	3671.43	0.00
	08/15/97	3721.63	3723.99	52.94	3671.05	0.00
	01/22/98	3721.63	3723.99	53.06	3670.93	0.00
	07/20/98	3721.63	3723.99	53.19	3670.80	0.00
	02/09/99	3721.63	3723.99	53.39	3670.60	0.00
	08/24/99	3721.63	3723.99	53.05	3670.94	0.00
	02/21/00	3721.63	3723.99	53.25	3670.74	0.00
	08/17/00	3721.63	3723.99	52.95	3671.04	0.00
	02/06/01	3721.63	3723.99	53.11	3670.88	0.00
	08/02/01	3721.63	3723.99	53.41	3670.58	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.001 to 0.0025 feet/foot.

FIGURE 1
Groundwater Elevation Versus Time





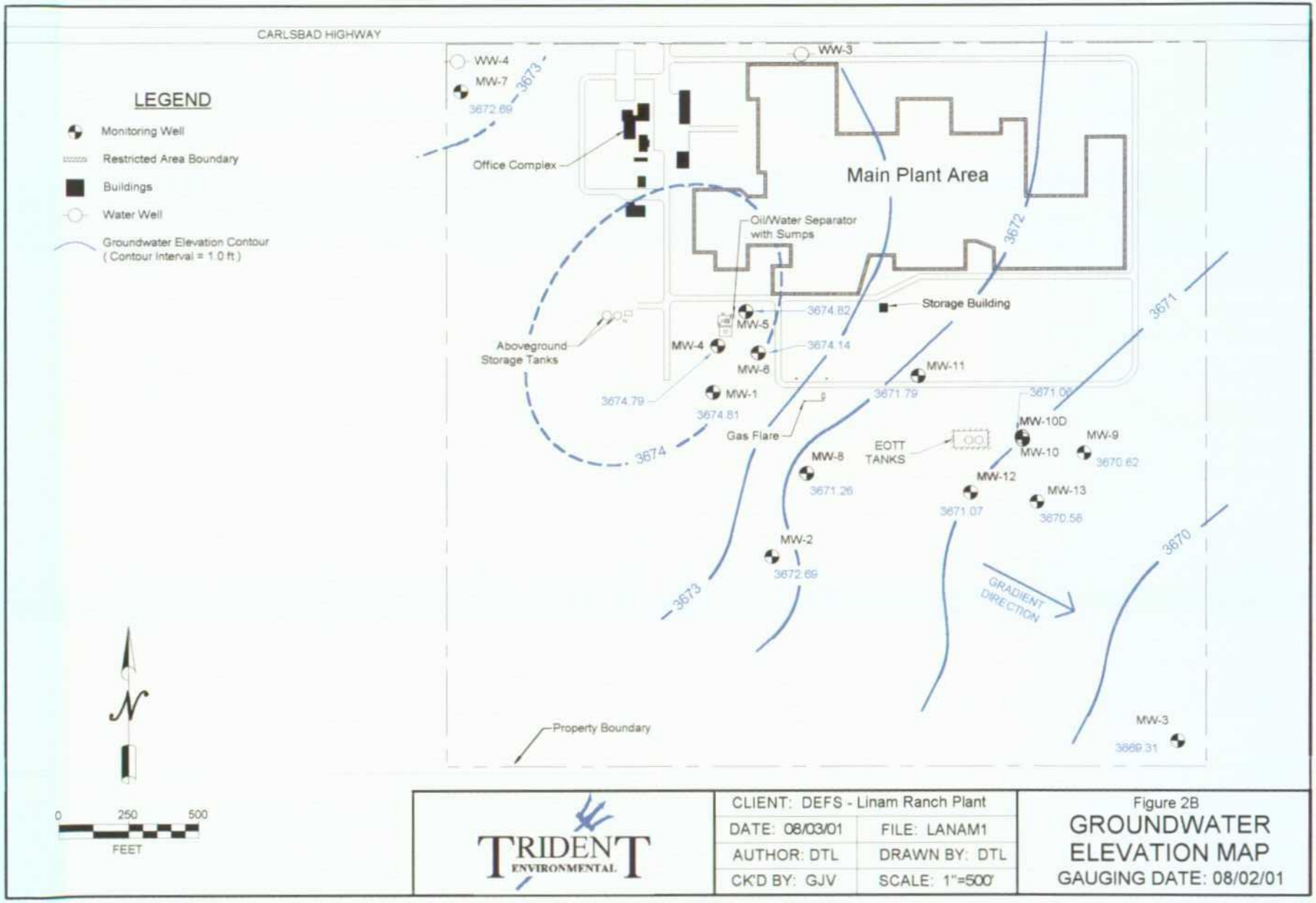
TRIDENT ENVIRONMENTAL

CLIENT: DEFS - Linam Ranch Plant	
DATE: 02/06/01	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: DTL
CK'D BY: GJV	SCALE: 1"=500'

Figure 2A

GROUNDWATER ELEVATION MAP

GAUGING DATE: 02/6/01



TRIDENT ENVIRONMENTAL

CLIENT: DEFS - Linam Ranch Plant	
DATE: 08/03/01	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: DTL
CK'D BY: GJV	SCALE: 1"=500'

Figure 2B
GROUNDWATER ELEVATION MAP
GAUGING DATE: 08/02/01

5.0 Groundwater Quality Conditions

5.1 Distribution of Hydrocarbons in Groundwater

A historical listing of benzene, toluene, ethylbenzene and xylene (BTEX) concentrations obtained from the on site monitoring wells is summarized in Table 3. Figures 3 (A through F) graphically depict the BTEX concentrations in groundwater and the groundwater elevations versus time (monitoring period) for monitoring wells MW-5, MW-9, MW-10, MW-10D, MW-11, and MW-13, respectively. Hydrocarbon concentration maps depicting the BTEX concentrations for the two 2001 sampling events are presented in Figure 4A (February 7-8, 2001) and Figure 4B (August 2-3, 2001). Based on the analytical results, the distribution of hydrocarbons at the Linam Ranch Plant is described below.

- BTEX concentrations in monitoring wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-10D, MW-11, MW-12 and MW-13 were below the New Mexico WQCC standards for each constituent.

- Benzene levels in MW-9 (0.038 mg/L) and MW-10 (1.64 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells. Although benzene concentrations in MW-9 (located downgradient from the EOTT tank area) increased from August 1999 to August 2000 they now appear to have stabilized. The concentrations in all of the other measured hydrocarbon constituents have remained below the laboratory detection levels.

- Dissolved hydrocarbon concentrations in MW-10 (located near the EOTT tank source area) and MW-10D (deeper completed twin to MW-10) have remained stable to decreasing since monitoring began in 1995.

- Dissolved hydrocarbon concentrations in MW-11 (located upgradient from the EOTT tank source area) have also decreased since monitoring began in 1995 and now appear be stabilizing at or below the WQCC standard levels.

- Benzene concentrations in MW-13 (located downgradient from the EOTT tank area) have decreased to below the WQCC standard level for the first time since April of 1996. The concentrations in all of the other measured hydrocarbon constituents have remained at or below the laboratory detection levels. It is suspected that the elevated levels of dissolved benzene in MW-13 from January 1996 to February 2001 indicate a downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-10 during the April 24, 1996 sampling event. Preliminary estimates, based on the maximum benzene levels observed in each well indicate that the benzene slug is migrating at approximately 0.49 feet per day and attenuating at a rate of approximately one half-life per 40 feet. At this rate the benzene slug should not represent an environmental threat to potential future receptors within 160 feet southwest of MW-13.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

Table 3
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	09/20/91	0.0053	0.0067	0.001	<0.001
	11/03/92	0.0015	0.0015	<0.001	0.010
	12/02/92	0.0013	0.0014	<0.001	0.006
	01/12/94	0.0039	<0.001	0.0021	0.002
	05/17/95	<0.002	<0.002	<0.002	<0.002
	08/25/99	<0.005	<0.005	<0.005	0.006
	02/22/00	<0.005	<0.005	<0.005	0.006
	08/18/00	<0.001	<0.001	<0.001	0.011
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.003	<0.001	<0.001	<0.001
MW-2	09/20/91	<0.001	<0.001	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	<0.001	<0.001	<0.001	<0.001
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.007	<0.001	<0.001	<0.001
MW-3	09/20/91	<0.001	0.0021	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	02/09/99	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/17/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	0.002	<0.001	<0.001	<0.001
MW-4	11/03/92	**16.0**	**8.0**	0.7	**1.8**
	12/02/92	**17.0**	**8.2**	0.53	**1.3**
	01/10/94	**18.0**	**10.0**	0.5	**1.3**
	05/17/95	**20.9**	**1.35**	<0.2	**11.4**
MW-5	11/03/92	0.003	0.0034	0.003	0.034
	12/02/92	0.0091	0.0041	0.0082	0.037
	01/10/94	**0.300**	0.190	0.160	0.490
	05/17/95	**0.090**	0.014	0.138	**0.831**
	08/25/99	**0.137**	0.037	0.262	0.179
	02/23/00	**0.068**	<0.005	0.13	0.09
	08/18/00	<0.005	<0.005	0.006	0.008
	02/08/01	<0.005	<0.005	0.084	<0.005
	08/03/01	<0.005	<0.005	<0.005	<0.005
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 8021 except for samples obtained on May 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 3 (continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-6	11/03/92	**0.340**	0.023	0.051	0.120
	12/02/92	**0.520**	0.020	0.058	0.120
	01/10/94	**0.770**	0.0029	0.096	0.210
	05/17/95	**0.980**	0.007	0.087	0.181
MW-7	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/17/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	<0.005	<0.005	<0.005	<0.005
MW-8	02/09/94	<0.001	<0.005	<0.005	<0.005
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	0.002	<0.001	<0.001	<0.001
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	<0.001	<0.001	<0.001	<0.001
MW-9	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	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
	08/15/97	<0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/20/98	<0.001	<0.001	<0.001	<0.001
	02/09/99	**0.011**	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	**0.014**	<0.005	<0.005	<0.005
	08/18/00	**0.036**	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/02/01	**0.038**	<0.001	<0.001	<0.001
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 8021 except for samples obtained on May 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 3 (continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-10	05/17/95	**3.225**	0.052	0.049	0.169
	11/14/95	**5.230**	0.001	<0.001	0.406
	01/17/96	**6.110**	**0.863**	**1.140**	**1.050**
	04/24/96	**6.940**	<0.010	**1.190**	0.127
	01/22/97	**6.41**	**1.63**	0.294	**8.97**
	08/15/97	**5.63**	**1.35**	0.479	**0.453**
	01/22/98	**7.03**	**1.93**	**0.802**	**0.635**
	07/22/98	**7.18**	**2.34**	**0.777**	0.606
	02/09/99	**4.87**	0.32	0.516	0.372
	08/25/99	**5.58**	0.658	0.557	0.359
	02/23/00	**2.35**	0.129	0.164	0.124
	08/18/00	**3.11**	0.025	0.072	0.038
	02/08/01	**1.23**	0.082	0.102	0.086
	08/03/01	**1.64**	<0.02	0.119	<0.02
MW-10D	05/17/95	**0.096**	0.004	<0.001	0.008
	11/14/95	**0.125**	0.001	<0.001	0.011
	01/17/96	**0.841**	0.001	<0.001	0.047
	04/24/96	**8.140**	0.046	**1.170**	0.076
	01/22/97	**0.365**	<0.005	<0.005	<0.005
	08/15/97	**0.221**	<0.01	<0.01	<0.01
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	**0.184**	0.014	0.008	0.006
	02/09/99	0.009	<0.005	<0.005	<0.005
	08/25/99	**0.036**	<0.001	0.001	0.002
	02/23/00	**0.014**	<0.005	<0.005	<0.005
	08/18/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.005	<0.005	<0.005	<0.005
	08/03/01	<0.001	<0.001	<0.001	<0.001
MW-11	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	**0.306**	<0.001	<0.001	0.013
	01/17/96	**0.549**	0.004	0.002	0.031
	04/24/96	**0.520**	<0.002	<0.002	<0.002
	01/22/97	**0.267**	<0.001	<0.001	0.017
	08/15/97	**0.164**	<0.001	0.002	0.007
	01/22/98	**0.291**	0.004	<0.001	0.015
	07/22/98	**0.061**	<0.001	<0.001	0.010
	02/09/99	**0.018**	<0.001	<0.001	<0.001
	08/24/99	0.005	<0.001	<0.001	<0.001
	02/23/00	**0.02**	<0.001	0.002	0.008
	08/18/00	0.009	<0.005	<0.005	<0.005
	02/07/01	**0.013**	<0.001	<0.001	<0.001
	08/03/01	0.002	<0.001	<0.001	<0.001
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 8021 except for samples obtained on May 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 3 (continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-12	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	<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
	08/15/97	0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	0.002	<0.001	<0.001	<0.001
	02/09/99	0.001	<0.001	<0.001	<0.001
	08/24/99	0.003	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/18/00	<0.005	<0.005	<0.005	<0.005
	02/07/01	<0.001	<0.001	<0.001	<0.001
	08/03/01	<0.001	<0.001	<0.001	<0.001
MW-13	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	0.003	<0.001	0.001	<0.001
	01/17/96	<0.001	<0.001	<0.001	<0.001
	04/24/96	<0.001	<0.001	<0.001	<0.001
	01/22/97	**0.048**	<0.001	<0.001	<0.001
	08/15/97	**0.132**	<0.001	<0.001	0.01
	01/22/98	**0.082**	<0.001	<0.001	<0.001
	07/20/98	**0.061**	<0.001	<0.001	<0.001
	02/09/99	**0.082**	<0.001	<0.001	<0.001
	08/24/99	**0.062**	<0.001	<0.001	<0.001
	02/23/00	**0.08**	<0.001	<0.001	<0.001
	08/18/00	**0.04**	<0.005	<0.005	<0.005
	02/07/01	**0.023**	<0.005	<0.005	<0.005
	08/03/01	0.002	<0.001	<0.001	<0.001
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 8021 except for samples obtained on May 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Summary of Dissolved BTEX Concentrations For Duplicate, Rinsate, and Trip Blank Samples

Sample Identification	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-13	02/07/01	0.023	< 0.005	< 0.005	< 0.005
Duplicate (MW-13)		0.032	< 0.001	< 0.001	< 0.001
Rinsate		< 0.001	< 0.001	< 0.001	< 0.001
MW-13	08/03/01	0.002	< 0.001	< 0.001	< 0.001
Duplicate (MW-13)		0.001	< 0.001	< 0.001	< 0.001
Rinsate		< 0.001	< 0.001	< 0.001	< 0.001
Trip Blank		< 0.001	< 0.001	< 0.001	< 0.001

All samples analyzed for BTEX by Trace Analysis, Inc. (Lubbock, Texas) using EPA Method 8021B.

FIGURE 3A
BTEX Concentration and Groundwater Elevation Versus Time (MW-5)

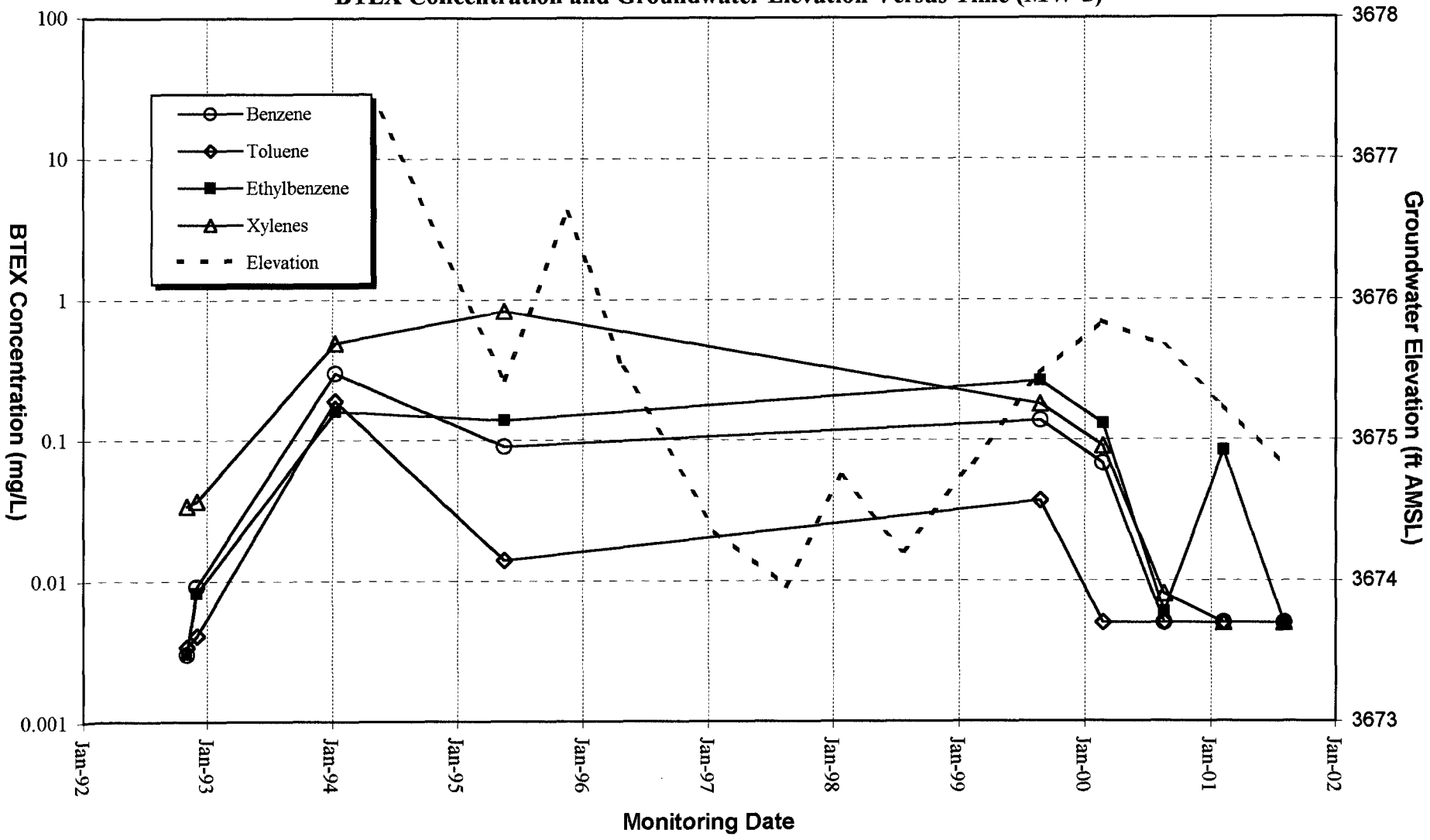


FIGURE 3B
BTEX Concentration and Groundwater Elevation Versus Time (MW-9)

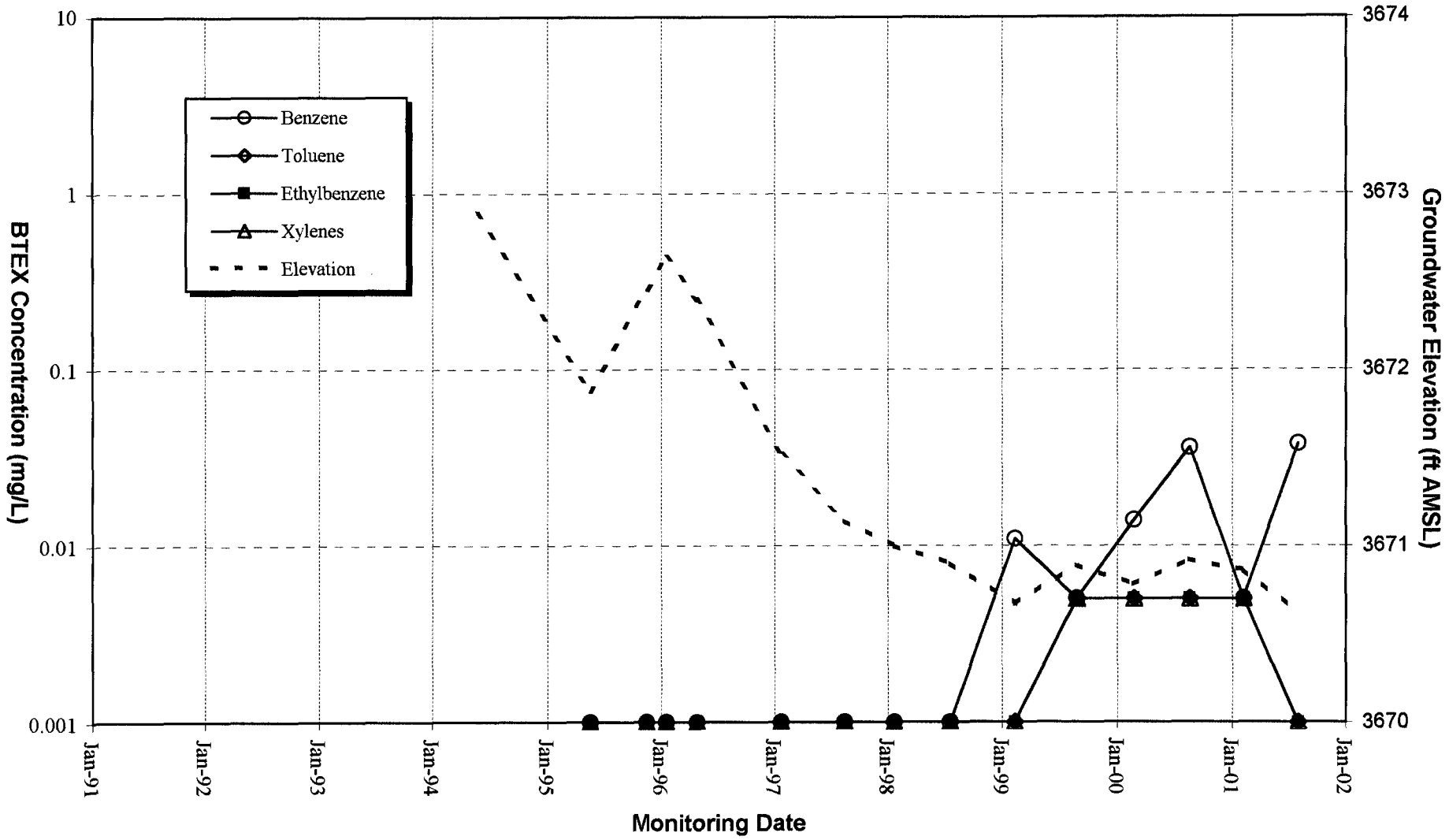


FIGURE 3C
BTEX Concentration and Groundwater Elevation Versus Time (MW-10)

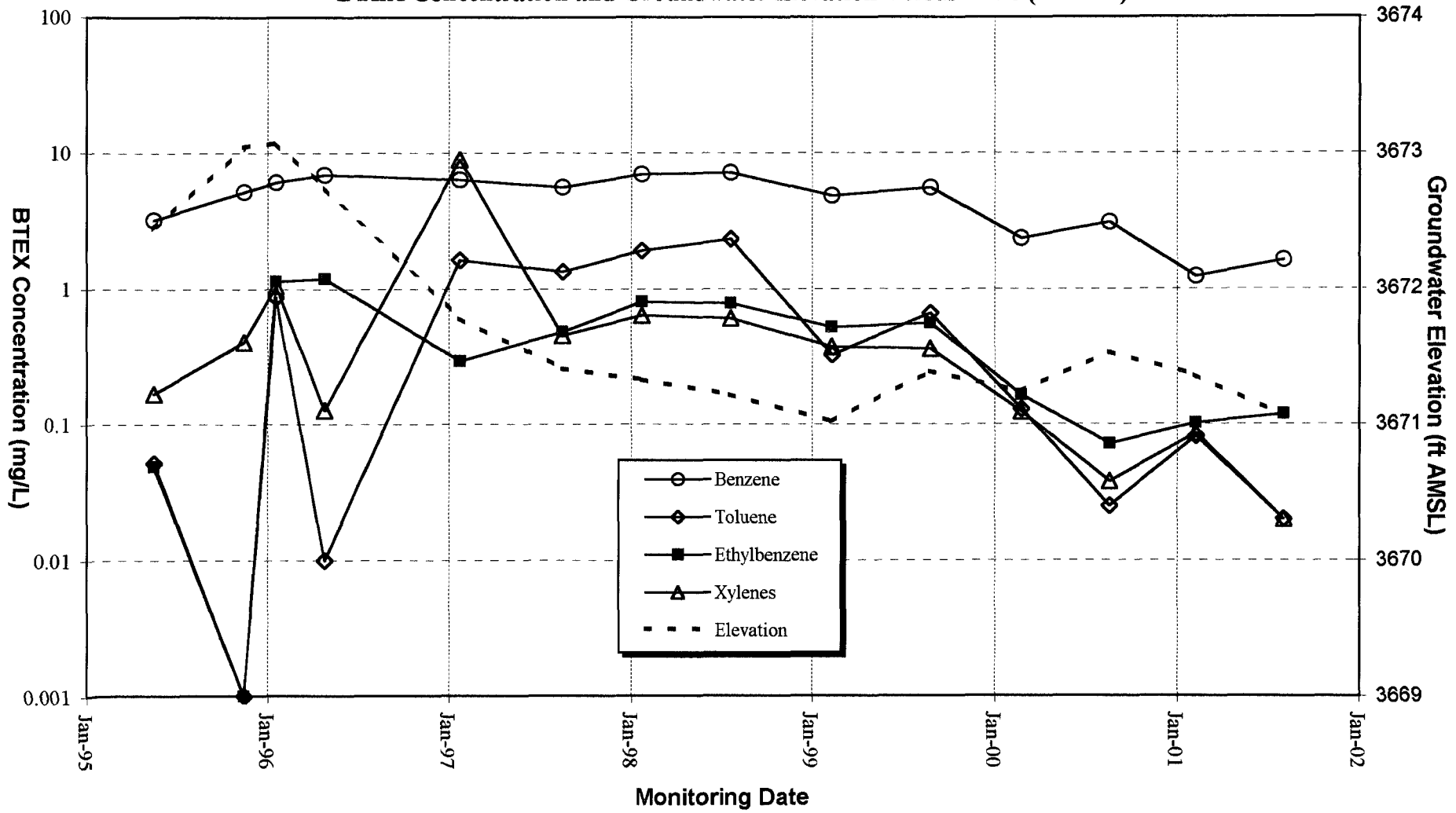


FIGURE 3D
BTEX Concentration and Groundwater Elevation Versus Time (MW-10D)

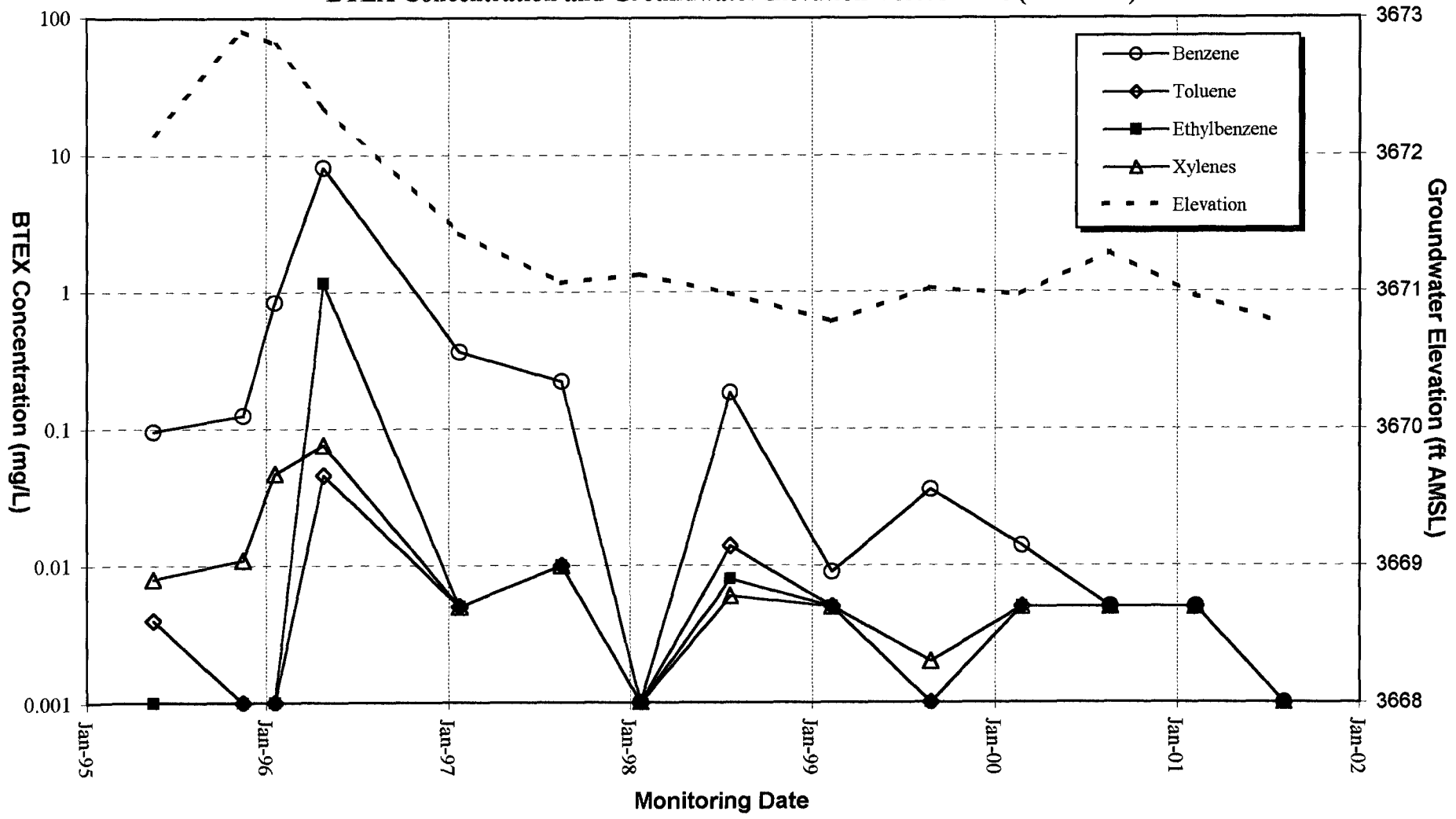


FIGURE 3E
BTEX Concentration and Groundwater Elevation Versus Time (MW-11)

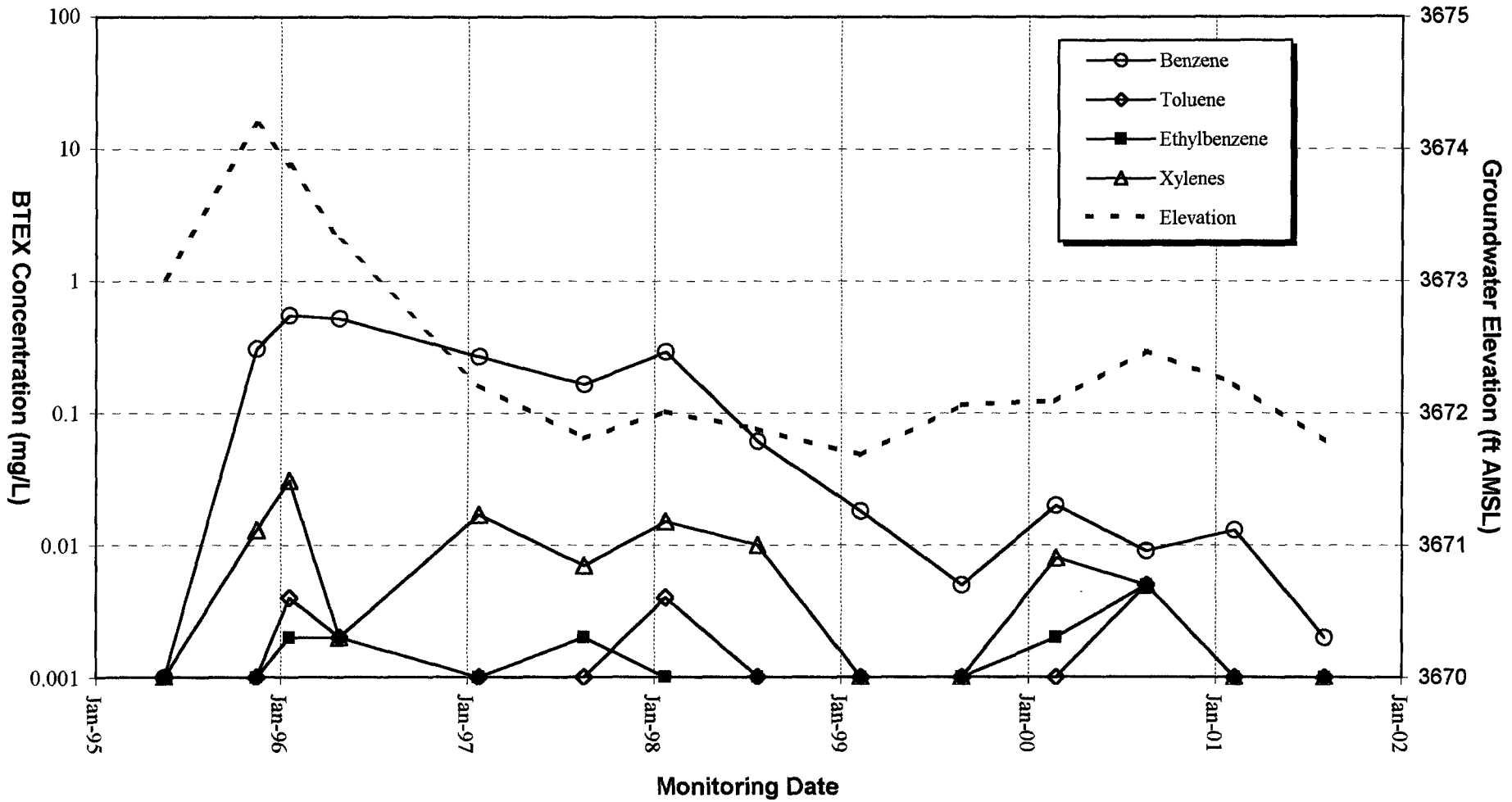
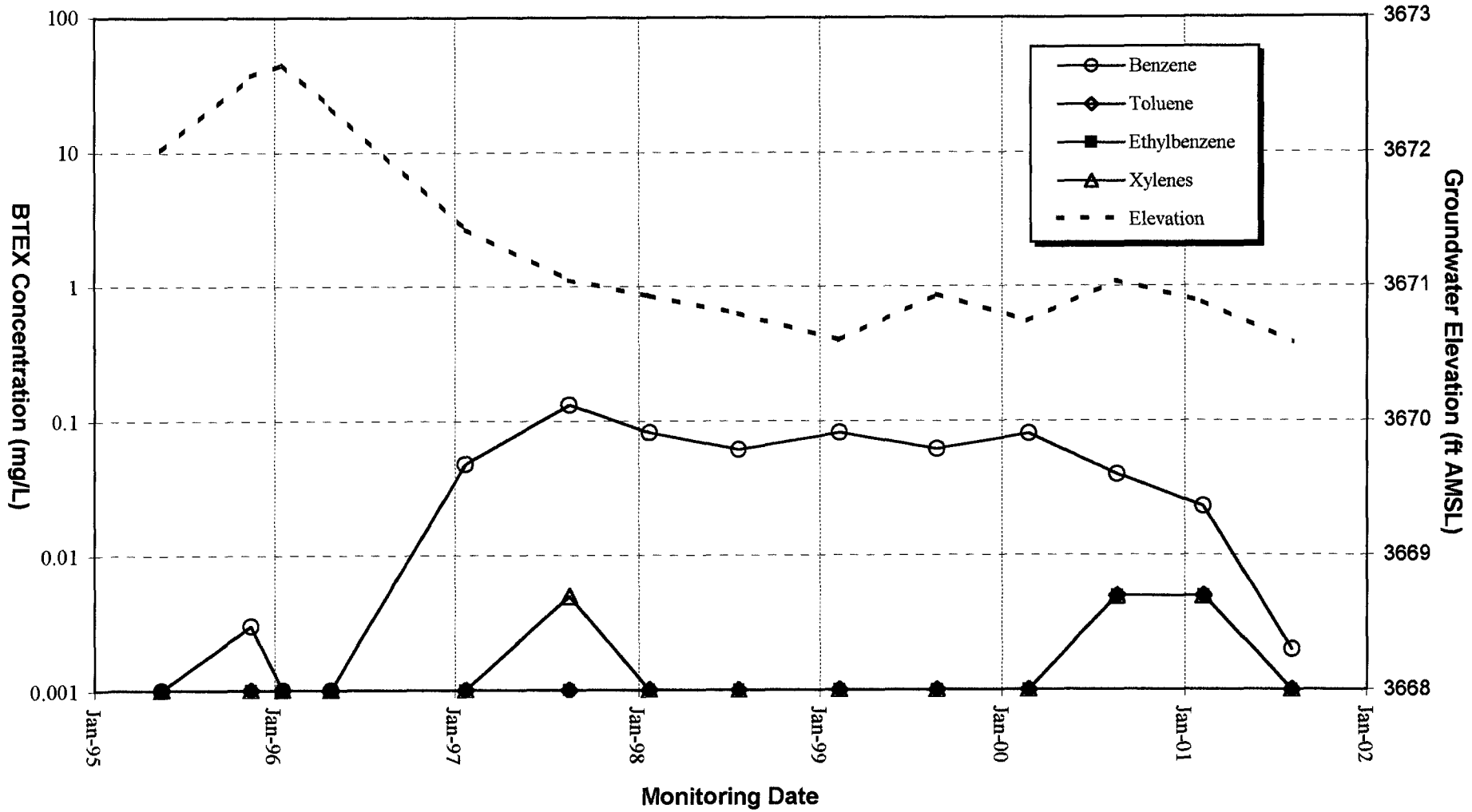
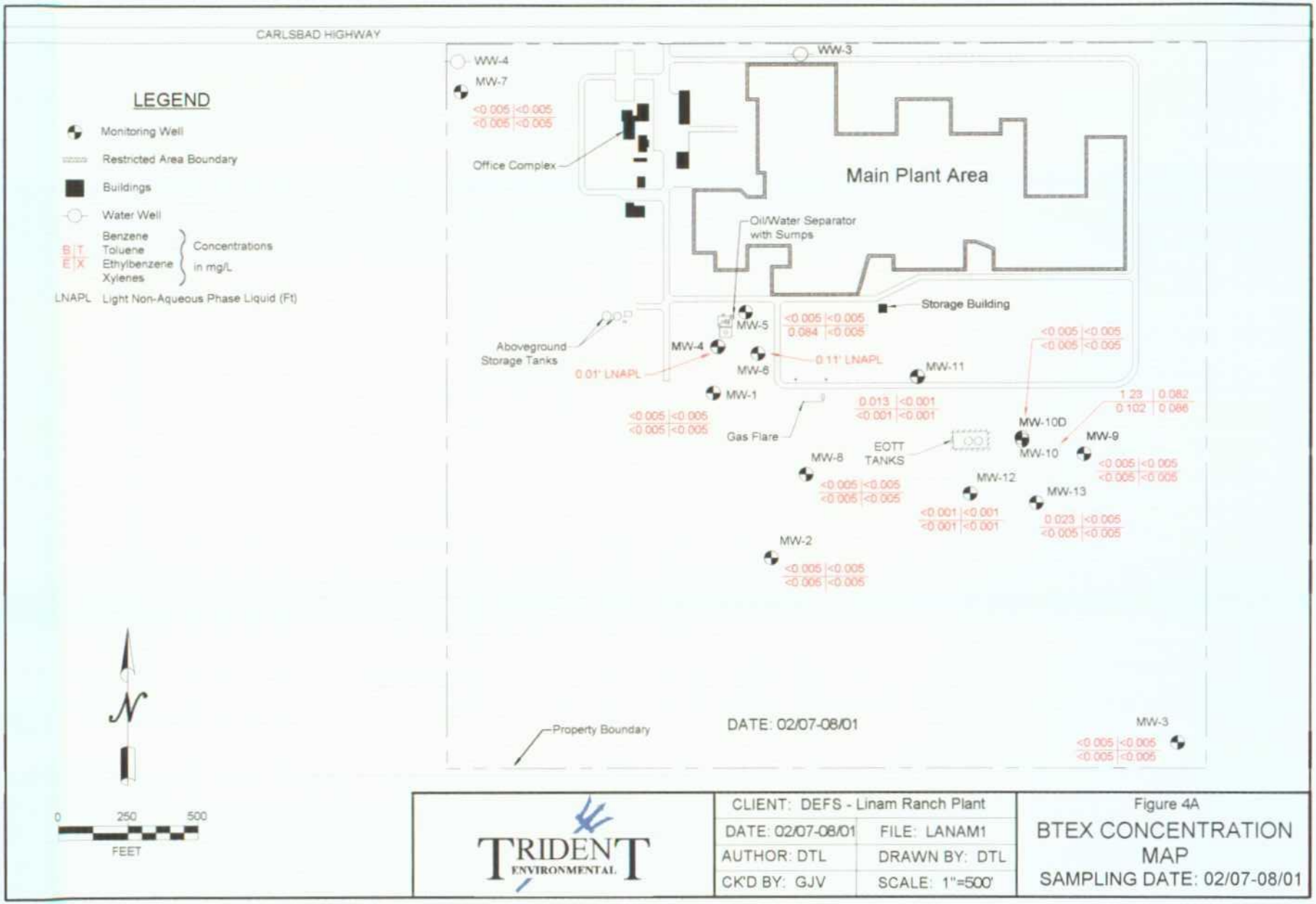


FIGURE 3F
BTEX Concentration and Groundwater Elevation Versus Time (MW-13)





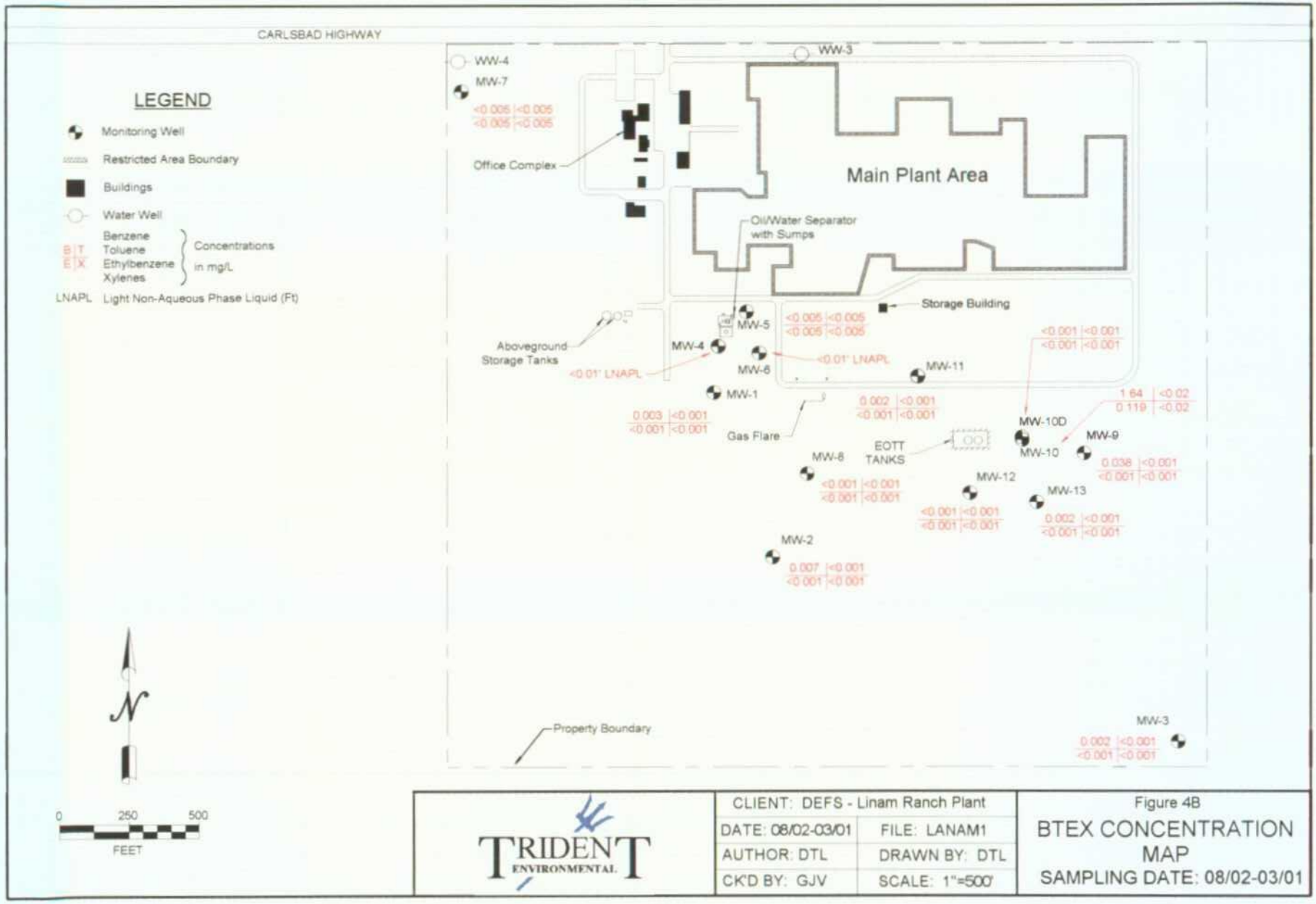
TRIDENT ENVIRONMENTAL

CLIENT: DEFS - Linam Ranch Plant	
DATE: 02/07-08/01	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: DTL
CK'D BY: GJV	SCALE: 1"=500'

Figure 4A

BTEX CONCENTRATION MAP

SAMPLING DATE: 02/07-08/01



TRIDENT ENVIRONMENTAL

CLIENT: DEFS - Linam Ranch Plant	
DATE: 08/02-03/01	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: DTL
CK'D BY: GJV	SCALE: 1"=500'

Figure 4B

BTEX CONCENTRATION MAP

SAMPLING DATE: 08/02-03/01

5.2 Distribution of WQCC Metals and Ions in Groundwater

Historical groundwater sample analytical results for WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver) and selected ions (chloride, nitrate, sulfate, and TDS) are presented in Table 4. The WQCC standards are also listed in the table 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.

During the 2001 annual sampling event, no constituents exceeded the WQCC standards for metals with the exception of manganese in MW-5 (1.11 mg/L), MW-10 (0.48 mg/L), and MW-10D (0.48 mg/L). The elevated levels of manganese appear to 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 resulting in higher concentrations. Aluminum, barium, cadmium, chromium, and silver concentrations have been well below WQCC standards for each monitoring well during more than five years of monitoring. Based on the results of the metal analyses during the annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals.

During the 2001 annual sampling event, arsenic concentrations were below WQCC standards (0.1 mg/L) and below the laboratory detection limit (0.05 mg/L) for all monitoring wells with the exception of MW-1 (0.197 mg/L). Other than natural conditions, there is no known source that explains the occurrence of arsenic in MW-1.

Analyses of chlorides and total dissolved solids (TDS) during the annual 2001 sampling event indicate no constituents exceeded the WQCC standards with the exception of TDS in monitoring wells MW-1 (1,120 mg/L), MW-5 (2,200 mg/L), MW-10 (1,190 mg/L) MW-10D (1,180 mg/L) and MW-13 (1,410 mg/L). The TDS concentrations identified slightly above the WQCC standards of 1,000 mg/L do not represent a significant risk to human health or the environment.

Table 4
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-1	05/17/95	<0.01	**62.67**	**0.2**	0.8	**0.02**	**0.46**	**30.76**	**0.56**	188	**2,204**
	08/24/99	<0.01	<0.2	0.08	<0.05	<0.01	0.01	<0.05	**0.22**	110	**2,400**
	08/18/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	160	**2,700**
	08/02/01	<0.0125	0.286	**0.197**	<0.1	<0.025	<0.01	<0.05	0.194	80.6	**1,120**
MW-2	05/17/95	**0.77**	0.16	<0.1	0.41	<0.01	0.02	0.34	**0.41**	6	378
	08/24/99	<0.01	1.0	<0.05	0.13	**0.01**	0.01	0.73	0.03	31	290
	08/17/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	11	300
	08/02/01	<0.0125	0.262	<0.05	0.169	<0.025	<0.01	<0.05	<0.025	45.7	412
MW-3	05/17/95	**0.23**	**13.48**	<0.1	0.24	<0.01	0.04	**8.65**	**0.24**	13	328
	08/24/99	<0.01	0.35	<0.05	0.09	<0.01	<0.01	0.22	<0.01	16	280
	08/17/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	<0.05	<0.01	11	300
	08/02/01	<0.0125	0.265	<0.05	0.472	<0.025	<0.01	<0.05	<0.025	13.1	312
MW-4	05/17/95	<0.01	2.44	**0.2**	0.69	<0.01	<0.01	**12.33**	0.15	**934**	**2,211**
MW-5	05/17/95	<0.01	**5.65**	**0.1**	**4.1**	<0.01	<0.01	**8.34**	**0.49**	**254**	937
	08/24/99	<0.01	<0.2	<0.05	**2.5**	<0.01	<0.01	**6.4**	**0.53**	**320**	**1,300**
	08/18/00	<0.01	<0.2	0.05	0.17	<0.01	<0.01	<0.05	**0.77**	240	**1,600**
	08/03/01	<0.0125	0.317	0.0737	0.196	<0.025	<0.01	**16.8**	**1.11**	**250**	**2,200**
MW-6	05/17/95	<0.01	**11.43**	**0.2**	**1.25**	<0.01	<0.01	**19.66**	**0.25**	181	**1,001**
MW-7	05/17/95	<0.01	**38.16**	**0.1**	0.45	**0.01**	**0.07**	**18.28**	**0.22**	113	713
	08/24/99	<0.01	<0.2	<0.05	0.87	<0.01	<0.01	0.06	<0.01	97	650
	08/17/00	<0.01	<0.2	<0.05	0.07	<0.01	<0.01	<0.05	<0.01	98	630
	08/02/01	<0.0125	0.259	<0.05	<0.1	<0.025	<0.01	<0.05	<0.025	94.5	646
MW-8	05/17/95	<0.01	0.21	**0.2**	0.11	<0.01	<0.01	0.17	0.07	83	**1,366**
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	0.05	<0.01	25	350
	08/18/00	<0.01	<0.2	<0.05	0.19	<0.01	<0.01	<0.05	<0.01	9.4	290
	08/02/01	<0.0125	0.279	<0.05	0.153	<0.025	<0.01	<0.05	<0.025	21.5	400
MW-9	05/17/95	<0.01	**26.58**	<0.1	0.3	<0.01	**0.06**	**12.08**	0.15	73	602
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	<0.03	<0.01	58	579
	08/15/97	<0.01	0.5	NA	NA	NA	<0.05	0.91	<0.01	53	**1,600**
	07/22/98	<0.002	<0.01	NA	NA	NA	<0.01	0.07	<0.01	53	580
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	<0.05	<0.01	52	580
	08/18/00	<0.01	<0.2	<0.05	0.14	<0.01	<0.01	<0.05	0.02	57	600
	08/02/01	<0.0125	0.745	<0.05	0.473	<0.025	<0.01	0.197	<0.025	52.9	616
MW-10	05/17/95	<0.01	4.79	<0.1	0.18	<0.01	<0.01	**3.05**	**0.41**	98	903
	04/24/96	0.01	<0.2	NA	NA	NA	<0.01	0.26	**0.93**	72	909
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.01	0.61	**0.63**	120	**1,300**
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.002	**3.1**	**0.77**	67	820
	08/25/99	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	0.62	**0.69**	120	**1,200**
	08/18/00	<0.01	<0.2	<0.05	0.17	<0.01	<0.01	<0.05	**0.58**	100	**1,100**
	08/03/01	<0.0125	0.341	<0.05	0.507	<0.025	<0.01	0.492	**0.482**	106	**1,190**
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
NA indicates sample was analyzed for this constituent.

Table 4 (continued)
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-10D	05/17/95	<0.01	3.99	<0.1	0.17	**0.01**	0.02	**2.88**	**0.25**	59	707
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	0.22	0.17	72	861
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.39	**0.2**	78	910
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.01	0.6	0.15	82	690
	08/25/99	<0.01	0.2	<0.05	0.08	<0.01	<0.01	0.51	**0.28**	110	**1,000**
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	0.57	**0.38**	87	950
	08/03/01	<0.0125	0.26	<0.05	0.527	<0.025	<0.01	**1.19**	**0.477**	92.8	**1,180**
MW-11	05/17/95	<0.01	2.14	<0.1	0.1	<0.01	0.05	**1.34**	0.15	49	890
	04/24/96	0.02	<0.2	NA	NA	NA	<0.03	0.13	0.08	28	963
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.11	0.17	39	**1,200**
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.01	<0.05	0.09	31	**1,000**
	08/24/99	<0.01	<0.2	<0.05	0.08	<0.01	<0.01	<0.05	0.13	40	850
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	<0.05	0.16	44	830
	08/03/01	<0.0125	0.326	<0.05	0.514	<0.025	<0.01	<0.05	0.143	51.1	835
MW-12	05/17/95	<0.01	**5.35**	<0.1	0.13	<0.01	0.03	**2.8**	0.07	225	**1,128**
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	<0.03	<0.01	91	736
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.48	0.05	**320**	**1,600**
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.01	0.4	0.05	210	**1,100**
	08/24/99	<0.01	<0.2	<0.05	0.12	**0.03**	0.04	0.29	0.07	190	**1,300**
	08/18/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	0.31	0.03	130	990
	08/02/01	<0.0125	0.196	<0.05	0.481	<0.025	<0.01	<0.05	<0.025	118	996
MW-13	05/17/95	**0.18**	**14.08**	<0.1	0.59	<0.01	<0.01	**7.02**	0.11	137	629
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	<0.03	<0.01	96	667
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.24	0.01	190	930
	07/22/98	<0.002	0.36	NA	NA	NA	<0.01	0.34	0.01	97	800
	08/24/99	<0.01	<0.2	0.06	0.22	**0.04**	0.04	0.08	0.05	140	930
	08/18/00	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	<0.05	0.05	230	960
	08/03/01	<0.0125	0.302	<0.05	0.442	<0.025	<0.01	0.0778	0.14	**339**	**1,410**
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
NA indicates sample was analyzed for this constituent.

6.0 Intrinsic Bioremediation Assessment

The following assessment for intrinsic bioremediation occurring on site is identical to last year's annual report and is being repeated because the same trends and conditions are present.

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, the mass of benzene degraded per unit mass of electron acceptor utilized and metabolic byproduct produced was calculated 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	---	1.64	1.59
NO_3	Denitrification	Decreases	0.21*	---	6.74	1.72
Fe^{2+}	Ferric Iron Reduction	Increases	---	0.046	116.18	5.34
SO_4	Sulfate Reduction	Decreases	0.22*	---	77	32.37
					Total Biodegradation Capacity	41.02
					Highest benzene concentration observed on site	20.9
					Average benzene concentration observed on site	2.36

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

Field measurements of DO and groundwater samples of nitrate and sulfate (for laboratory analysis) have historically been recovered at the Linam Ranch Plant in order to monitor the changes in groundwater chemistry associated with biodegradation. Table 5 is a summary of the DO, nitrate, and sulfate concentrations. Iron concentrations are included with the other WQCC metals listed on Table 4. None of these concentrations exceed the WQCC standards except for the nitrate levels observed in MW-13 (12 mg/L) and the sulfate levels observed in MW-5 (805 mg/L). Nitrate is commonly generated from fertilizing or septic sources; however, no such operations are known to exist in the area of monitoring well MW-13. Changes in dissolved oxygen, nitrate, and sulfate concentrations with time are depicted in Figures 5, 6, and 7, respectively.

Hydrocarbon-impacted wells (MW-5, MW-10, MW-10D, and MW-11) are compared against upgradient and downgradient wells 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. The general decline in dissolved oxygen levels on the east side of the plant appears to indicate oxygen utilization during biodegradation processes.

- Nitrate and sulfate concentrations fluctuate over time therefore no trend relationship is noted. However, the presence of these constituents as electron acceptors indicates their availability for use by microorganisms in the course of hydrocarbon degradation.

- Increased concentrations of metabolic byproducts iron and manganese in monitoring wells MW-5, MW-10, and MW-10D indicates iron and manganese reduction conditions that are the result of anaerobic biodegradation processes.

- The biodegradation capacity of electron acceptors and metabolic byproducts (37.42 mg/L) exceeds the highest benzene concentration (20.9 mg/L) observed on site. The biodegradation capacity of electron acceptors and metabolic byproducts far exceeds the average benzene concentration (2.39 mg/L) observed on site by a ratio of 15.7 to 1. This indicates that the biodegradation process will continue.

Table 5
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
MW-1	05/17/95	0.51	<0.3	**1,039**
	08/25/99	1.90	**120**	**660**
	02/22/00	3.37	**130**	570
	08/17/00	0.35	**150**	590
	02/07/01	0.24	**96**	400
	08/02/01	2.04	2.5	268
MW-2	05/17/95	1.60	0.81	62
	08/24/99	5.90	2.6	18
	02/22/00	4.47	2.8	17
	08/17/00	1.06	0.53	17
	02/07/01	3.36	1.8	19
	08/02/01	4.37	2.1	15
MW-3	05/17/95	4.88	3.71	126
	02/09/99	8.5	5.2	59
	08/24/99	7.61	3.7	35
	02/22/00	8.08	4.0	33
	08/17/00	7.48	1.9	44
	02/07/01	6.78	2.8	44
	08/02/01	8.79	3.1	44
MW-4	05/17/95	NS	<0.15	78
MW-5	05/17/95	NS	<0.15	67
	08/25/99	0.00	<1.0	84
	02/23/00	0.34	< 1.0	64
	08/18/00	0.10	<0.1	390
	02/08/01	0.02	<1.0	370
	08/03/01	2.61	<1.0	**805**
MW-6	05/17/95	NS	<0.15	72
MW-7	05/17/95	6.50	2.8	161
	08/24/99	6.70	5.5	120
	02/22/00	7.39	6.0	96
	08/17/00	6.98	3.0	98
	02/07/01	9.82	5.2	94
	08/02/01	7.64	5.2	90
MW-8	05/17/95	1.60	**33.4**	**602**
	08/24/99	4.88	3.2	31
	02/22/00	3.48	3.4	22
	08/18/00	5.13	13	16
	02/07/01	2.67	1.9	22
	08/02/01	4.70	2.3	27
WQCC Standards		---	10.0	600

NA indicates not analyzed for this constituent.
Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
Dissolved oxygen (DO) readings obtained with electronic DO meters.
New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
MW-9	05/17/95	1.85	4.70	126
	11/14/95	2.82	NA	NA
	01/17/96	5.3	NA	NA
	04/24/96	2.0	0.2	60
	01/22/97	14.6	3.4	71
	08/15/97	3.8	3.4	82
	01/22/98	5.2	4.1	160
	07/20/98	2.38	5.4	72
	02/09/99	3.1	5.4	72
	08/24/99	3.16	4.5	76
	02/22/00	0.28	4.5	75
	08/18/00	0.60	1.3	81
	02/07/01	0.48	2.5	77
	08/02/01	1.61	2.3	75
MW-10	05/17/95	1.05	1.030	184
	11/14/95	1.98	<0.01	174
	01/17/96	5.0	<0.5	40
	04/24/96	1.6	<0.1	16
	01/22/97	8.75	<0.1	25
	08/15/97	2.9	< 1.0	210
	01/22/98	4.5	0.22	52
	07/22/98	1.13	3.50	40
	02/09/99	1.6	3.50	40
	08/25/99	0.00	<1.0	200
	02/23/00	0.47	< 1.0	180
	08/18/00	NA	<0.1	200
	02/08/01	0.00	<1.0	220
	08/03/01	2.34	<1.0	206
MW-10D	05/17/95	0.45	0.63	232
	11/14/95	2.41	NA	NA
	01/17/96	5.0	NA	NA
	04/24/96	1.8	<0.1	21
	01/22/97	5.5	<0.1	210
	08/15/97	1.8	< 1.0	180
	01/22/98	5.7	1.30	230
	07/22/98	1.49	4.0	140
	07/22/98	1.9	4.0	140
	08/25/99	1.54	2.4	220
	02/23/00	3.03	2.7	220
	08/18/00	0.50	<0.1	250
	02/07/01	0.06	<1.0	260
	08/03/01	1.88	<1.0	300
WQCC Standards		---	10.0	600

NA indicates not analyzed for this constituent.
Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
Dissolved oxygen (DO) readings obtained with electronic DO meters.
New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
	08/03/01	1.88	<1.0	300
MW-11	05/17/95	1.05	**28.6**	190
	11/14/95	2.30	1.56	184
	01/17/96	2.8	**43.3**	150
	04/24/96	2.0	1.9	124
	01/22/97	7.0	**24**	170
	08/15/97	1.8	**40**	160
	01/22/98	4.3	**58**	150
	07/22/98	1.06	**19**	200
	02/09/99	1.4	**19**	200
	08/24/99	0.09	8.0	120
	02/23/00	0.58	7.0	120
	08/18/00	0.00	3.1	120
	02/07/01	0.07	4.0	100
	08/03/01	2.46	4.1	96
MW-12	05/17/95	0.97	1.01	206
	11/14/95	3.15	NA	NA
	01/17/96	1.7	NA	NA
	04/24/96	1.8	<0.1	53
	01/22/97	11.8	<0.1	150
	08/15/97	1.9	< 1.0	210
	01/22/98	4.2	0.41	150
	07/22/98	2.52	0.71	130
	02/09/99	3.7	0.71	130
	08/24/99	0.14	<1.0	200
	02/22/00	0.81	3.10	73
	08/18/00	0.26	<0.1	120
	02/07/01	0.22	1.6	120
	08/02/01	2.23	2.2	116
MW-13	05/17/95	1.51	5.00	99
	11/14/95	5.00	0.02	44
	01/17/96	2.0	6.54	42
	04/24/96	2.6	0.2	46
	01/22/97	9.5	5.4	65
	08/15/97	5.1	4.5	78
	01/22/98	7.4	7.3	88
	07/20/98	3.62	**12**	74
	02/09/99	2.7	**12**	74
	08/24/99	0.30	**16**	83
	02/23/00	0.59	9.1	86
	08/18/00	0.31	3.2	100
	02/07/01	0.17	4.3	100
	08/03/01	2.63	1.3	126
WQCC Standards		---	10.0	600

NA indicates not analyzed for this constituent.
Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
Dissolved oxygen (DO) readings obtained with electronic DO meters.
New Mexico Water Quality Control Commission (WQCC) standards as listed in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

FIGURE 5A
Dissolved Oxygen Concentrations Versus Time
(WEST SIDE OF PLANT)

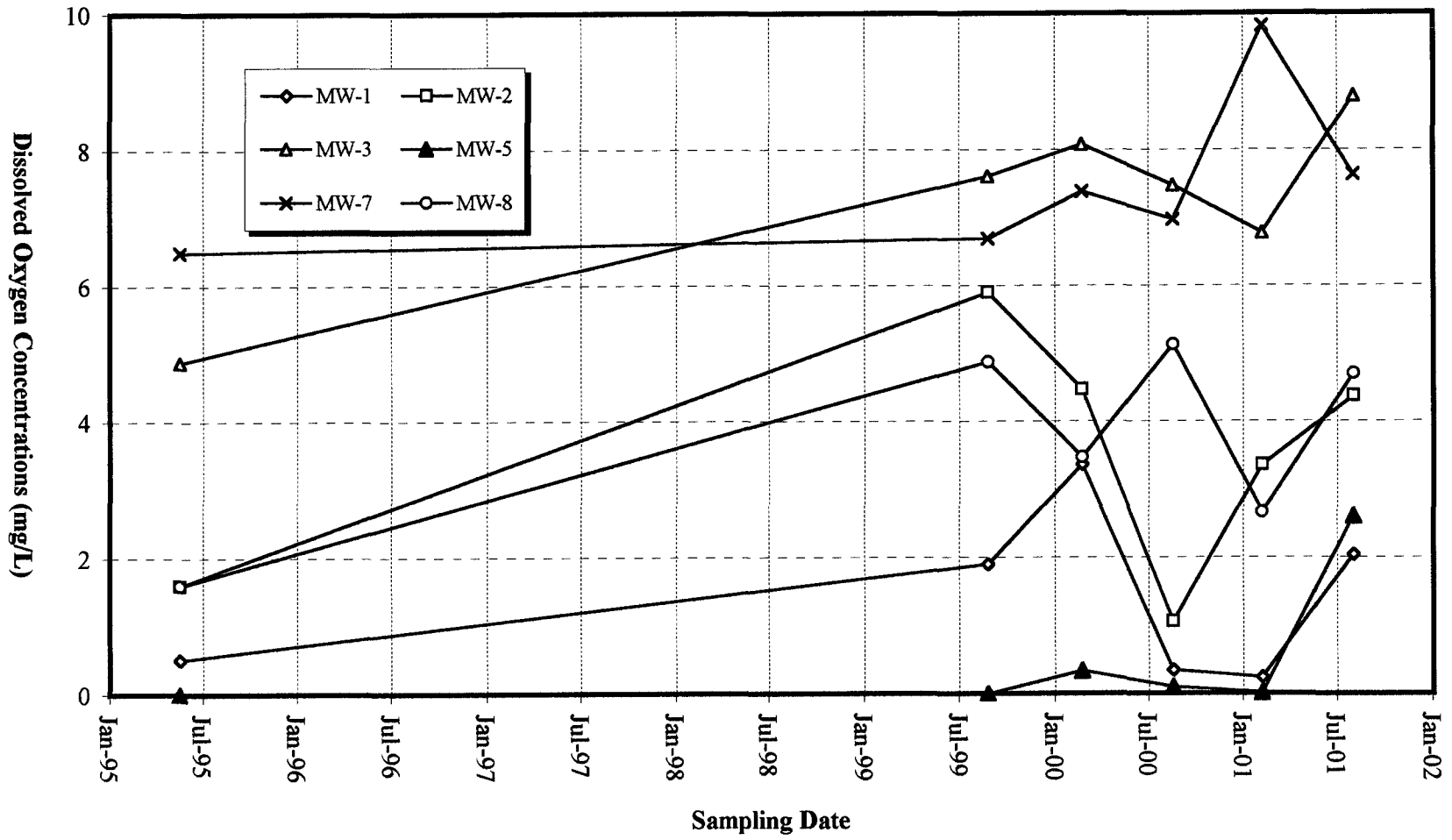


FIGURE 5B
Dissolved Oxygen Concentrations Versus Time
(EAST SIDE OF PLANT)

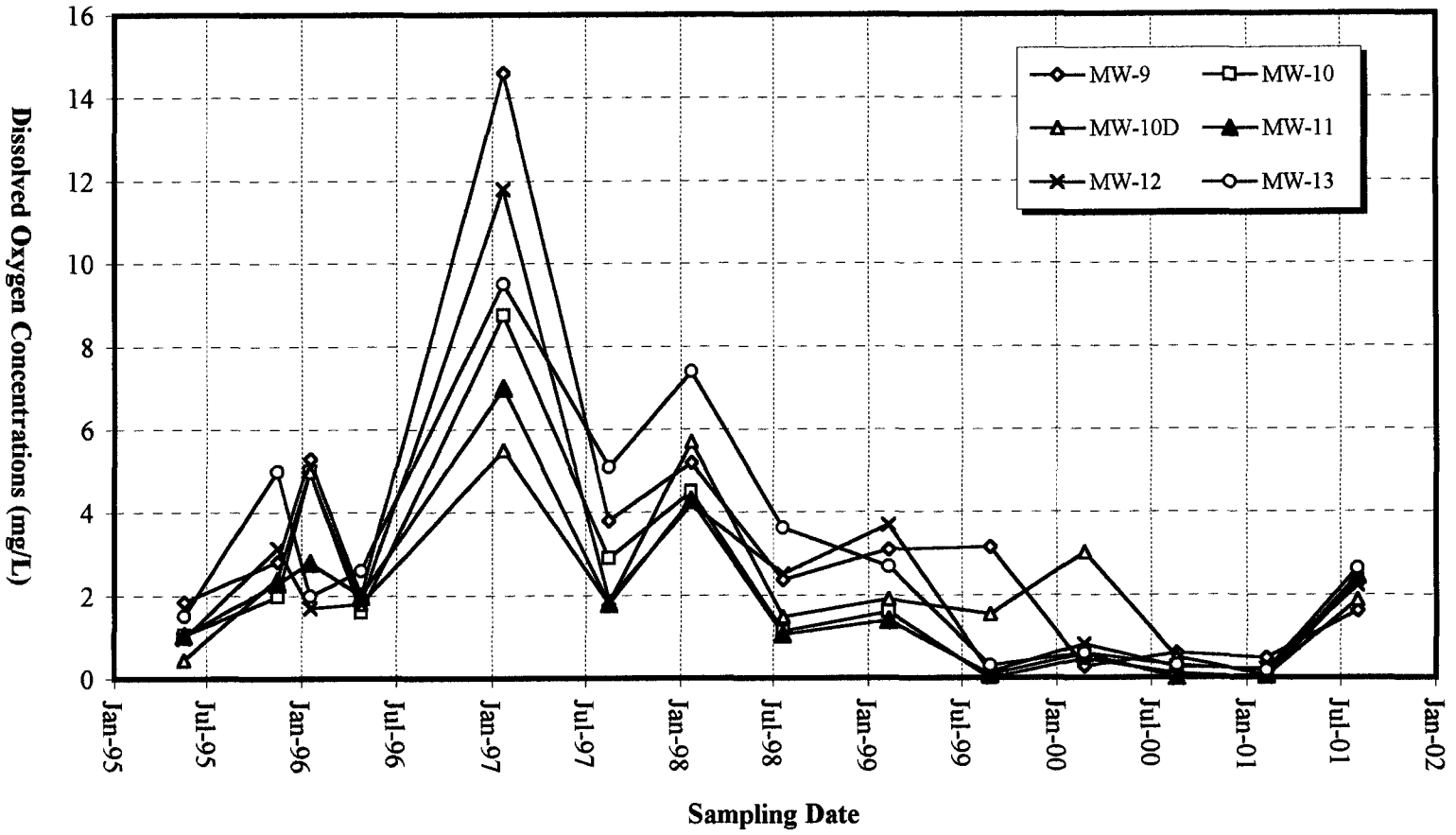


FIGURE 6A
Nitrate Concentrations Versus Time
(WEST SIDE OF PLANT)

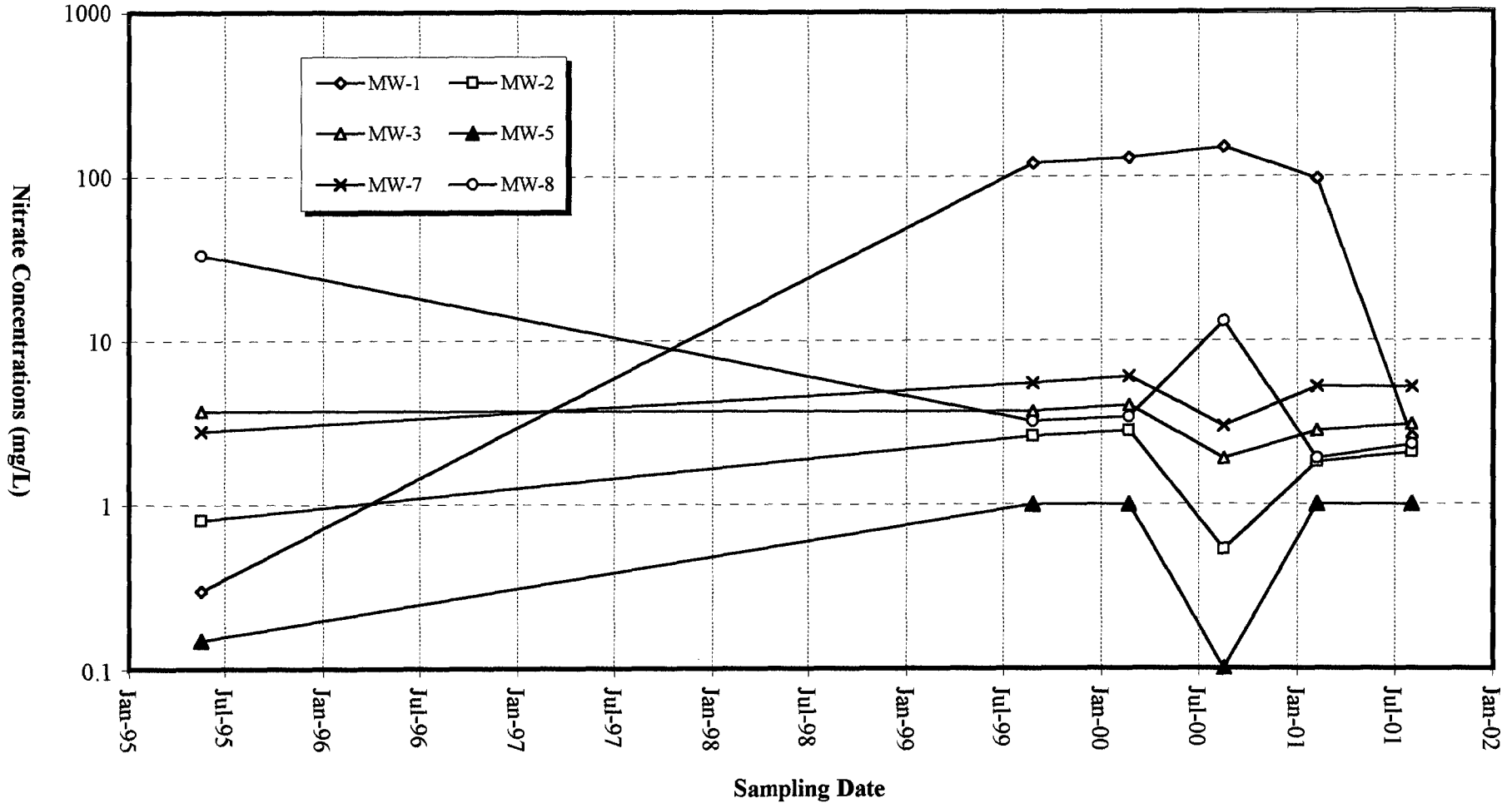


FIGURE 6B
Nitrate Concentrations Versus Time
(EAST SIDE OF PLANT)

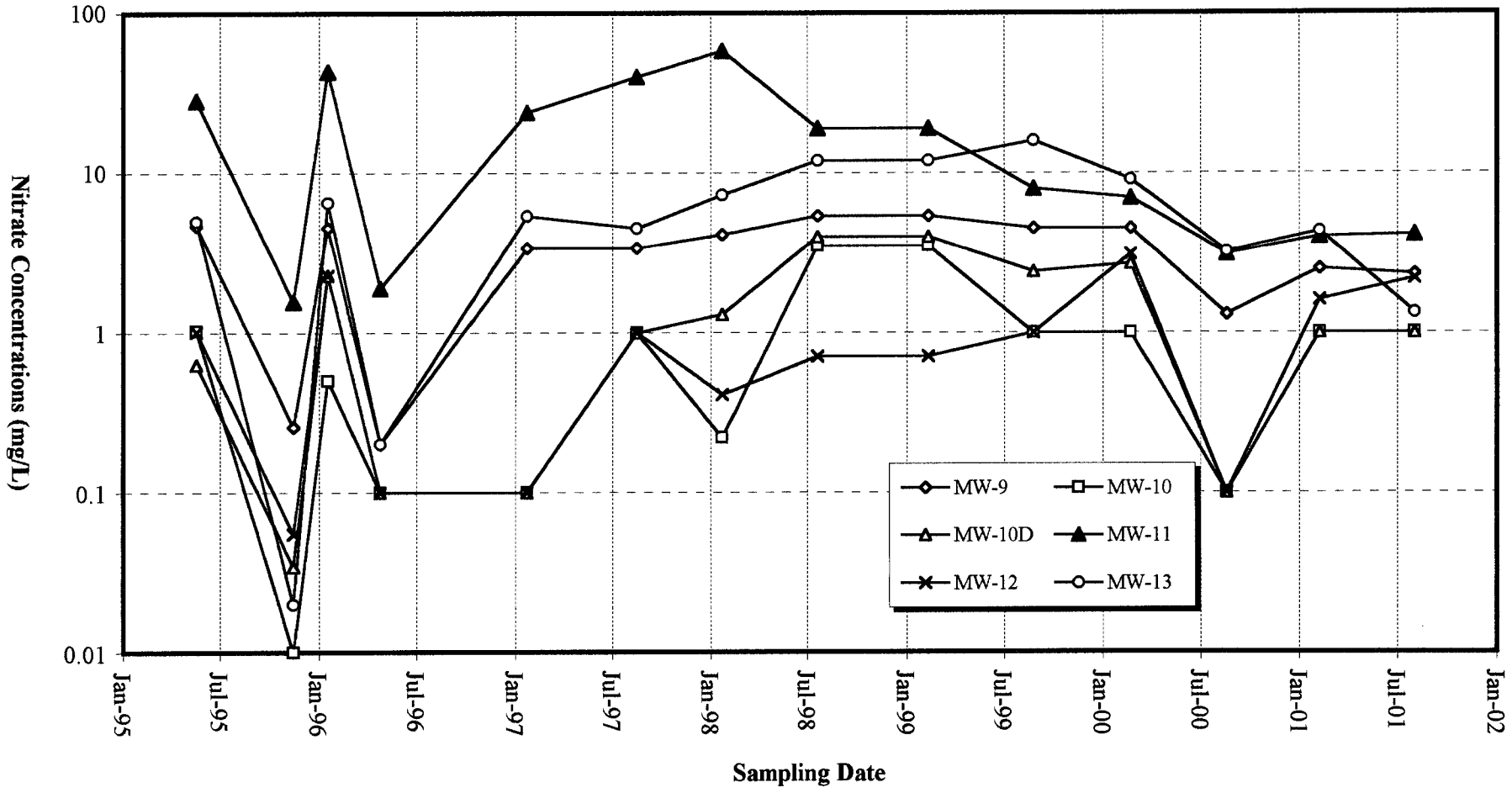


FIGURE 7A
Sulfate Concentrations Versus Time
(WEST SIDE OF PLANT)

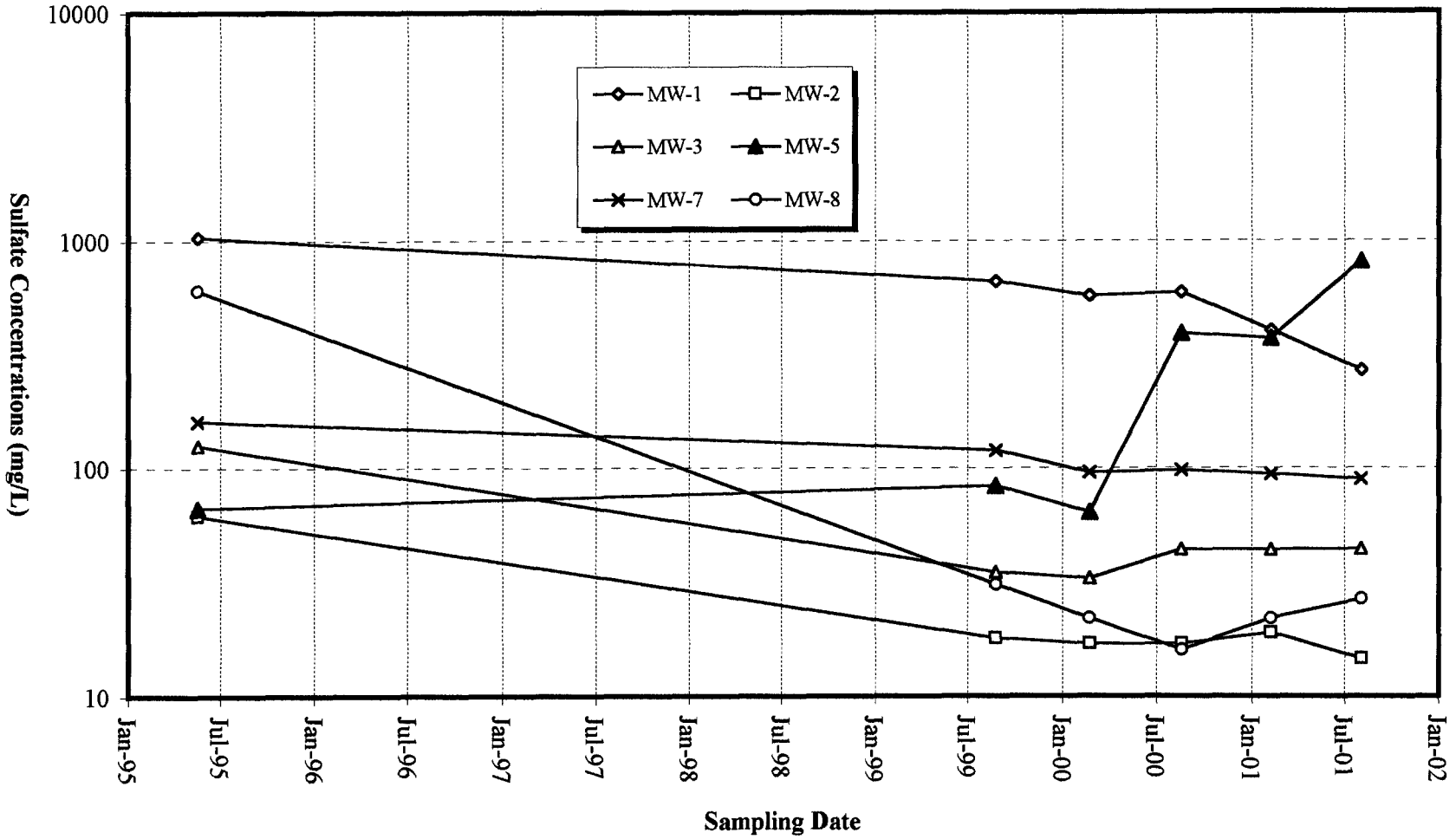
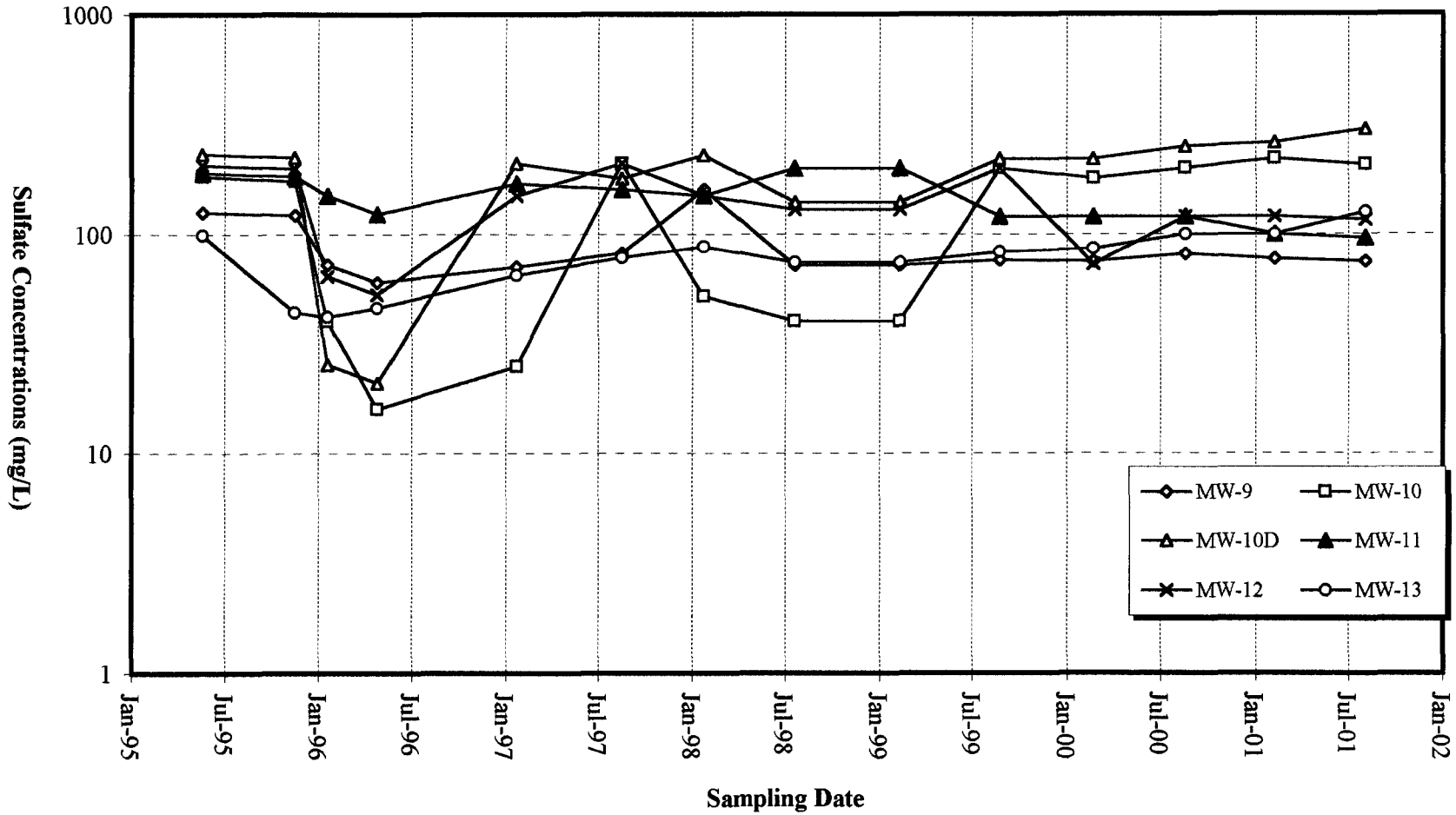


FIGURE 7B
Sulfate Concentrations Versus Time
(EAST SIDE OF PLANT)



7.0 Free Product Recovery

Hydrophobic adsorbent socks were used in monitoring wells MW-4 and MW-6 to recover free product from the groundwater beneath the former oil/water separator system at Linam Ranch Plant. As of October 9, 2001, the product recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 14 gallons of free product from MW-4 and MW-6. Product thickness and recovery volumes are listed on Table 6. Figures 8A and 8B graphically depict the produce thickness and cumulative recovery versus time for MW-4 and MW-6, respectively.

Table 6
LNAPL Recovery Volumes
Linam Ranch Plant

Date	LNAPL Thickness (feet)		LNAPL Recovered (gallons)		Cumulative Product LNAPL (gallons)
	MW-4	MW-6	MW-4	MW-6	
04/22/98	0.43	0.05	0.09	0.04	0.13
05/06/98	0.44	0.03	0.08	0.03	0.24
06/23/98	0.47	0.07	0.35	0.00	0.60
07/20/98	0.36	0.08	0.38	0.00	0.98
08/07/98	0.16	0.12	0.35	0.00	1.33
09/17/98	0.09	0.19	0.35	0.01	1.68
10/28/98	0.05	0.00	0.36	0.01	2.05
11/17/98	0.04	0.02	0.14	0.01	2.19
12/15/98	0.06	<0.01	0.35	0.01	2.55
01/18/99	0.11	0.01	0.37	0.00	2.92
02/09/99	0.13	<0.01	0.38	0.00	3.30
03/24/99	0.53	0.07	0.40	0.41	4.11
04/21/99	0.72	0.01	0.94	0.00	5.05
05/13/99	1.00	0.03	0.45	0.00	5.50
06/14/99	1.32	0.01	0.47	0.00	5.96
08/04/99	1.10	<0.01	0.46	0.00	6.42
08/20/99	1.11	<0.01	0.45	0.00	6.87
08/25/99	0.88	<0.01	0.42	0.00	7.29
09/14/99	0.70	0.00	0.43	0.00	7.72
10/26/99	0.45	<0.01	0.42	0.00	8.14
11/22/99	0.37	<0.01	0.42	0.00	8.56
12/22/99	0.23	0.01	0.42	0.00	8.98
01/26/00	0.12	<0.01	0.40	0.25	9.63
02/22/00	0.03	<0.01	0.18	0.20	10.01
04/04/00	<0.01	0.00	0.13	0.00	10.14
04/24/00	0.05	0.16	0.02	0.00	10.16
06/15/00	0.03	0.48	0.13	0.71	11.00
07/12/00	<0.01	<0.01	0.03	0.04	11.07
08/18/00	<0.01	<0.01	0.002	0.002	11.08
10/02/00	<0.01	0.70	0.00	0.84	11.92
12/14/00	<0.01	0.08	0.00	0.22	12.14
01/23/01	0.01	0.71	0.10	0.56	12.80
02/06/01	0.01	0.11	0.04	0.18	13.02
03/21/01	0.01	0.35	0.00	0.39	13.41
05/16/01	0.00	0.02	0.07	0.12	13.61
06/19/01	0.01	0.01	0.01	0.05	13.66
07/20/01	0.00	0.02	0.03	0.08	13.78
08/02/01	0.01	0.01	0.00	0.05	13.83
09/11/01	0.01	0.11	0.02	0.14	14.00
10/09/01	0.01	0.04	0.02	0.15	14.16
Total Volume of LNAPL Recovered On Site:					**14.16**

LNAPL recovery methods used:
MW-4: Hydrophobic (oil adsorbent) sock (passive bailer replaced with sock on 08-18-00).
MW-6: Hydrophobic (oil adsorbent) sock (passive bailer replaced with sock on 09-17-98).

FIGURE 8A
LNAPL Thickness and Recovery Versus Time (MW-4)

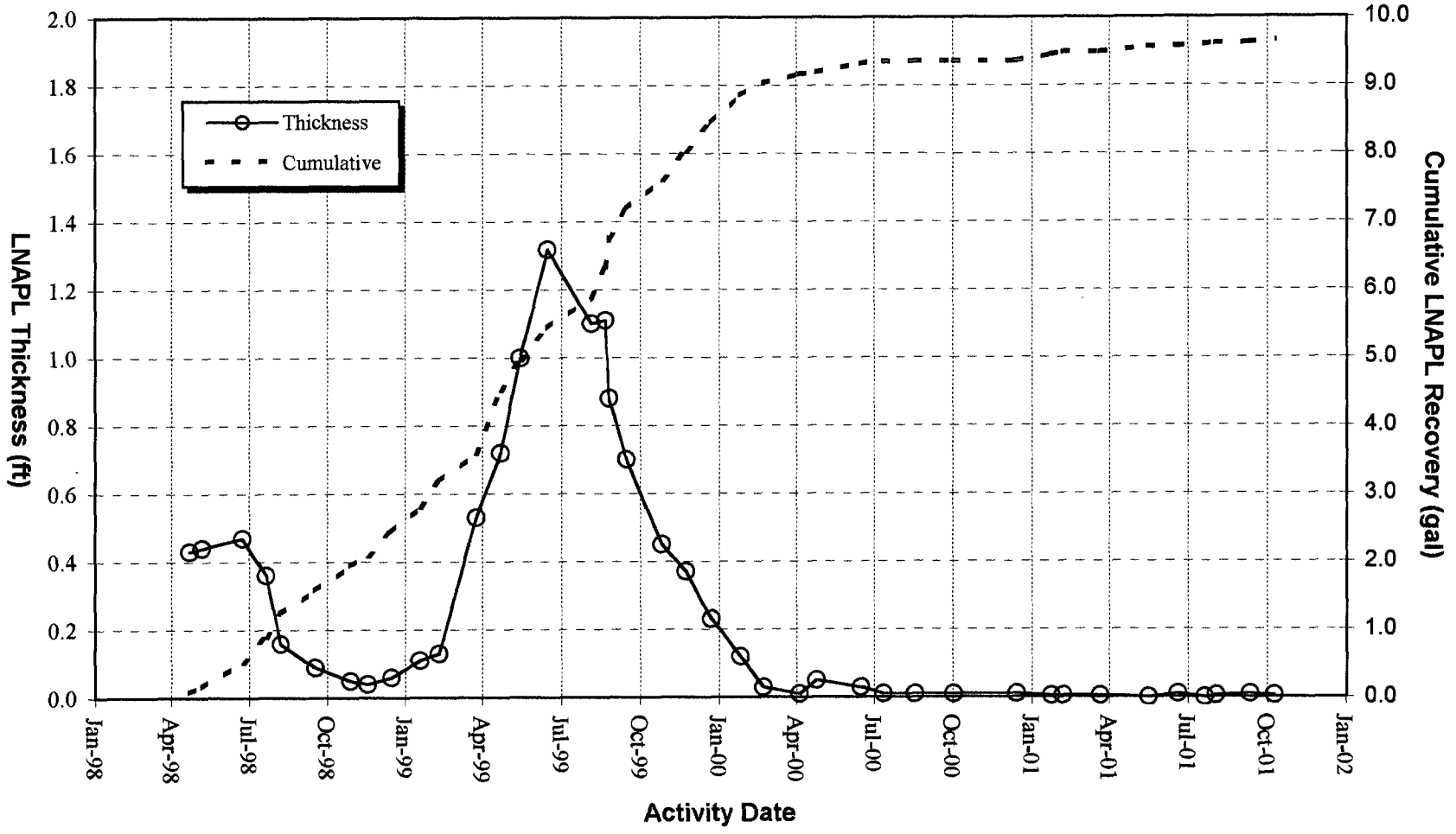
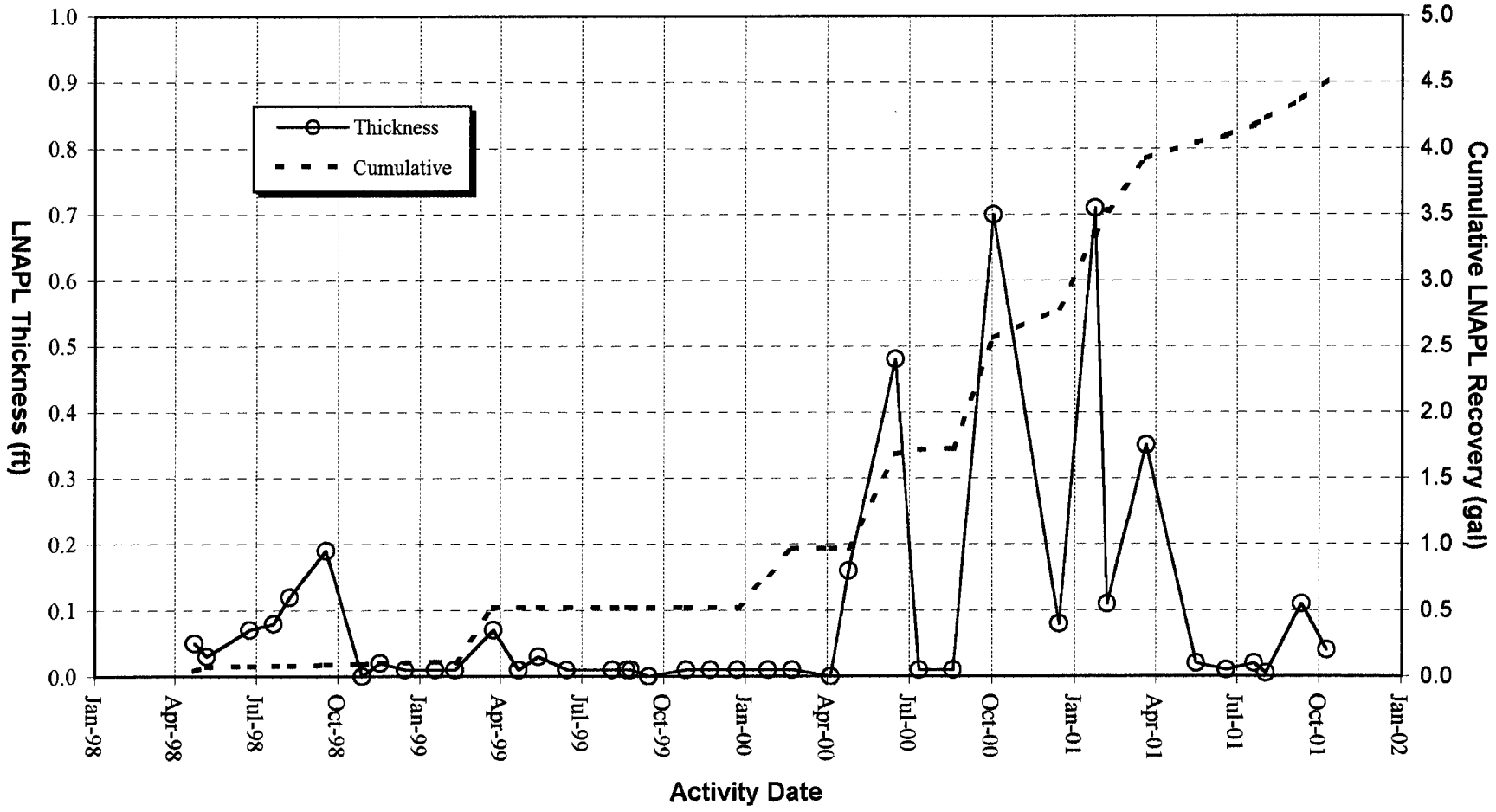


FIGURE 8B
LNAPL Thickness and Recovery Versus Time (MW-6)



8.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Linam Ranch Plant are presented below.

- BTEX concentrations in monitoring wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-10D, MW-11, MW-12 and MW-13 were below the New Mexico WQCC standards for each constituent.

- Benzene levels in MW-9 (0.038 mg/L) and MW-10 (1.64 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells. Although benzene concentrations in MW-9 (located downgradient from the EOTT tank area) increased from August 1999 to August 2000 they now appear to have stabilized. The concentrations in all of the other measured hydrocarbon constituents have remained below the laboratory detection levels.

- Dissolved hydrocarbon concentrations in MW-10 (located near the EOTT tank source area) and MW-10D (deeper completed twin to MW-10) have remained stable to decreasing since monitoring began in 1995.

- Dissolved hydrocarbon concentrations in MW-11 (located upgradient from the EOTT tank source area) have also decreased since monitoring began in 1995 and now appear be stabilizing at or below the WQCC standard levels.

- Benzene concentrations in MW-13 (located downgradient from the EOTT tank area) have decreased to below the WQCC standard level for the first time since April of 1996. The concentrations in all of the other measured hydrocarbon constituents have remained at or below the laboratory detection levels. It is suspected that the elevated levels of dissolved benzene in MW-13 from January 1996 to February 2001 indicate a downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-10 during the April 24, 1996 sampling event. Preliminary estimates, based on the maximum benzene levels observed in each well indicate that the benzene slug is migrating at approximately 0.49 feet per day and attenuating at a rate of approximately one half-life per 40 feet. At this rate the benzene slug should not represent an environmental threat to potential future receptors within 160 feet southwest of MW-13.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of October 9, 2001, the light non-aqueous phase liquids (LNAPL) recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 14 gallons of LNAPL (condensate) from monitoring wells MW-4 and MW-6. The measured thickness of LNAPL in MW-4 has remained below 0.02 feet during the 2001 monitoring period, while the LNAPL thickness in MW-6 has been measured from 0.01 to 0.70 feet over this time..

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

9.0 Recommendations

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2002.
- Discontinue analyses for aluminum, barium, cadmium, chromium, and silver since these constituents have been below WQCC standards for over five years.
- Continue free product removal from MW-4 and MW-6 using absorbent socks with monthly inspections.

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
155 McCutcheon, Suite H El Paso, Texas 79932 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: February 19, 2001

Order ID Number: A01020916

Project Number: N/A
Project Name: Duke Energy Field Services
Project Location: Linam Ranch Gas Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis. Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
164708	MW-7	Water	2/7/01	8:00	2/9/01
164709	MW-2	Water	2/7/01	8:15	2/9/01
164710	MW-8	Water	2/7/01	9:40	2/9/01
164711	MW-1	Water	2/7/01	10:10	2/9/01
164712	MW-3	Water	2/7/01	10:40	2/9/01
164713	MW-9	Water	2/7/01	11:15	2/9/01
164714	MW-10	Water	2/7/01	12:00	2/9/01
164715	MW-12	Water	2/7/01	14:25	2/9/01
164716	MW-11	Water	2/7/01	16:00	2/9/01
164717	Duplicate	Water	2/7/01	:	2/9/01
164718	MW-13	Water	2/7/01	17:15	2/9/01
164719	MW-10	Water	2/8/01	9:35	2/9/01
164720	MW-5	Water	2/8/01	10:25	2/9/01
164721	Rinsate	Water	2/8/01	10:55	2/9/01

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 17 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 164708 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M.P.O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.478	mg/L	1	0.10	95	72 - 128
4-BFB		0.418	mg/L	1	0.10	83	72 - 128

Sample: 164708 - MW-7

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC08980	Date Analyzed:	2/9/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB07735	Date Prepared:	2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[1]	5.2	mg/L	5	0.20
Sulfate		94	mg/L	5	0.50

Sample: 164709 - MW-2

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M.P.O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.464	mg/L	1	0.10	92	72 - 128
4-BFB		0.41	mg/L	1	0.10	82	72 - 128

Sample: 164709 - MW-2

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC08980	Date Analyzed:	2/9/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB07735	Date Prepared:	2/9/01

[1] Sample out of hold time for NO3.

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[2]	1.8	mg/L	5	0.20
Sulfate		19	mg/L	5	0.50

Sample: 164710 - MW-8

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M.P.O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.467	mg/L	1	0.10	93	72 - 128
4-BFB		0.412	mg/L	1	0.10	82	72 - 128

Sample: 164710 - MW-8

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08980 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[3]	1.9	mg/L	5	0.20
Sulfate		22	mg/L	5	0.50

Sample: 164711 - MW-1

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M.P.O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.465	mg/L	1	0.10	93	72 - 128
4-BFB		0.417	mg/L	1	0.10	83	72 - 128

[2]Sample out of hold time for NO3.
[3]Sample out of hold time for NO3.

Sample: 164711 - MW-1

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC09035 Date Analyzed: 2/12/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07783 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[4]	96	mg/L	50	0.20
Sulfate		400	mg/L	10	0.50

Sample: 164712 - MW-3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.468	mg/L	1	0.10	93	72 - 128
4-BFB		0.414	mg/L	1	0.10	82	72 - 128

Sample: 164712 - MW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08980 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[5]	2.8	mg/L	5	0.20
Sulfate		44	mg/L	5	0.50

Sample: 164713 - MW-9

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.445	mg/L	1	0.10	89	72 - 128
4-BFB		0.407	mg/L	1	0.10	81	72 - 128

[4]Sample ran out of hold time for NO3.
[5]Sample out of hold time for NO3.

Sample: 164713 - MW-9

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08980 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N	[6]	2.5	mg/L	5	0.20
Sulfate		77	mg/L	5	0.50

Sample: 164714 - MW-10 d

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.448	mg/L	1	0.10	89	72 - 128
4-BFB		0.415	mg/L	1	0.10	83	72 - 128

Sample: 164714 - MW-10 d

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08979 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.0	mg/L	5	0.20
Sulfate	[7]	260	mg/L	10	0.50

Sample: 164715 - MW-12

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.101	mg/L	1	0.10	101	72 - 128

Continued ...

[6]Sample out of hold time for NO3.

[7]Sulfate re-ran on IC021001-2.sch (PB07737; QC08983). ICV %IA = 95; CCV %IA = 95; matrix spikes RPD = 1; matrix spikes %EA = 96; blank spikes RPD = 1; blank spikes %EA = 94.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-BFB		0.088	mg/L	1	0.10	88	72 - 128

Sample: 164715 - MW-12

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08979 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		1.6	mg/L	5	0.20
Sulfate		120	mg/L	5	0.50

Sample: 164716 - MW-11

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.013	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.013	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.104	mg/L	1	0.10	104	72 - 128
4-BFB		0.091	mg/L	1	0.10	91	72 - 128

Sample: 164716 - MW-11

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08979 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		4.0	mg/L	5	0.20
Sulfate		100	mg/L	5	0.50

Sample: 164717 - Duplicate

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.032	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.032	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.103	mg/L	1	0.10	103	72 - 128
4-BFB		0.09	mg/L	1	0.10	90	72 - 128

Sample: 164718 - MW-13

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.023	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.023	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.479	mg/L	1	0.10	95	72 - 128
4-BFB		0.428	mg/L	1	0.10	85	72 - 128

Sample: 164718 - MW-13

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC08980	Date Analyzed:	2/9/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB07735	Date Prepared:	2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		4.3	mg/L	5	0.20
Sulfate		100	mg/L	5	0.50

Sample: 164719 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC09014	Date Analyzed:	2/12/01
Analyst:	JW	Preparation Method:	E 5030B	Prep Batch:	PB07765	Date Prepared:	2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.23	mg/L	5	0.001
Toluene		0.082	mg/L	5	0.001
Ethylbenzene		0.102	mg/L	5	0.001
M,P,O-Xylene		0.086	mg/L	5	0.001
Total BTEX		1.5	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.469	mg/L	1	0.10	93	72 - 128
4-BFB		0.439	mg/L	1	0.10	87	72 - 128

Sample: 164719 - MW-10

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08980 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.0	mg/L	5	0.20
Sulfate		220	mg/L	5	0.50

Sample: 164720 - MW-5

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09014 Date Analyzed: 2/12/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07765 Date Prepared: 2/12/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.084	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.084	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.468	mg/L	1	0.10	93	72 - 128
4-BFB		0.466	mg/L	1	0.10	93	72 - 128

Sample: 164720 - MW-5

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC08980 Date Analyzed: 2/9/01
Analyst: JS Preparation Method: N/A Prep Batch: PB07735 Date Prepared: 2/9/01

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		<1.0	mg/L	5	0.20
Sulfate	[8]	370	mg/L	10	0.50

Sample: 164721 - Rinsate

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC09108 Date Analyzed: 2/13/01
Analyst: JW Preparation Method: E 5030B Prep Batch: PB07845 Date Prepared: 2/13/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.102	mg/L	1	0.10	102	72 - 128
4-BFB		0.086	mg/L	1	0.10	86	72 - 128

[8]Sulfate re-ran on IC021201-1.sch (PB07783; QC09035). ICV %IA = 104; CCV %IA = 105; matrix spikes RPD = 1; matrix spikes %EA = 96; blank spikes RPD = 0; blank spikes %EA = 104.

Quality Control Report
Method Blank

Method Blank QCBatch: QC08979

Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<0.5	mg/L	0.50

Method Blank QCBatch: QC08980

Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<0.5	mg/L	0.50

Method Blank QCBatch: QC09014

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.101	mg/L	0.10	101	72 - 128
4-BFB		0.088	mg/L	0.10	88	72 - 128

Method Blank QCBatch: QC09035

Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<0.5	mg/L	0.50

Method Blank QCBatch: QC09108

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001

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Param	Flag	Results	Units	Reporting Limit
Ethylbenzene		<0.001	mg/L	0.001
M.P.O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.104	mg/L	0.10	104	72 - 128
4-BFB		0.088	mg/L	0.10	88	72 - 128

Quality Control Report
Lab Control Spikes and Duplicate Spikes

LCS QC Batch: QC08979

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Fluoride		2.46	mg/L	1	2.50	<0.2	98		80 - 120	20
Nitrate-N		2.36	mg/L	1	2.50	<0.2	94		80 - 120	20
Sulfate		12.02	mg/L	1	12.50	<0.5	96		80 - 120	20

LCSD QC Batch: QC08979

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Fluoride		2.46	mg/L	1	2.50	<0.2	98	0	80 - 120	20
Nitrate-N		2.36	mg/L	1	2.50	<0.2	94	0	80 - 120	20
Sulfate		12.08	mg/L	1	12.50	<0.5	96	0	80 - 120	20

LCS QC Batch: QC08980

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Fluoride		2.45	mg/L	1	2.50	<0.2	98		80 - 120	20
Nitrate-N		2.35	mg/L	1	2.50	<0.2	94		80 - 120	20
Sulfate		12.08	mg/L	1	12.50	<0.5	96		80 - 120	20

LCSD QC Batch: QC08980

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Fluoride		2.46	mg/L	1	2.50	<0.2	98	0	80 - 120	20
Nitrate-N		2.36	mg/L	1	2.50	<0.2	94	0	80 - 120	20
Sulfate		12.08	mg/L	1	12.50	<0.5	96	0	80 - 120	20

LCS QC Batch: QC09014

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.097	mg/L	1	0.10	<0.001	97		80 - 120	20
Benzene		0.1	mg/L	1	0.10	<0.001	100		80 - 120	20
Toluene		0.101	mg/L	1	0.10	<0.001	101		80 - 120	20
Ethylbenzene		0.101	mg/L	1	0.10	<0.001	101		80 - 120	20
M,P,O-Xylene		0.31	mg/L	1	0.30	<0.001	103		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.098	mg/L	1	0.10	98	72 - 128
4-BFB		0.099	mg/L	1	0.10	99	72 - 128

LCSD QC Batch: QC09014

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.092	mg/L	1	0.10	<0.001	92	5	80 - 120	20
Benzene		0.098	mg/L	1	0.10	<0.001	98	2	80 - 120	20
Toluene		0.099	mg/L	1	0.10	<0.001	99	2	80 - 120	20
Ethylbenzene		0.1	mg/L	1	0.10	<0.001	100	1	80 - 120	20
M,P,O-Xylene		0.297	mg/L	1	0.30	<0.001	99	4	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.099	mg/L	1	0.10	99	72 - 128
4-BFB		0.1	mg/L	1	0.10	100	72 - 128

LCS QC Batch: QC09035

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.69	mg/L	1	12.50	<0.5	93		80 - 120	20
Fluoride	[9]	2.41	mg/L	1	2.50	<0.2	96		80 - 120	20
Nitrate-N		2.38	mg/L	1	2.50	<0.2	95		80 - 120	20

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Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Sulfate		13.01	mg/L	1	12.50	<0.5	104		80 - 120	20

LCSD

QC Batch: QC09035

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		11.70	mg/L	1	12.50	<0.5	93	0	80 - 120	20
Fluoride		2.43	mg/L	1	2.50	<0.2	97	1	80 - 120	20
Nitrate-N		2.38	mg/L	1	2.50	<0.2	95	0	80 - 120	20
Sulfate		13.00	mg/L	1	12.50	<0.5	104	0	80 - 120	20

LCS

QC Batch: QC09108

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.09	mg/L	1	0.10	<0.001	90		80 - 120	20
Benzene		0.109	mg/L	1	0.10	<0.001	109		80 - 120	20
Toluene		0.111	mg/L	1	0.10	<0.001	111		80 - 120	20
Ethylbenzene		0.111	mg/L	1	0.10	<0.001	111		80 - 120	20
M.P,O-Xylene		0.334	mg/L	1	0.30	<0.001	111		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.106	mg/L	1	0.10	106	72 - 128
4-BFB		0.102	mg/L	1	0.10	102	72 - 128

LCSD

QC Batch: QC09108

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.083	mg/L	1	0.10	<0.001	83	8	80 - 120	20
Benzene		0.104	mg/L	1	0.10	<0.001	104	5	80 - 120	20
Toluene		0.106	mg/L	1	0.10	<0.001	106	5	80 - 120	20
Ethylbenzene		0.106	mg/L	1	0.10	<0.001	106	5	80 - 120	20
M.P,O-Xylene		0.32	mg/L	1	0.30	<0.001	106	4	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.103	mg/L	1	0.10	103	72 - 128
4-BFB		0.1	mg/L	1	0.10	100	72 - 128

Quality Control Report
Matrix Spikes and Duplicate Spikes

MS QC Batch: QC08979

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N		18.74	mg/L	1	12.50	7.0	93		80 - 120	20
Sulfate		246.24	mg/L	1	62.50	190	89		80 - 120	20

MSD QC Batch: QC08979

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N		18.72	mg/L	1	12.50	7.0	93	0	80 - 120	20
Sulfate		246.23	mg/L	1	62.50	190	89	0	80 - 120	20

MS QC Batch: QC08980

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N		18.54	mg/L	1	12.50	6.6	95		80 - 120	20
Sulfate		219.89	mg/L	1	62.50	160	95		80 - 120	20

MSD QC Batch: QC08980

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N		18.47	mg/L	1	12.50	6.6	94	0	80 - 120	20
Sulfate		220.68	mg/L	1	62.50	160	97	1	80 - 120	20

MS QC Batch: QC09035

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N	[10]	134.23	mg/L	1	125	12	97		80 - 120	20
Sulfate	[11]	990.19	mg/L	1	625	460	84		80 - 120	20

[10] I spiked the *50 dilution for 164799 but reported the *5 dilution. The correct %EA = 92.
[11] I spiked the *50 dilution for 164799 but reported the *10 dilution. The correct %EA = 96.

MSD

QC Batch: QC09035

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N	[12]	134.58	mg/L	1	125	12	98	0	80 - 120	20
Sulfate	[13]	983.77	mg/L	1	625	460	83	1	80 - 120	20

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QC Batch: QC08979

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.45	98	80 - 120	2/9/01
CL		mg/L	12.50	11.70	93	80 - 120	2/9/01
Fluoride		mg/L	2.50	2.45	98	80 - 120	2/9/01
Nitrate-N		mg/L	2.50	2.37	94	80 - 120	2/9/01
Sulfate		mg/L	12.50	12.01	96	80 - 120	2/9/01

ICV (1)

QC Batch: QC08979

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.45	98	80 - 120	2/9/01
CL		mg/L	12.50	11.68	93	80 - 120	2/9/01
Fluoride		mg/L	2.50	2.48	99	80 - 120	2/9/01
Nitrate-N		mg/L	2.50	2.37	94	80 - 120	2/9/01
Sulfate		mg/L	12.50	12.07	96	80 - 120	2/9/01

CCV (1)

QC Batch: QC08980

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.50	100	80 - 120	2/9/01
CL		mg/L	12.50	11.91	95	80 - 120	2/9/01
Fluoride		mg/L	2.50	2.49	99	80 - 120	2/9/01
Nitrate-N		mg/L	2.50	2.37	94	80 - 120	2/9/01
Sulfate		mg/L	12.50	12.07	96	80 - 120	2/9/01

[12] I spiked the *50 dilution for 164799 but reported the *5 dilution. The correct %EA = 92.
[13] I spiked the *50 dilution for 164799 but reported the *10 dilution. The correct %EA = 95.

ICV (1) QC Batch: QC08980

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.45	98	80 - 120	2/9/01
CL		mg/L	12.50	11.70	93	80 - 120	2/9/01
Fluoride		mg/L	2.50	2.45	98	80 - 120	2/9/01
Nitrate-N		mg/L	2.50	2.37	94	80 - 120	2/9/01
Sulfate		mg/L	12.50	12.01	96	80 - 120	2/9/01

CCV (1) QC Batch: QC09014

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	2/12/01
Benzene		mg/L	0.10	0.103	103	85 - 115	2/12/01
Toluene		mg/L	0.10	0.105	105	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	2/12/01
M.P.O-Xylene		mg/L	0.30	0.318	106	85 - 115	2/12/01

CCV (2) QC Batch: QC09014

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.099	99	85 - 115	2/12/01
Benzene		mg/L	0.10	0.103	103	85 - 115	2/12/01
Toluene		mg/L	0.10	0.104	104	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.103	103	85 - 115	2/12/01
M.P.O-Xylene		mg/L	0.30	0.318	106	85 - 115	2/12/01

ICV (1) QC Batch: QC09014

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.085	85	85 - 115	2/12/01
Benzene		mg/L	0.10	0.098	98	85 - 115	2/12/01
Toluene		mg/L	0.10	0.099	99	85 - 115	2/12/01
Ethylbenzene		mg/L	0.10	0.096	96	85 - 115	2/12/01
M.P.O-Xylene		mg/L	0.30	0.305	101	85 - 115	2/12/01

CCV (1) QC Batch: QC09035

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.48	99	80 - 120	2/12/01
CL		mg/L	12.50	11.77	94	80 - 120	2/12/01
Fluoride		mg/L	2.50	2.42	96	80 - 120	2/12/01
Nitrate-N		mg/L	2.50	2.40	96	80 - 120	2/12/01
Sulfate		mg/L	12.50	13.09	104	80 - 120	2/12/01

ICV (1) QC Batch: QC09035

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.47	98	80 - 120	2/12/01
CL		mg/L	12.50	11.83	94	80 - 120	2/12/01
Fluoride		mg/L	2.50	2.39	95	80 - 120	2/12/01
Nitrate-N		mg/L	2.50	2.38	95	80 - 120	2/12/01
Sulfate		mg/L	12.50	12.95	103	80 - 120	2/12/01

CCV (1) QC Batch: QC09108

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.093	93	85 - 115	2/13/01
Benzene		mg/L	0.10	0.11	110	85 - 115	2/13/01
Toluene		mg/L	0.10	0.113	113	85 - 115	2/13/01
Ethylbenzene		mg/L	0.10	0.109	109	85 - 115	2/13/01
M,P,O-Xylene		mg/L	0.30	0.334	111	85 - 115	2/13/01

CCV (2) QC Batch: QC09108

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	2/13/01
Benzene		mg/L	0.10	0.102	102	85 - 115	2/13/01
Toluene		mg/L	0.10	0.102	102	85 - 115	2/13/01
Ethylbenzene		mg/L	0.10	0.1	100	85 - 115	2/13/01
M,P,O-Xylene		mg/L	0.30	0.3	100	85 - 115	2/13/01

ICV (1) QC Batch: QC09108

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.087	87	85 - 115	2/13/01

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.105	105	85 - 115	2/13/01
Toluene		mg/L	0.10	0.107	107	85 - 115	2/13/01
Ethylbenzene		mg/L	0.10	0.106	106	85 - 115	2/13/01
M.P.O-Xylene		mg/L	0.30	0.319	106	85 - 115	2/13/01

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TRW Inc.
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№ 13615

Chain of Custody

Date 2/8/01 Page 1 of 1

Lab Name: TRACE ANALYSIS, INC.
Address: 6701 Aberdeen
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES): John Ferguson

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	TCLP Metals	B.c. Indicators NO3 + SO4						Number of Containers
MW-7 (0102070800)	Water	2/7/01	0800	✓														✓			164708			3
MW-2 (0102070815)	Water	2/7/01	0815	✓														✓			164709			3
MW-8 (0102070940)	Water	2/7/01	0940	✓														✓				10		3
MW-1 (0102071010)	Water	2/7/01	1010	✓														✓				11		3
MW-3 (0102071040)	Water	2/7/01	1040	✓														✓				12		3
MW-4 (0102071115)	Water	2/7/01	1115	✓														✓				13		3
MW-10.1 (0102071200)	Water	2/7/01	1200	✓														✓				14		3
MW-12 (0102071425)	Water	2/7/01	1425	✓														✓				15		3
MW-1 (0102071600)	Water	2/7/01	1600	✓														✓				16		3
Duplicate (0102070000)	Water	2/7/01	0000	✓														✓	no NO3 bottle			17		2

Project Information	Sample Receipt	Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Project Name: Duke Energy Field Srvcs	Total Containers:	John Ferguson 1500		
Project Location: Linam Ranch Gas Plant	COC Seals:	(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:	John Ferguson 2/8/01	(Printed Name) (Date)	(Printed Name) (Date)
Cost Center No.: P/6494/2AC	Conforms to Records:	TRW Inc	(Company)	(Company)
Shipping ID No.:	Lab No.:	Received By: (1)	Received By: (2)	Received By: (3)
P O No.:				Nell Green 10:00 am
Special Instructions/Comments: Invoice direct to Duke Energy Field Services Attn: Steve Weathers		(Signature) (Time)	(Signature) (Time)	(Signature) (Time) 2/9/01
		(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
		(Company)	(Company)	(Company) 2/9/01

Distribution: White, Canary, Lab, and Pink TRW

A01020916

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

№ 13616

Chain of Custody

Date 2/8/01 Page 1 of 1

Lab Name: TRACE ANALYSIS, INC.
Address: 6701 Aberdeen
Lubbock, Texas 79424
Telephone: 800-378-1296

Samplers (SIGNATURES): John Ferguson

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	TCLP Metals	Bic Indicators NO3 + SO4							Number of Containers
MW-13 (0102071715)	Water	2/7/01	1715	✓														✓		16471	8				3
MW-10 (0102080935)	Water	2/8/01	0935	✓														✓			19				3
MW-5 (0102081025)	Water	2/8/01	1025	✓														✓			20				3
Rinsate (0102081055)	Water	2/8/01	1055	✓																	21				2

Project Information	Sample Receipt	Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Project Name: Duke Energy Field Servs	Total Containers:	John Ferguson 1500 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Project Location: Linam Ranch Gas Plant	COC Seals:	John Ferguson 2/8/01 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
Project Manager: G.J Van Deventer	Rec'd Good Cond/Cold:	TRW Inc (Company)	(Company)	(Company)
Cost Center No.: P/6494/2AC	Conforms to Records:	Received By: (1)	Received By: (2)	Received By: (3)
Shipping ID No.:	Lab No.:	(Signature) (Time)	(Signature) (Time)	Nell Green 10:00am (Signature) (Time) 2-9-01
P O No.:		(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
		(Company)	(Company)	(Company)

Special Instructions/Comments:
Invoice direct to Duke Energy Field Services
Attn: Steve Weathers

Distribution: White, Canary, Pink (Pink - TRW)

Summary Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: August 20, 2001

Order ID Number: A01080602

Project Number: CC # V-102
Project Name: Duke Energy Field Services
Project Location: Linam Ranch Plant

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
176406	MW-7	Water	8/2/01	10:30	8/4/01
176407	MW-1	Water	8/2/01	11:20	8/4/01
176408	MW-2	Water	8/2/01	12:55	8/4/01
176409	MW-8	Water	8/2/01	15:15	8/4/01
176410	MW-3	Water	8/2/01	16:40	8/4/01
176411	MW-9	Water	8/2/01	17:30	8/4/01
176412	MW-12	Water	8/2/01	18:20	8/4/01
176413	MW-11	Water	8/2/01	8:55	8/4/01
176414	MW-10d	Water	8/2/01	9:50	8/4/01
176415	MW-10	Water	8/2/01	10:45	8/4/01
176416	MW-13	Water	8/2/01	11:30	8/4/01
176417	MW-5	Water	8/2/01	13:45	8/4/01
176418	Duplicate	Water	8/3/01	:	8/4/01
176419	Rinsate	Water	8/3/01	13:55	8/4/01
176420	Trip Blank	Water	8/3/01	:	8/4/01

This report consists of a total of 5 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX				
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)
176406 - MW-7	<0.005	<0.005	<0.005	<0.005	<0.005
176407 - MW-1	0.003	<0.001	<0.001	<0.001	0.003
176408 - MW-2	0.007	<0.001	<0.001	<0.001	0.007
176409 - MW-8	<0.001	<0.001	<0.001	<0.001	<0.001
176410 - MW-3	0.002	<0.001	<0.001	<0.001	0.002
176411 - MW-9	0.038	<0.001	<0.001	<0.001	0.038
176412 - MW-12	<0.001	<0.001	<0.001	<0.001	<0.001
176413 - MW-11	0.002	<0.001	<0.001	<0.001	0.002
176414 - MW-10d	<0.001	<0.001	<0.001	<0.001	<0.001
176415 - MW-10	1.64	<0.02	0.119	<0.02	1.76
176416 - MW-13	0.002	<0.001	<0.001	<0.001	0.002
176417 - MW-5	<0.005	<0.005	<0.005	<0.005	<0.005
176418 - Duplicate	0.001	<0.001	<0.001	<0.001	0.001
176419 - Rinsate	<0.001	<0.001	<0.001	<0.001	<0.001
176420 - Trip Blank	<0.001	<0.001	<0.001	<0.001	<0.001

Sample: 176406 - MW-7

Param	Flag	Result	Units
CL		94.5	mg/L
Nitrate-N	1	5.16	mg/L
Sulfate		89.5	mg/L
Total Dissolved Solids		646	mg/L
Total Aluminum		0.259	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		<0.10	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		<0.05	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 176407 - MW-1

Param	Flag	Result	Units
CL		80.6	mg/L
Nitrate-N		2.54	mg/L
Sulfate	2	268	mg/L
Total Dissolved Solids		1120	mg/L
Total Aluminum		0.286	mg/L
Total Arsenic		0.197	mg/L
Total Barium		<0.10	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		<0.05	mg/L
Total Manganese		0.194	mg/L
Total Silver		<0.0125	mg/L

Sample: 176408 - MW-2

Param	Flag	Result	Units
CL		45.7	mg/L
Nitrate-N		2.07	mg/L
Sulfate		14.6	mg/L
Total Dissolved Solids		412	mg/L
Total Aluminum		0.262	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.169	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		<0.05	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

[1]Sample out of hold time for NO3.

[2]Sulfate re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 97; CCV = 95; matrix spikes RPD = 2; matrix spikes %EA = 93; blank spikes RPD = 0; blank spikes %EA = 95.

Sample: 176409 - MW-8

Param	Flag	Result	Units
CL		21.5	mg/L
Nitrate-N		2.31	mg/L
Sulfate		26.7	mg/L
Total Dissolved Solids		400	mg/L
Total Aluminum		0.279	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.153	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		<0.05	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 176410 - MW-3

Param	Flag	Result	Units
CL		13.1	mg/L
Nitrate-N		3.07	mg/L
Sulfate		44.2	mg/L
Total Dissolved Solids		312	mg/L
Total Aluminum		0.265	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.472	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		<0.05	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 176411 - MW-9

Param	Flag	Result	Units
CL		52.9	mg/L
Nitrate-N		2.31	mg/L
Sulfate		74.6	mg/L
Total Dissolved Solids		616	mg/L
Total Aluminum		0.745	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.473	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		0.197	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 176412 - MW-12

Param	Flag	Result	Units
CL		118	mg/L

Continued on next page ...

Sample 176412 continued . . .

Param	Flag	Result	Units
Nitrate-N		2.17	mg/L
Sulfate		116	mg/L
Total Dissolved Solids		996	mg/L
Total Aluminum		0.196	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.481	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		<0.05	mg/L
Total Manganese		<0.025	mg/L
Total Silver		<0.0125	mg/L

Sample: 176413 - MW-11

Param	Flag	Result	Units
CL		51.1	mg/L
Nitrate-N		4.12	mg/L
Sulfate		95.7	mg/L
Total Dissolved Solids		835	mg/L
Total Aluminum		0.326	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.514	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		<0.05	mg/L
Total Manganese		0.143	mg/L
Total Silver		<0.0125	mg/L

Sample: 176414 - MW-10d

Param	Flag	Result	Units
CL	[3]	92.8	mg/L
Nitrate-N		<1.0	mg/L
Sulfate	[4]	300	mg/L
Total Dissolved Solids		1180	mg/L
Total Aluminum		0.26	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.527	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		1.19	mg/L
Total Manganese		0.477	mg/L
Total Silver		<0.0125	mg/L

[3]Chloride re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 94; CCV = 96; matrix spikes RPD = 2; matrix spikes %EA = 92; blank spikes RPD = 2; blank spikes %EA = 96.

[4]Sulfate re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 97; CCV = 95; matrix spikes RPD = 2; matrix spikes %EA = 93; blank spikes RPD = 0; blank spikes %EA = 95.

Sample: 176415 - MW-10

Param	Flag	Result	Units
CL		106	mg/L
Nitrate-N		<1.0	mg/L
Sulfate		206	mg/L
Total Dissolved Solids		1190	mg/L
Total Aluminum		0.341	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.507	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		0.492	mg/L
Total Manganese		0.482	mg/L
Total Silver		<0.0125	mg/L

Sample: 176416 - MW-13

Param	Flag	Result	Units
CL	[5]	339	mg/L
Nitrate-N		1.33	mg/L
Sulfate		126	mg/L
Total Dissolved Solids		1410	mg/L
Total Aluminum		0.302	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.442	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		0.0778	mg/L
Total Manganese		0.14	mg/L
Total Silver		<0.0125	mg/L

Sample: 176417 - MW-5

Param	Flag	Result	Units
CL	[6]	250	mg/L
Nitrate-N		<1.0	mg/L
Sulfate	[7]	805	mg/L
Total Dissolved Solids		2200	mg/L
Total Aluminum		0.317	mg/L
Total Arsenic		0.0737	mg/L
Total Barium		0.196	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Iron		16.8	mg/L
Total Manganese		1.11	mg/L
Total Silver		<0.0125	mg/L

[5] Chloride re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 94; CCV = 96; matrix spikes RPD = 2; matrix spikes %EA = 92; blank spikes RPD = 2; blank spikes %EA = 96.

[6] Chloride re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 94; CCV = 96; matrix spikes RPD = 2; matrix spikes %EA = 92; blank spikes RPD = 2; blank spikes %EA = 96.

[7] Sulfate re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 97; CCV = 95; matrix spikes RPD = 2; matrix spikes %EA = 93; blank spikes RPD = 0; blank spikes %EA = 95.

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Gil Van Deventer
Trident Environmental
P.O. Box 7624
Midland, Tx. 79708

Report Date: August 20, 2001

Order ID Number: A01080602

Project Number: CC # V-102
Project Name: Duke Energy Field Services
Project Location: Linam Ranch Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
176406	MW-7	Water	8/2/01	10:30	8/4/01
176407	MW-1	Water	8/2/01	11:20	8/4/01
176408	MW-2	Water	8/2/01	12:55	8/4/01
176409	MW-8	Water	8/2/01	15:15	8/4/01
176410	MW-3	Water	8/2/01	16:40	8/4/01
176411	MW-9	Water	8/2/01	17:30	8/4/01
176412	MW-12	Water	8/2/01	18:20	8/4/01
176413	MW-11	Water	8/2/01	8:55	8/4/01
176414	MW-10d	Water	8/2/01	9:50	8/4/01
176415	MW-10	Water	8/2/01	10:45	8/4/01
176416	MW-13	Water	8/2/01	11:30	8/4/01
176417	MW-5	Water	8/2/01	13:45	8/4/01
176418	Duplicate	Water	8/3/01	:	8/4/01
176419	Rinsate	Water	8/3/01	13:55	8/4/01
176420	Trip Blank	Water	8/3/01	:	8/4/01

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 27 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 176406 - MW-7

Analysis: BTEX | Analytical Method: S 8021B | QC Batch: QC13117 | Date Analyzed: 8/6/01
Analyst: CG | Preparation Method: E 5030B | Prep Batch: PB11205 | Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.46	mg/L	5	0.10	92	72 - 128
4-BFB		0.419	mg/L	5	0.10	83	72 - 128

Sample: 176406 - MW-7

Analysis: Ion Chromatography (IC) | Analytical Method: E 300.0 | QC Batch: QC13174 | Date Analyzed: 8/4/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11259 | Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		94.5	mg/L	5	0.50
Nitrate-N	[1]	5.16	mg/L	5	0.20
Sulfate		89.5	mg/L	5	0.50

Sample: 176406 - MW-7

Analysis: TDS | Analytical Method: E 160.1 | QC Batch: QC13220 | Date Analyzed: 8/10/01
Analyst: JS | Preparation Method: N/A | Prep Batch: PB11292 | Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		646	mg/L	1	10

Sample: 176406 - MW-7

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC13391 | Date Analyzed: 8/15/01
Analyst: RR | Preparation Method: E 3010A | Prep Batch: PB11314 | Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.259	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		<0.10	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		<0.05	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02

Continued ...

[1] Sample out of hold time for NO3.

... *Continued* Sample: 176406 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176407 - MW-1

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13117 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11205 Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.003	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.003	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0993	mg/L	1	0.10	99	72 - 128
4-BFB		0.0921	mg/L	1	0.10	92	72 - 128

Sample: 176407 - MW-1

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		80.6	mg/L	5	0.50
Nitrate-N		2.54	mg/L	5	0.20
Sulfate	[2]	268	mg/L	10	0.50

Sample: 176407 - MW-1

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13220 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1120	mg/L	2	10

Sample: 176407 - MW-1

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13391 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11314 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.286	mg/L	1	0.10
Total Arsenic		0.197	mg/L	1	0.05
Total Barium		<0.10	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02

Continued ...

[2]Sulfate re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 97; CCV = 95; matrix spikes RPD = 2; matrix spikes %EA = 93; blank spikes RPD = 0; blank spikes %EA = 95.

... Continued Sample: 176407 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		<0.05	mg/L	1	0.05
Total Manganese		0.194	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176408 - MW-2

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13117 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11205 Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.007	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.007	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0795	mg/L	1	0.10	80	72 - 128
4-BFB		0.0736	mg/L	1	0.10	74	72 - 128

Sample: 176408 - MW-2

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		45.7	mg/L	5	0.50
Nitrate-N		2.07	mg/L	5	0.20
Sulfate		14.6	mg/L	5	0.50

Sample: 176408 - MW-2

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13220 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		412	mg/L	1	10

Sample: 176408 - MW-2

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13391 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11314 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.262	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.169	mg/L	1	0.10

Continued ...

... *Continued* Sample: 176408 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		<0.05	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176409 - MW-8

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13117 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11205 Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Sample: 176409 - MW-8

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		21.5	mg/L	5	0.50
Nitrate-N		2.31	mg/L	5	0.20
Sulfate		26.7	mg/L	5	0.50

Sample: 176409 - MW-8

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13220 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		400	mg/L	1	10

Sample: 176409 - MW-8

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13391 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11314 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.279	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.153	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		<0.05	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176410 - MW-3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13117 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11205 Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.002	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.002	mg/L	1	0.001

Sample: 176410 - MW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		13.1	mg/L	5	0.50
Nitrate-N		3.07	mg/L	5	0.20
Sulfate		44.2	mg/L	5	0.50

Sample: 176410 - MW-3

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13221 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		312	mg/L	1	10

Sample: 176410 - MW-3

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13391 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11314 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.265	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.472	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		<0.05	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176411 - MW-9

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13118 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11206 Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.038	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001

Continued ...

... *Continued* Sample: 176411 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.038	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0889	mg/L	1	0.10	89	72 - 128
4-BFB		0.0854	mg/L	1	0.10	85	72 - 128

Sample: 176411 - MW-9

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		52.9	mg/L	5	0.50
Nitrate-N		2.31	mg/L	5	0.20
Sulfate		74.6	mg/L	5	0.50

Sample: 176411 - MW-9

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13221 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		616	mg/L	1	10

Sample: 176411 - MW-9

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13389 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11315 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.745	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.473	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		0.197	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176412 - MW-12

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13118 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11206 Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001

Continued ...

... Continued Sample: 176412 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0871	mg/L	1	0.10	87	72 - 128
4-BFB		0.0814	mg/L	1	0.10	81	72 - 128

Sample: 176412 - MW-12

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		118	mg/L	5	0.50
Nitrate-N		2.17	mg/L	5	0.20
Sulfate		116	mg/L	5	0.50

Sample: 176412 - MW-12

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13221 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		996	mg/L	2	10

Sample: 176412 - MW-12

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13389 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11315 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.196	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.481	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		<0.05	mg/L	1	0.05
Total Manganese		<0.025	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176413 - MW-11

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13118 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11206 Date Prepared: 8/6/01

Continued ...

... Continued Sample: 176413 Analysis: BTEX

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.002	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M.P.O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.002	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0891	mg/L	1	0.10	89	72 - 128
4-BFB		0.0824	mg/L	1	0.10	82	72 - 128

Sample: 176413 - MW-11

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		51.1	mg/L	5	0.50
Nitrate-N		4.12	mg/L	5	0.20
Sulfate		95.7	mg/L	5	0.50

Sample: 176413 - MW-11

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13221 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		835	mg/L	1	10

Sample: 176413 - MW-11

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13389 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11315 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.326	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.514	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		<0.05	mg/L	1	0.05
Total Manganese		0.143	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

Sample: 176414 - MW-10d

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC13118 Date Analyzed: 8/6/01
Analyst: CG Preparation Method: E 5030B Prep Batch: PB11206 Date Prepared: 8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0911	mg/L	1	0.10	91	72 - 128
4-BFB		0.0827	mg/L	1	0.10	83	72 - 128

Sample: 176414 - MW-10d

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC13174 Date Analyzed: 8/4/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11259 Date Prepared: 8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL	[3]	92.8	mg/L	10	0.50
Nitrate-N		<1.0	mg/L	5	0.20
Sulfate	[4]	300	mg/L	10	0.50

Sample: 176414 - MW-10d

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC13221 Date Analyzed: 8/10/01
Analyst: JS Preparation Method: N/A Prep Batch: PB11292 Date Prepared: 8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1180	mg/L	2	10

Sample: 176414 - MW-10d

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13389 Date Analyzed: 8/15/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11315 Date Prepared: 8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.26	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.527	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		1.19	mg/L	1	0.05
Total Manganese		0.477	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

[3]Chloride re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 94; CCV = 96; matrix spikes RPD = 2; matrix spikes %EA = 92; blank spikes RPD = 2; blank spikes %EA = 96.

[4]Sulfate re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 97; CCV = 95; matrix spikes RPD = 2; matrix spikes %EA = 93; blank spikes RPD = 0; blank spikes %EA = 95.

Sample: 176415 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13263	Date Analyzed:	8/10/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11286	Date Prepared:	8/9/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		1.64	mg/L	20	0.001
Toluene		<0.02	mg/L	20	0.001
Ethylbenzene		0.119	mg/L	20	0.001
M,P,O-Xylene		<0.02	mg/L	20	0.001
Total BTEX		1.76	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[5]	0.55	mg/L	20	0.10	27	72 - 128
4-BFB	[6]	0.492	mg/L	20	0.10	24	72 - 128

Sample: 176415 - MW-10

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC13174	Date Analyzed:	8/4/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11259	Date Prepared:	8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL		106	mg/L	5	0.50
Nitrate-N		<1.0	mg/L	5	0.20
Sulfate		206	mg/L	5	0.50

Sample: 176415 - MW-10

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13272	Date Analyzed:	8/13/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11323	Date Prepared:	8/10/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1190	mg/L	2	10

Sample: 176415 - MW-10

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13389	Date Analyzed:	8/15/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11315	Date Prepared:	8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.341	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.507	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		0.492	mg/L	1	0.05
Total Manganese		0.482	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

[5] Poor surrogate recovery due to matrix difficulties.
[6] Poor surrogate recovery due to matrix difficulties.

Sample: 176416 - MW-13

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13118	Date Analyzed:	8/6/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11206	Date Prepared:	8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.002	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.002	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0744	mg/L	1	0.10	74	72 - 128
4-BFB	[7]	0.0681	mg/L	1	0.10	68	72 - 128

Sample: 176416 - MW-13

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC13175	Date Analyzed:	8/4/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11259	Date Prepared:	8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL	[8]	339	mg/L	10	0.50
Nitrate-N		1.33	mg/L	5	0.20
Sulfate		126	mg/L	5	0.50

Sample: 176416 - MW-13

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13221	Date Analyzed:	8/10/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11292	Date Prepared:	8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1410	mg/L	2	10

Sample: 176416 - MW-13

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13389	Date Analyzed:	8/15/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11315	Date Prepared:	8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.302	mg/L	1	0.10
Total Arsenic		<0.05	mg/L	1	0.05
Total Barium		0.442	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		0.0778	mg/L	1	0.05
Total Manganese		0.14	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

[7] Poor surrogate recovery due to lack of mixing.

[8] Chloride re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 94; CCV = 96; matrix spikes RPD = 2; matrix spikes %EA = 92; blank spikes RPD = 2; blank spikes %EA = 96.

Sample: 176417 - MW-5

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13118	Date Analyzed:	8/6/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11206	Date Prepared:	8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.369	mg/L	5	0.10	73	72 - 128
4-BFB	[9]	0.324	mg/L	5	0.10	64	72 - 128

Sample: 176417 - MW-5

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC13175	Date Analyzed:	8/4/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11259	Date Prepared:	8/4/01

Param	Flag	Result	Units	Dilution	RDL
CL	[10]	250	mg/L	10	0.50
Nitrate-N		<1.0	mg/L	5	0.20
Sulfate	[11]	805	mg/L	50	0.50

Sample: 176417 - MW-5

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC13221	Date Analyzed:	8/10/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB11292	Date Prepared:	8/9/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		2200	mg/L	2	10

Sample: 176417 - MW-5

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13389	Date Analyzed:	8/15/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11315	Date Prepared:	8/13/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.317	mg/L	1	0.10
Total Arsenic		0.0737	mg/L	1	0.05
Total Barium		0.196	mg/L	1	0.10
Total Cadmium		<0.025	mg/L	1	0.02
Total Chromium		<0.01	mg/L	1	0.01
Total Iron		16.8	mg/L	1	0.05
Total Manganese		1.11	mg/L	1	0.02
Total Silver		<0.0125	mg/L	1	0.01

[9] Poor surrogate recovery due to matrix difficulties.

[10] Chloride re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 94; CCV = 96; matrix spikes RPD = 2; matrix spikes %EA = 92; blank spikes RPD = 2; blank spikes %EA = 96.

[11] Sulfate re-ran on IC080601-1.sch (PB11260; QC13176). ICV = 97; CCV = 95; matrix spikes RPD = 2; matrix spikes %EA = 93; blank spikes RPD = 0; blank spikes %EA = 95.

Sample: 176418 - Duplicate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13118	Date Analyzed:	8/6/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11206	Date Prepared:	8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0758	mg/L	1	0.10	76	72 - 128
4-BFB	[12]	0.0693	mg/L	1	0.10	69	72 - 128

Sample: 176419 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13118	Date Analyzed:	8/6/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11206	Date Prepared:	8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[13]	0.0648	mg/L	1	0.10	65	72 - 128
4-BFB	[14]	0.0596	mg/L	1	0.10	60	72 - 128

Sample: 176420 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13118	Date Analyzed:	8/6/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11206	Date Prepared:	8/6/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0712	mg/L	1	0.10	71	72 - 128

Continued ...

[12] Poor surrogate recovery due to lack of mixing.
[13] Poor surrogate recovery due to lack of mixing.
[14] Poor surrogate recovery due to lack of mixing.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
4-BFB	[15]	0.0674	mg/L	1	0.10	67	72 - 128

[15] Poor surrogate recovery due to lack of mixing.

Quality Control Report
Method Blank

Method Blank QCBatch: QC13117

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.105	mg/L	1	0.10	105	72 - 128
4-BFB		0.0958	mg/L	1	0.10	96	72 - 128

Method Blank QCBatch: QC13118

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0987	mg/L	1	0.10	99	72 - 128
4-BFB		0.0917	mg/L	1	0.10	92	72 - 128

Method Blank QCBatch: QC13174

Param	Flag	Results	Units	Reporting Limit
CL		<2.0	mg/L	0.50
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC13175

Param	Flag	Results	Units	Reporting Limit
CL		<2.0	mg/L	0.50

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Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank QCBatch: QC13220

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank QCBatch: QC13221

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank QCBatch: QC13263

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Method Blank QCBatch: QC13272

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank QCBatch: QC13389

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		0.469	mg/L	0.10
Total Arsenic		<0.05	mg/L	0.05
Total Barium		<0.1	mg/L	0.10
Total Cadmium		<0.025	mg/L	0.02
Total Chromium		<0.01	mg/L	0.01
Total Iron		<0.05	mg/L	0.05
Total Manganese		<0.025	mg/L	0.02
Total Silver		<0.0125	mg/L	0.01

Method Blank

QCBatch: QC13391

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		0.546	mg/L	0.10
Total Arsenic		<0.05	mg/L	0.05
Total Barium		<0.10	mg/L	0.10
Total Cadmium		<0.025	mg/L	0.02
Total Chromium		<0.01	mg/L	0.01
Total Iron		<0.05	mg/L	0.05
Total Manganese		<0.025	mg/L	0.02
Total Silver		<0.0125	mg/L	0.01

Quality Control Report
Duplicate Samples

Duplicate

QCBatch: QC13220

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1118	1120	mg/L	1	0	14

Duplicate

QCBatch: QC13221

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		2212	2200	mg/L	1	0	14

Duplicate

QCBatch: QC13272

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1188	1190	mg/L	1	0	14

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC13117

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.093	0.095	mg/L	1	0.10	<0.001	93	2	80 - 120	20
Benzene	0.098	0.098	mg/L	1	0.10	<0.001	98	0	80 - 120	20
Toluene	0.096	0.096	mg/L	1	0.10	<0.001	96	0	80 - 120	20
Ethylbenzene	0.096	0.096	mg/L	1	0.10	<0.001	96	0	80 - 120	20
M,P,O-Xylene	0.278	0.279	mg/L	1	0.30	<0.001	92	0	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.1	0.101	mg/L	1	0.10	100	101	72 - 128
4-BFB	0.096	0.094	mg/L	1	0.10	96	94	72 - 128

Laboratory Control Spikes QCBatch: QC13118

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.093	0.092	mg/L	1	0.10	<0.001	93	1	80 - 120	20
Benzene	0.095	0.094	mg/L	1	0.10	<0.001	95	1	80 - 120	20
Toluene	0.092	0.092	mg/L	1	0.10	<0.001	92	0	80 - 120	20
Ethylbenzene	0.092	0.092	mg/L	1	0.10	<0.001	92	0	80 - 120	20
M,P,O-Xylene	0.267	0.266	mg/L	1	0.30	<0.001	89	0	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.094	0.096	mg/L	1	0.10	94	96	72 - 128
4-BFB	0.090	0.092	mg/L	1	0.10	90	92	72 - 128

Laboratory Control Spikes QCBatch: QC13174

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	11.68	11.95	mg/L	1	12.50	<2.0	93	2	90 - 110	20
Nitrate-N	2.37	2.35	mg/L	1	2.50	<0.2	94	0	90 - 110	20
Sulfate	11.86	12.13	mg/L	1	12.50	<2.0	94	2	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes QCBatch: QC13175

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Nitrate-N	2.35	2.38	mg/L	1	2.50	<0.2	94	1	90 - 110	20
Sulfate	12.02	12.00	mg/L	1	12.50	<2.0	96	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes QCBatch: QC13263

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.11	0.109	mg/L	1	0.10	<0.001	110	0	80 - 120	20
Benzene	0.109	0.107	mg/L	1	0.10	<0.001	109	1	80 - 120	20

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Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Toluene	0.107	0.104	mg/L	1	0.10	<0.001	107	2	80 - 120	20
Ethylbenzene	0.107	0.104	mg/L	1	0.10	<0.001	107	2	80 - 120	20
M,P,O-Xylene	0.313	0.305	mg/L	1	0.30	<0.001	104	2	80 - 120	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
TFT	0.108	0.107	mg/L	1	0.10	108	107	72 - 128
4-BFB	0.103	0.102	mg/L	1	0.10	103	102	72 - 128

Laboratory Control Spikes

QCBatch: QC13389

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.44	1.36	mg/L	1	1	0.469	97	8	75 - 125	20
Total Arsenic	0.474	0.474	mg/L	1	0.50	<0.05	94	0	75 - 125	20
Total Barium	0.924	0.9	mg/L	1	1	<0.1	92	2	75 - 125	20
Total Cadmium	0.231	0.229	mg/L	1	0.25	<0.025	92	0	75 - 125	20
Total Chromium	0.0938	0.096	mg/L	1	0.10	<0.01	93	2	75 - 125	20
Total Iron	0.464	0.476	mg/L	1	0.50	<0.05	92	2	75 - 125	20
Total Manganese	0.232	0.227	mg/L	1	0.25	<0.025	92	2	75 - 125	20
Total Silver	0.115	0.111	mg/L	1	0.12	<0.0125	92	3	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC13391

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	0.829	0.793	mg/L	1	1	0.546	82	4	75 - 125	20
Total Arsenic	0.465	0.476	mg/L	1	0.50	<0.05	93	2	75 - 125	20
Total Barium	0.954	0.955	mg/L	1	1	<0.10	95	0	75 - 125	20
Total Beryllium	0.0234	0.0234	mg/L	1	0.02	<0.0025	93	0	75 - 125	20
Total Boron	0.06	0.06	mg/L	1	0.05	<0.01	120	0	75 - 125	20
Total Cadmium	0.24	0.24	mg/L	1	0.25	<0.025	96	0	75 - 125	20
Total Chromium	0.093	0.0937	mg/L	1	0.10	<0.01	93	0	75 - 125	20
Total Cobalt	0.232	0.235	mg/L	1	0.25	<0.025	92	1	75 - 125	20
Total Copper	0.123	0.124	mg/L	1	0.12	<0.0125	98	0	75 - 125	20
Total Iron	0.502	0.47	mg/L	1	0.50	<0.05	100	6	75 - 125	20
Total Lead	0.487	0.474	mg/L	1	0.50	<0.01	97	2	75 - 125	20
Total Manganese	0.244	0.239	mg/L	1	0.25	<0.025	97	2	75 - 125	20
Total Molybdenum	0.483	0.49	mg/L	1	0.50	<0.05	96	1	75 - 125	20
Total Nickel	0.223	0.225	mg/L	1	0.25	<0.025	89	0	75 - 125	20
Total Phosphorous	0.437	0.441	mg/L	1	0.50	<0.05	87	0	75 - 125	20
Total Selenium	0.434	0.424	mg/L	1	0.50	<0.05	86	2	75 - 125	20
Total Silica	0.507	0.485	mg/L	1	0.50	<0.05	101	4	75 - 125	20
Total Silver	0.116	0.116	mg/L	1	0.12	<0.0125	92	0	75 - 125	20
Total Strontium	0.052	0.052	mg/L	1	0.05	<0.01	104	0	75 - 125	20
Total Tin	0.324	0.313	mg/L	1	30	<0.025	1	3	75 - 125	20
Total Vanadium	0.236	0.237	mg/L	1	0.25	<0.025	94	0	75 - 125	20
Total Zinc	0.257	0.258	mg/L	1	0.25	<0.025	102	0	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes QCBatch: QC13174

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	164.26	162.96	mg/L	1	62.50	106	93	1	52 - 131	20
Nitrate-N	12.67	12.28	mg/L	1	12.50	<1.0	101	3	86 - 110	20
Sulfate	260.21	263.36	mg/L	1	62.50	206	86	1	71 - 121	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC13175

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Nitrate-N	12.84	12.74	mg/L	1	12.50	1.33	92	1	86 - 110	20
Sulfate	185.23	183.30	mg/L	1	62.50	126	94	1	71 - 121	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC13389

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.55	1.22	mg/L	1	1	0.745	80	51	75 - 125	20
Total Arsenic	0.466	0.474	mg/L	1	0.50	<0.05	93	1	75 - 125	20
Total Barium	1.42	1.36	mg/L	1	1	0.473	94	6	75 - 125	20
Total Cadmium	0.226	0.224	mg/L	1	0.25	<0.025	90	0	75 - 125	20
Total Chromium	0.0904	0.0878	mg/L	1	0.10	<0.01	90	2	75 - 125	20
Total Iron	[16] 0.466	[17] 0.46	mg/L	1	0.50	0.197	53	2	75 - 125	20
Total Manganese	0.255	0.246	mg/L	1	0.25	<0.025	102	3	75 - 125	20
Total Silver	0.121	0.116	mg/L	1	0.12	<0.0125	96	4	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes QCBatch: QC13391

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.54	1.51	mg/L	1	1	0.532	100	3	75 - 125	20
Total Arsenic	0.475	0.477	mg/L	1	0.50	<0.05	95	0	75 - 125	20

Continued ...

[16] Matrix spike recovery invalid due to matrix difficulties. LCS demonstrates process under control
[17] Matrix spike recovery invalid due to matrix difficulties. LCS demonstrates process under control.

... Continued

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Barium	0.96	0.948	mg/L	1	1	<0.10	96	1	75 - 125	20
Total Cadmium	0.223	0.222	mg/L	1	0.25	<0.025	89	0	75 - 125	20
Total Chromium	0.09	0.089	mg/L	1	0.10	<0.01	90	1	75 - 125	20
Total Iron	0.581	0.572	mg/L	1	0.50	0.131	90	2	75 - 125	20
Total Manganese	0.262	0.257	mg/L	1	0.25	0.028	93	2	75 - 125	20
Total Silver	0.122	0.119	mg/L	1	0.12	<0.0125	97	2	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1) QCBatch: QC13117

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.090	90	85 - 115	8/6/01
Benzene		mg/L	0.10	0.094	94	85 - 115	8/6/01
Toluene		mg/L	0.10	0.092	92	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.091	91	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.267	89	85 - 115	8/6/01

CCV (2) QCBatch: QC13117

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.094	94	85 - 115	8/6/01
Benzene		mg/L	0.10	0.097	97	85 - 115	8/6/01
Toluene		mg/L	0.10	0.094	94	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.094	94	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.273	91	85 - 115	8/6/01

ICV (1) QCBatch: QC13117

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.096	96	85 - 115	8/6/01
Benzene		mg/L	0.10	0.098	98	85 - 115	8/6/01
Toluene		mg/L	0.10	0.097	97	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.097	97	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.281	93	85 - 115	8/6/01

CCV (1) QCBatch: QC13118

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.097	97	85 - 115	8/6/01
Benzene		mg/L	0.10	0.096	96	85 - 115	8/6/01
Toluene		mg/L	0.10	0.093	93	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.093	93	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.272	90	85 - 115	8/6/01

CCV (2) QCBatch: QC13118

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.089	89	85 - 115	8/6/01
Benzene		mg/L	0.10	0.095	95	85 - 115	8/6/01
Toluene		mg/L	0.10	0.092	92	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.091	91	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.266	88	85 - 115	8/6/01

ICV (1) QCBatch: QC13118

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.091	91	85 - 115	8/6/01
Benzene		mg/L	0.10	0.094	94	85 - 115	8/6/01
Toluene		mg/L	0.10	0.091	91	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.091	91	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.266	88	85 - 115	8/6/01

CCV (1) QCBatch: QC13174

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.44	97	90 - 110	8/4/01
CL		mg/L	12.50	11.98	95	90 - 110	8/4/01
Fluoride		mg/L	2.50	2.36	94	90 - 110	8/4/01
Nitrate-N		mg/L	2.50	2.39	95	90 - 110	8/4/01
Sulfate		mg/L	12.50	12.09	96	90 - 110	8/4/01

ICV (1) QCBatch: QC13174

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.46	98	90 - 110	8/4/01
CL		mg/L	12.50	12.05	96	90 - 110	8/4/01
Fluoride		mg/L	2.50	2.35	94	90 - 110	8/4/01
Nitrate-N		mg/L	2.50	2.36	94	90 - 110	8/4/01
Sulfate		mg/L	12.50	11.95	95	90 - 110	8/4/01

CCV (1) QCBatch: QC13175

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.50	100	90 - 110	8/4/01
CL		mg/L	12.50	11.66	93	90 - 110	8/4/01
Fluoride		mg/L	2.50	2.34	93	90 - 110	8/4/01
Nitrate-N		mg/L	2.50	2.36	94	90 - 110	8/4/01
Sulfate		mg/L	12.50	12.14	97	90 - 110	8/4/01

ICV (1) QCBatch: QC13175

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.44	97	90 - 110	8/4/01
CL		mg/L	12.50	11.98	95	90 - 110	8/4/01
Fluoride		mg/L	2.50	2.36	94	90 - 110	8/4/01
Nitrate-N		mg/L	2.50	2.39	95	90 - 110	8/4/01
Sulfate		mg/L	12.50	12.09	96	90 - 110	8/4/01

CCV (1) QCBatch: QC13220

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1017	101	90 - 110	8/10/01

ICV (1) QCBatch: QC13220

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	970	97	90 - 110	8/10/01

CCV (1) QCBatch: QC13221

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1018	101	90 - 110	8/10/01

ICV (1) QCBatch: QC13221

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1017	101	90 - 110	8/10/01

CCV (1) QCBatch: QC13263

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.106	106	85 - 115	8/10/01
Benzene		mg/L	0.10	0.101	101	85 - 115	8/10/01
Toluene		mg/L	0.10	0.099	99	85 - 115	8/10/01
Ethylbenzene		mg/L	0.10	0.1	100	85 - 115	8/10/01
M,P,O-Xylene		mg/L	0.30	0.292	97	85 - 115	8/10/01

CCV (2) QCBatch: QC13263

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.101	101	85 - 115	8/10/01
Benzene		mg/L	0.10	0.095	95	85 - 115	8/10/01
Toluene		mg/L	0.10	0.093	93	85 - 115	8/10/01
Ethylbenzene		mg/L	0.10	0.093	93	85 - 115	8/10/01
M,P,O-Xylene		mg/L	0.30	0.273	91	85 - 115	8/10/01

ICV (1) QCBatch: QC13263

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.105	105	85 - 115	8/10/01
Benzene		mg/L	0.10	0.096	96	85 - 115	8/10/01
Toluene		mg/L	0.10	0.095	95	85 - 115	8/10/01
Ethylbenzene		mg/L	0.10	0.095	95	85 - 115	8/10/01
M,P,O-Xylene		mg/L	0.30	0.277	92	85 - 115	8/10/01

CCV (1) QCBatch: QC13272

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	995	99	90 - 110	8/13/01

ICV (1) QCBatch: QC13272

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	976	97	90 - 110	8/13/01

CCV (1) QCBatch: QC13389

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	2.32	92	90 - 110	8/15/01
Total Arsenic		mg/L	1	1.03	103	90 - 110	8/15/01
Total Barium		mg/L	2	2.07	103	90 - 110	8/15/01
Total Cadmium		mg/L	0.50	0.511	102	90 - 110	8/15/01
Total Chromium		mg/L	0.20	0.206	103	90 - 110	8/15/01
Total Iron		mg/L	1	1.03	103	90 - 110	8/15/01
Total Manganese		mg/L	0.50	0.51	102	90 - 110	8/15/01
Total Silver		mg/L	0.25	0.252	100	90 - 110	8/15/01

ICV (1) QCBatch: QC13389

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.91	95	90 - 110	8/15/01
Total Arsenic		mg/L	1	0.958	95	90 - 110	8/15/01
Total Barium		mg/L	2	1.92	96	90 - 110	8/15/01
Total Cadmium		mg/L	0.50	0.479	95	90 - 110	8/15/01
Total Chromium		mg/L	0.20	0.193	96	90 - 110	8/15/01
Total Iron		mg/L	1	0.957	95	90 - 110	8/15/01
Total Manganese		mg/L	0.50	0.479	95	90 - 110	8/15/01
Total Silver		mg/L	0.25	0.24	96	90 - 110	8/15/01

CCV (1) QCBatch: QC13391

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.815	90	90 - 110	8/15/01
Total Arsenic		mg/L	1	0.954	95	90 - 110	8/15/01
Total Barium		mg/L	2	1.945	97	90 - 110	8/15/01

Continued . . .

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Beryllium		mg/L	0.05	0.0489	97	90 - 110	8/15/01
Total Boron		mg/L	0.10	0.103	103	90 - 110	8/15/01
Total Cadmium		mg/L	0.50	0.494	98	90 - 110	8/15/01
Total Chromium		mg/L	0.20	0.195	97	90 - 110	8/15/01
Total Cobalt		mg/L	0.50	0.482	96	90 - 110	8/15/01
Total Copper		mg/L	0.25	0.241	96	90 - 110	8/15/01
Total Iron		mg/L	1	0.981	98	90 - 110	8/15/01
Total Lead		mg/L	1	0.963	96	90 - 110	8/15/01
Total Manganese		mg/L	0.50	0.485	97	90 - 110	8/15/01
Total Molybdenum		mg/L	1	0.978	97	90 - 110	8/15/01
Total Nickel		mg/L	0.50	0.476	95	90 - 110	8/15/01
Total Phosphorous		mg/L	1	0.969	96	90 - 110	8/15/01
Total Selenium		mg/L	1	0.983	98	90 - 110	8/15/01
Total Silica		mg/L	1	1	100	90 - 110	8/15/01
Total Silver		mg/L	0.25	0.245	98	90 - 110	8/15/01
Total Strontium		mg/L	0.10	0.097	97	90 - 110	8/15/01
Total Tin		mg/L	0.50	0.494	98	90 - 110	8/15/01
Total Vanadium		mg/L	0.50	0.484	96	90 - 110	8/15/01
Total Zinc		mg/L	0.50	0.495	99	90 - 110	8/15/01

ICV (1) QCBatch: QC13391

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.91	95	90 - 110	8/15/01
Total Arsenic		mg/L	1	0.958	95	90 - 110	8/15/01
Total Barium		mg/L	2	1.916	95	90 - 110	8/15/01
Total Beryllium		mg/L	0.05	0.0479	95	90 - 110	8/15/01
Total Boron		mg/L	0.10	0.0992	99	90 - 110	8/15/01
Total Cadmium		mg/L	0.50	0.479	95	90 - 110	8/15/01
Total Chromium		mg/L	0.20	0.193	96	90 - 110	8/15/01
Total Cobalt		mg/L	0.50	0.481	96	90 - 110	8/15/01
Total Copper		mg/L	0.25	0.24	96	90 - 110	8/15/01
Total Iron		mg/L	1	0.957	95	90 - 110	8/15/01
Total Lead		mg/L	1	0.963	96	90 - 110	8/15/01
Total Manganese		mg/L	0.50	0.479	95	90 - 110	8/15/01
Total Molybdenum		mg/L	1	0.975	97	90 - 110	8/15/01
Total Nickel		mg/L	0.50	0.482	96	90 - 110	8/15/01
Total Phosphorous		mg/L	1	0.965	96	90 - 110	8/15/01
Total Selenium		mg/L	1	0.989	98	90 - 110	8/15/01
Total Silica		mg/L	1	0.98	98	90 - 110	8/15/01
Total Silver		mg/L	0.25	0.24	96	90 - 110	8/15/01
Total Strontium		mg/L	0.10	0.096	96	90 - 110	8/15/01
Total Tin		mg/L	0.50	0.493	98	90 - 110	8/15/01
Total Vanadium		mg/L	0.50	0.479	95	90 - 110	8/15/01
Total Zinc		mg/L	0.50	0.484	96	90 - 110	8/15/01

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0701-1

Chain of Custody

Date 8-3-01 Page 1 of 2

Lab Name: TRACEANALYSIS, INC.
Address: 6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296
Telephone:

Samplers (SIGNATURES)

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	Ions: SO_4, NO_3, Cl, & TDS						Number of Containers
MW-7 176406	Water	8-2-01	1030		✓													✓	✓						4
MW-1 07	Water	8-2-01	1120		✓													✓	✓						4
MW-2 08	Water	8-2-01	1255		✓													✓	✓						4
MW-8 09	Water	8-2-01	1515		✓													✓	✓						4
MW-3 10	Water	8-2-01	1640		✓													✓	✓						4
MW-9 11	Water	8-2-01	1730		✓													✓	✓						4
MW-12 12	Water	8-2-01	1820		✓													✓	✓						4
MW-11 13	Water	8-3-01	0855		✓													✓	✓						4
MW-10d 14	Water	8-3-01	0950		✓													✓	✓						4
MW-10 15	Water	8-3-01	1045		✓													✓	✓						4

Project Information

Project Name:	Duke Energy Field Services
Project Location:	Linam Ranch Plant
Project Manager:	Gil Van Deventer
Cost Center No.:	V-102
Shipping ID No.:	
Bill to (see below):	

Sample Receipt

Total Containers:	
COC Seals:	
Rec'd Good Cond/Cold:	
Conforms to Records:	
Lab No.:	

Special Instructions/Comments: Please send invoice direct to client:
uke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Gilbert Van Deventer	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) 8/3/01 (Time) 3:00 pm	(Date) (Time)	(Date) (Time)
Received By: (1) (Company) Trace Analysis	**Received By: (2) (Company)**	**Received By: (3) (Company)**
(Printed Name) Jennifer Schmidt	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) 8/4/01 (Time) 10:00 AM	(Date) (Time)	(Date) (Time)

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BLS 902674500 2

Trident Environmental
P.O. Box 7624
Midland, Texas 79708
(915) 682-0808
(915) 682-0727 (Fax)

V-102-0701-2

Chain of Custody

Date 8-3-01 Page 2 of 2

Lab Name: TRACEANALYSIS, INC.
Address: 6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296
Telephone:

Samplers (SIGNATURES)

Sample Identification	Matrix	Date	Time	Sample Type: G - Grab, C- Composite	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	TCLP Metals	Total Metals: Ag,Al,As,Ba,Cd,Cr,Fe, & Mn	Ions: SO_4, NO_3, Cl, & TDS						Number of Containers
MW-13 176416	Water	8-3-01	1130		✓													✓	✓						4
MW-5 17	Water	8-3-01	1345		✓													✓	✓						4
Duplicate 18	Water	8-3-01	0000		✓																				2
Rinsate 19	Water	8-3-01	1355		✓																				2
Trip Blank 829 A/B (20)	Water	—	—		✓																				2

Project Information		Sample Receipt	
Project Name:	Duke Energy Field Services	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	
Cost Center No.:	V-102	Conforms to Records:	
Shipping ID No.:		Lab No.:	
Bill to (see below):			

Special Instructions/Comments: Please send invoice direct to client:
uke Energy Field Svcs, Attn: Steve Weathers, PO Box 5493, Denver, CO 80217

Relinquished By: (1) (Company)	Relinquished By: (2) (Company)	Relinquished By: (3) (Company)
Trident Environmental		
(Printed Name) Gilbert Van Deventer	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) 8/3/01 (Time) 3:00pm	(Date) (Time)	(Date) (Time)
Received By: (1) (Company)	**Received By: (2) (Company)**	**Received By: (3) (Company)**
Trace Analysis		
(Printed Name) Jennifer Schmidt	(Printed Name)	(Printed Name)
(Signature)	(Signature)	(Signature)
(Date) 8/4/01 (Time) 10:50 AM	(Date) (Time)	(Date) (Time)

Copy signed original form for Trident Environmental records

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R.C 9026074500 2

APPENDIX B

MONITORING WELL

SAMPLING DATA SHEETS

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -1

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON/GIL VAN DEVENTER

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 53.15 Feet

DEPTH TO WATER: 44.67 Feet

HEIGHT OF WATER COLUMN: 8.48 Feet X 0.163 X 3 (Well Volumes) = 4.15 Minimum Gallons To Purge

WELL DIAMETER: ☑ 2-Inch ☐ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
955							PUMP ON!
957	1	18.8	3000	6.71	0.96	33	
959	2	18.8	2960	6.70	0.40	17	
1002	3	18.8	2870	6.71	0.46	14	
1004	4	18.8	2810	6.72	0.24	13	
1006	5	18.8	2810	6.72	0.13	12	PUMP OFF!

COMMENTS: Collected sample #0102071010 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -2

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON/GIL VAN DEVENTER

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 50.31 Feet

DEPTH TO WATER: 43.19 Feet

HEIGHT OF WATER COLUMN: 7.12 Feet X 0.163 X 3 (Well Volumes) = 3.48 Minimum Gallons To Purge

WELL DIAMETER: ☑ 2-Inch ☐ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0748							PUMP ON!
0751	1	17.6	663	8.6	1.06	999	
0754	2	17.5	672	8.51	3.71	601	
0757	3	18.4	644	8.51	3.45	75	
0800	4	18.6	633	8.53	3.36	69	PUMP OFF!
		17.6	654	7.36	3.04		Readings taken from 5 gallon bucket. Calibration cup left in flow through cell during purging.

COMMENTS: Collected sample #0102070815 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -3

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON/GIL VAN DEVENTER

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 55.12 Feet

DEPTH TO WATER: 48.22 Feet

HEIGHT OF WATER COLUMN: 6.90 Feet X 0.163 X 3 (Well Volumes) = 3.37 Minimum Gallons To Purge

WELL DIAMETER: ☑ 2-Inch ☐ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1023							PUMP ON!
1029	1	18.9	403	7.56	7.60	16	
1031	2	18.9	415	7.56	7.39	14	
1033	3	19	432	7.55	6.96	11	
1035	4	19	437	7.55	6.78	11	
1037	5	19.1	440	7.55	6.78	12	PUMP OFF!

COMMENTS: Collected sample #0102071040 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -5

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 8, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 55.03 Feet

DEPTH TO WATER: 48.36 Feet

HEIGHT OF WATER COLUMN: 6.67 Feet X 0.653 X 3 (Well Volumes) = 13.07 Minimum Gallons To Purge

WELL DIAMETER: ☐ 2-Inch ☑ 4-Inch

0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0952							PUMP ON!
0957	3	22.1	2380	6.49	0.03	2	
1003	6	22.1	2350	6.49	0.01	1	
1009	9	22.2	2350	6.49	0.01	1	
1015	12	22.2	2340	6.49	0.02	1	PUMP OFF!

COMMENTS: Collected sample #0102081025 for BTEX 8021B and NO_3 & SO_4.

Collected rinsate sample #0102081055 for BTEX 8021B.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -7

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: GIL VAN DEVENTER

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 62.40 Feet

DEPTH TO WATER: 56.66 Feet

HEIGHT OF WATER COLUMN: 5.74 Feet X 0.163 X 3 (Well Volumes) = 2.81 Minimum Gallons To Purge

WELL DIAMETER: ☑ 2-Inch ☐ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
800	3	15.3	1000	7.35	9.82	300	

COMMENTS: Collected sample #0102070800 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -8

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON/GIL VAN DEVENTER

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 58.11 Feet
DEPTH TO WATER: 43.58 Feet
HEIGHT OF WATER COLUMN: 14.53 Feet X 0.653 X 3 (Well Volumes) = 28.45 Minimum Gallons To Purge
WELL DIAMETER: ☐ 2-Inch ☑ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
851							PUMP ON!
856	5	18.4	631	6.93	3.88	10	
910	10	18.8	617	7.05	0.4	10	
917	15	18.8	617	7.06	2.30	9	
925	20	18.8	617	7.08	2.8	9	
935	25	18.9	617	7.08	2.67	9	PUMP OFF!

COMMENTS: Collected sample #0102070940 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -9

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON/GIL VAN DEVENTER

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 58.90 Feet

DEPTH TO WATER: 51.62 Feet

HEIGHT OF WATER COLUMN: 7.28 Feet X 0.163 X 3 (Well Volumes) = 3.56 Minimum Gallons To Purge

WELL DIAMETER: ☑ 2-Inch ☐ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1059							PUMP ON!
1101	1	19.3	1090	7.02	2.04	48	
1103	2	19.3	910	7.02	1.39	26	
1105	3	19.4	910	7.01	0.87	13	
1107	4	19.4	910	7.01	0.60	16	
1109	5	19.4	910	7.01	0.48	9	PUMP OFF!

COMMENTS: Collected sample #0102071115 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -10

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 8, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 64.97 Feet

DEPTH TO WATER: 51.54 Feet

HEIGHT OF WATER COLUMN: 13.43 Feet X 0.653 X 3 (Well Volumes) = 26.31 Minimum Gallons To Purge

WELL DIAMETER: ☐ 2-Inch ☑ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
0835							PUMP ON!
0843	5	19.2	1600	6.53	0.00	7	
0853	10	19.3	1670	6.63	0.07	3	
0903	15	19.3	1690	6.67	0.04	3	
0913	20	19.4	1690	6.69	0.00	3	
0924	25	19.4	1690	6.70	0.00	2	PUMP OFF!

COMMENTS: Collected sample #0102080935 for BTEX 8021B and NO_3 & SO_4.

Collected duplicate sample #0102070000 for BTEX 8021B.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -10d

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON/GIL VAN DEVENTER

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 78.44 Feet

DEPTH TO WATER: 52.57 Feet

HEIGHT OF WATER COLUMN: 25.87 Feet X 0.163 X 3 (Well Volumes) = 12.65 Minimum Gallons To Purge

WELL DIAMETER: ☑ 2-Inch ☐ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1130							PUMP ON!
1135	3	19.6	1580	6.98	0.58	10	
1140	6	19.6	1540	6.9	0.15	10	
1147	9	19.6	1520	6.86	0.11	9	
1154	12	19.6	1510	6.85	0.06	9	
1202	15	19.6	1510	6.84	0.02	9	PUMP OFF!

COMMENTS: Collected sample #0102071200 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -11

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 20001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 62.69 Feet

DEPTH TO WATER: 52.31 Feet

HEIGHT OF WATER COLUMN: 10.38 Feet X 0.653 X 3 (Well Volumes) = 20.33 Minimum Gallons To Purge

WELL DIAMETER: ☐ 2-Inch ☑ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1450							PUMP ON!
1500	5	20.0	1240	6.73	0.31	21	
1530	10	20.0	1230	6.72	0.37	13	Primary pump malfunctioned. Switched to backup pump.
1540	15	19.9	1230	6.72	0.10	10	
1550	20	19.9	1230	6.72	0.07	11	PUMP OFF!

COMMENTS: Collected sample #0102071600 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -12

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 59.14 Feet

DEPTH TO WATER: 51.34 Feet

HEIGHT OF WATER COLUMN: 7.80 Feet X 0.653 X 3 (Well Volumes) = 15.28 Minimum Gallons To Purge

WELL DIAMETER: ☐ 2-Inch ☑ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1340							PUMP ON!
1347	3	19.3	1300	6.70	0.16	19	
1356	6	19.1	1490	6.72	0.78	13	
1404	9	19.1	1550	6.73	0.39	10	
1413	12	19.1	1560	6.73	0.27	8	
1420	15	19.1	1570	6.73	0.22	8	PUMP OFF!
							FLOW RATE = 0.38 GAL/MIN

COMMENTS: Collected sample #0102071425 for BTEX 8021B and NO_3 & SO_4.

WELL SAMPLING DATA FORM

CLIENT: DUKE ENERGY FIELD SERVICES

WELL ID: MW -13

SITE NAME: LINAM RANCH GAS PLANT

DATE: FEBRUARY 7, 2001

PROJECT NO. P/6494/2AC

SAMPLER: J. FERGERSON/GIL VAN DEVENTER

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2-Stage Super Purger Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☑ Surface Discharge ☐ Drums ☐ Disposal Facility ☐ Other

TOTAL DEPTH OF WELL: 62.87 Feet

DEPTH TO WATER: 53.11 Feet

HEIGHT OF WATER COLUMN: 9.76 Feet X 0.653 X 3 (Well Volumes) = 19.11 Minimum Gallons To Purge

WELL DIAMETER: ☐ 2-Inch ☑ 4-Inch 0.163 (2"), 0.653 (4"), or 1.47 (6")

TIME	VOLUME PURGED	TEMP. °C / °F	COND. uS/cm	pH	DO mg/L	Turb	PHYSICAL APPEARANCE AND REMARKS
1622							PUMP ON!
1635	5	19.0	1380	6.79	0.69	10	
1646	10	18.9	1450	6.80	0.31	10	
1656	15	18.9	1480	6.82	0.23	9	
1706	20	18.9	1480	6.83	0.17	11	PUMP OFF!

COMMENTS: Collected sample #0102071715 for BTEX 8021B and NO_3 & SO_4.

Collected duplicate sample #0102070000 for BTEX 8021B.

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.15 Feet
DEPTH TO WATER: 45.37 Feet
HEIGHT OF WATER COLUMN: 7.78 Feet
WELL DIAMETER: 2.0 Inch

3.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:48	0	-	-	-	-	-	Pump On
10:51	3	23.1	2.02	7.41	1.94	95	
10:53	6	20.9	1.79	7.42	2.11	-	
10:56	9	21	1.73	7.37	1.88	999	
10:59	12	20.6	1.71	7.35	1.97	986	
11:01	15	20.4	1.7	7.32	2.04	195	Pump Off
0:13	:Total Time (hr:min)		**15**	:Total Vol (gal)		**1.15**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1120

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 50.31 Feet
DEPTH TO WATER: 44.55 Feet
HEIGHT OF WATER COLUMN: 5.76 Feet
WELL DIAMETER: 2.0 Inch

2.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
11:52	0	-	-	-	-	-	Pump On
12:05	2	27.4	0.683	7.76	4.56	925	
12:19	4	29.1	0.665	7.6	3.63	-	
12:43	6	29.2	0.651	7.65	4.37	-	Pump Off
0:51	:Total Time (hr:min)		**6**	:Total Vol (gal)		**0.12**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1255

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-3**

SITE NAME: Linam Ranch Gas Plant

DATE: 8/2/01

PROJECT NO. V-102

SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.12 Feet
DEPTH TO WATER: 48.39 Feet
HEIGHT OF WATER COLUMN: 6.73 Feet
WELL DIAMETER: 2.0 Inch

3.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
15:56	0	-	-	-	-	-	Pump On
15:50	3	23.2	0.451	8.29	8.67	279	
15:58	6	23.1	0.452	8.18	8.84	7	
16:05	9	22.9	0.45	8.17	8.80	0	
16:11	12	22.0	0.458	8.15	8.82	0	
16:17	15	22.3	0.462	8.15	8.79	0	Pump Off
0:27	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.55**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1640

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.03 Feet
DEPTH TO WATER: 48.78 Feet
HEIGHT OF WATER COLUMN: 6.25 Feet
WELL DIAMETER: 4.0 Inch

12.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
13:19	0	-	-	-	-	-	Pump On
13:21	5	25.1	2.69	7.09	2.07	15	
13:24	10	24.1	2.77	7.05	2.13	5	
13:27	15	23.8	2.77	7.01	2.61	3	
13:30	20	23.6	2.82	6.99	2.56	11	
13:34	25	23.7	2.85	7.01	2.71	6	Pump Off
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 1345

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-7**

SITE NAME: Linam Ranch Gas Plant

DATE: 8/2/01

PROJECT NO. V-102

SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.40 Feet
DEPTH TO WATER: 58.15 Feet
HEIGHT OF WATER COLUMN: 4.25 Feet
WELL DIAMETER: 2.0 Inch

2.1 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
	1	21.1	1.04	6.95	7.64	42	
0:00	:Total Time (hr:min)		**1**	:Total Vol (gal)		**#DIV/0!**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1030

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS: _____

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.11 Feet
DEPTH TO WATER: 44.92 Feet
HEIGHT OF WATER COLUMN: 13.19 Feet
WELL DIAMETER: 4.0 Inch

25.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
14:39	0	-	-	-	-	-	Pump On
14:41	5	21.9	0.668	7.91	6.31	-	
14:43	10	20.5	0.634	7.24	6.36	-	
14:46	15	20.0	0.622	7.22	5.48	-	
14:49	20	21.0	0.606	7.11	4.96	36	
14:51	25	19.6	0.604	7.21	4.84	22	
14:54	30	19.4	0.607	7.28	4.62	19	
14:56	35	19.4	0.606	7.32	4.67	11	
14:59	40	19.3	0.607	7.38	4.70	7	Pump Off
0:20	:Total Time (hr:min)		**40**	:Total Vol (gal)		**1.99**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1515

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.90 Feet
DEPTH TO WATER: 51.86 Feet
HEIGHT OF WATER COLUMN: 7.04 Feet
WELL DIAMETER: 2.0 Inch

3.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
16:54	0	-	-	-	-	-	Pump On
17:00	3	23.2	0.97	7.73	1.96	9	
17:06	6	22.4	0.95	7.65	1.81	0	
17:11	9	22.1	0.95	7.63	1.66	0	
17:16	12	22.1	0.95	7.63	1.61	0	Pump Off
0:22	:Total Time (hr:min)		**12**	:Total Vol (gal)		**0.54**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1730

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.97 Feet
DEPTH TO WATER: 51.84 Feet
HEIGHT OF WATER COLUMN: 13.13 Feet
WELL DIAMETER: 4.0 Inch

25.7 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:09	0	-	-	-	-	-	Pump On
10:12	5	21.7	1.77	7.85	2.47	64	
10:15	10	20.8	1.71	7.74	2.35	11	
10:18	15	20.7	1.73	7.75	2.24	9	
10:21	20	20.6	1.74	7.81	2.44	9	
10:24	25	20.6	1.74	7.80	2.34	8	Pump Off
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 1045

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-10D**

SITE NAME: Linam Ranch Gas Plant

DATE: 8/3/01

PROJECT NO. V-102

SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 78.44 Feet
DEPTH TO WATER: 52.78 Feet
HEIGHT OF WATER COLUMN: 25.66 Feet
WELL DIAMETER: 2.0 Inch

12.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
9:17	0	-	-	-	-	-	Pump On
9:19	3	21.7	1.62	7.68	1.46	254	
9:22	6	20.8	1.59	7.53	1.66	32	
9:25	9	20.8	1.57	7.52	1.83	60	
9:28	12	20.7	1.57	7.49	1.68	87	
9:30	15	20.7	1.56	7.48	1.88	62	Pump Off
0:13	:Total Time (hr:min)		**15**	:Total Vol (gal)		**1.15**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 0950

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.69 Feet
DEPTH TO WATER: 52.74 Feet
HEIGHT OF WATER COLUMN: 9.95 Feet
WELL DIAMETER: 4.0 Inch

19.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
8:14	0	-	-	-	-	-	Pump On
8:17	5	20.5	1.23	6.74	2.61	26	
8:20	10	20.2	1.25	6.77	2.58	4	
8:23	15	20.2	1.24	6.85	2.79	1	
8:26	20	20.2	1.25	6.90	2.56	1	
8:29	25	20.2	1.24	6.96	2.72	1	
8:31	30	20.2	1.25	6.99	2.46	1	Pump Off
0:17	:Total Time (hr:min)		**30**	:Total Vol (gal)		**1.76**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 0855

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-12**

SITE NAME: Linam Ranch Gas Plant

DATE: 8/2/01

PROJECT NO. V-102

SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 59.14 Feet
DEPTH TO WATER: 51.77 Feet
HEIGHT OF WATER COLUMN: 7.37 Feet
WELL DIAMETER: 4.0 Inch

14.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
17:46	0	-	-	-	-	-	Pump On
17:49	5	20.9	1.60	7.39	2.64	47	
17:52	10	20.1	1.60	7.36	2.59	15	
17:55	15	19.9	1.62	7.34	2.25	0	
17:58	20	19.9	1.66	7.34	2.23	0	
18:01	25	19.8	1.66	7.33	2.06	0	Pump Off
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1820

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services

WELL ID: **MW-13**

SITE NAME: Linam Ranch Gas Plant

DATE: 8/3/01

PROJECT NO. V-102

SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.87 Feet
DEPTH TO WATER: 53.41 Feet
HEIGHT OF WATER COLUMN: 9.46 Feet
WELL DIAMETER: 4.0 Inch

18.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
11:00	0	-	-	-	-	-	Pump On
11:04	5	21.6	1.43	7.56	2.54	81	
11:07	10	20.5	1.54	7.55	2.74	17	
11:10	15	20.2	1.56	7.52	2.41	8	
11:14	20	20.2	1.60	7.53	2.60	6	
11:17	25	20.2	1.61	7.51	2.63	11	Pump Off
0:17	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.47**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 1130

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-8**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.11 Feet
DEPTH TO WATER: 44.92 Feet
HEIGHT OF WATER COLUMN: 13.19 Feet
WELL DIAMETER: 4.0 Inch

25.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
14:39	0	-	-	-	-	-	Pump On
14:41	5	21.9	0.668	7.91	6.31	-	
14:43	10	20.5	0.634	7.24	6.36	-	
14:46	15	20.0	0.622	7.22	5.48	-	
14:49	20	21.0	0.606	7.11	4.96	36	
14:51	25	19.6	0.604	7.21	4.84	22	
14:54	30	19.4	0.607	7.28	4.62	19	
14:56	35	19.4	0.606	7.32	4.67	11	
14:59	40	19.3	0.607	7.38	4.70	7	Pump Off
0:20	:Total Time (hr:min)		**40**	:Total Vol (gal)		**1.99**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1515

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-9**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 58.90 Feet
DEPTH TO WATER: 51.86 Feet
HEIGHT OF WATER COLUMN: 7.04 Feet
WELL DIAMETER: 2.0 Inch

3.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
16:54	0	-	-	-	-	-	Pump On
17:00	3	23.2	0.97	7.73	1.96	9	
17:06	6	22.4	0.95	7.65	1.81	0	
17:11	9	22.1	0.95	7.63	1.66	0	
17:16	12	22.1	0.95	7.63	1.61	0	Pump Off
0:22	:Total Time (hr:min)		**12**	:Total Vol (gal)		**0.54**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1730

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 64.97 Feet
DEPTH TO WATER: 51.84 Feet
HEIGHT OF WATER COLUMN: 13.13 Feet
WELL DIAMETER: 4.0 Inch

25.7 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:09	0	-	-	-	-	-	Pump On
10:12	5	21.7	1.77	7.85	2.47	64	
10:15	10	20.8	1.71	7.74	2.35	11	
10:18	15	20.7	1.73	7.75	2.24	9	
10:21	20	20.6	1.74	7.81	2.44	9	
10:24	25	20.6	1.74	7.80	2.34	8	Pump Off
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 1045

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-10D**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 78.44 Feet
DEPTH TO WATER: 52.78 Feet
HEIGHT OF WATER COLUMN: 25.66 Feet
WELL DIAMETER: 2.0 Inch

12.6 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m* S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
9:17	0	-	-	-	-	-	Pump On
9:19	3	21.7	1.62	7.68	1.46	254	
9:22	6	20.8	1.59	7.53	1.66	32	
9:25	9	20.8	1.57	7.52	1.83	60	
9:28	12	20.7	1.57	7.49	1.68	87	
9:30	15	20.7	1.56	7.48	1.88	62	Pump Off
0:13	:Total Time (hr:min)		**15**	:Total Vol (gal)		**1.15**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 0950

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-11**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.69 Feet
DEPTH TO WATER: 52.74 Feet
HEIGHT OF WATER COLUMN: 9.95 Feet
WELL DIAMETER: 4.0 Inch

19.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
8:14	0	-	-	-	-	-	Pump On
8:17	5	20.5	1.23	6.74	2.61	26	
8:20	10	20.2	1.25	6.77	2.58	4	
8:23	15	20.2	1.24	6.85	2.79	1	
8:26	20	20.2	1.25	6.90	2.56	1	
8:29	25	20.2	1.24	6.96	2.72	1	
8:31	30	20.2	1.25	6.99	2.46	1	Pump Off
0:17	:Total Time (hr:min)		**30**	:Total Vol (gal)		**1.76**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 0855

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-12**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 59.14 Feet
DEPTH TO WATER: 51.77 Feet
HEIGHT OF WATER COLUMN: 7.37 Feet
WELL DIAMETER: 4.0 Inch

14.4 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
17:46	0	-	-	-	-	-	Pump On
17:49	5	20.9	1.60	7.39	2.64	47	
17:52	10	20.1	1.60	7.36	2.59	15	
17:55	15	19.9	1.62	7.34	2.25	0	
17:58	20	19.9	1.66	7.34	2.23	0	
18:01	25	19.8	1.66	7.33	2.06	0	Pump Off
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1820

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-13**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.87 Feet
DEPTH TO WATER: 53.41 Feet
HEIGHT OF WATER COLUMN: 9.46 Feet
WELL DIAMETER: 4.0 Inch

18.5 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
11:00	0	-	-	-	-	-	Pump On
11:04	5	21.6	1.43	7.56	2.54	81	
11:07	10	20.5	1.54	7.55	2.74	17	
11:10	15	20.2	1.56	7.52	2.41	8	
11:14	20	20.2	1.60	7.53	2.60	6	
11:17	25	20.2	1.61	7.51	2.63	11	Pump Off
0:17	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.47**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 1130

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-1**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 53.15 Feet
DEPTH TO WATER: 45.37 Feet
HEIGHT OF WATER COLUMN: 7.78 Feet
WELL DIAMETER: 2.0 Inch

3.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
10:48	0	-	-	-	-	-	Pump On
10:51	3	23.1	2.02	7.41	1.94	95	
10:53	6	20.9	1.79	7.42	2.11	-	
10:56	9	21.0	1.73	7.37	1.88	999	
10:59	12	20.6	1.71	7.35	1.97	986	
11:01	15	20.4	1.70	7.32	2.04	195	Pump Off
0:13	:Total Time (hr:min)		**15**	:Total Vol (gal)		**1.15**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1120

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-2**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 50.31 Feet
DEPTH TO WATER: 44.55 Feet
HEIGHT OF WATER COLUMN: 5.76 Feet
WELL DIAMETER: 2.0 Inch

2.8 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
11:52	0	-	-	-	-	-	Pump On
12:05	2	27.4	0.683	7.76	4.56	925	
12:19	4	29.1	0.665	7.60	3.63	-	
12:43	6	29.2	0.651	7.65	4.37	-	Pump Off
0:51	:Total Time (hr:min)		**6**	:Total Vol (gal)		**0.12**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1255

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-3**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.12 Feet
DEPTH TO WATER: 48.39 Feet
HEIGHT OF WATER COLUMN: 6.73 Feet
WELL DIAMETER: 2.0 Inch

3.3 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
15:56	0	-	-	-	-	-	Pump On
15:50	3	23.2	0.451	8.29	8.67	279	
15:58	6	23.1	0.452	8.18	8.84	7	
16:05	9	22.9	0.450	8.17	8.80	0	
16:11	12	22.0	0.458	8.15	8.82	0	
16:17	15	22.3	0.462	8.15	8.79	0	Pump Off
0:27	:Total Time (hr:min)		**15**	:Total Vol (gal)		**0.55**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1640

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-5**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/3/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☐ Hand Bailed ☑ Pump If Pump, Type: 2" Grundfos Pump

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other:

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other:

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 55.03 Feet
DEPTH TO WATER: 48.78 Feet
HEIGHT OF WATER COLUMN: 6.25 Feet
WELL DIAMETER: 4.0 Inch

12.2 Minimum Gallons to purge 3 well volumes (Water Column Height x 1.96)

TIME	VOLUME PURGED	TEMP. °C	COND. *m*S/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
13:19	0	-	-	-	-	-	Pump On
13:21	5	25.10	2.69	7.09	2.07	15	
13:24	10	24.10	2.77	7.05	2.13	5	
13:27	15	23.80	2.77	7.01	2.61	3	
13:30	20	23.60	2.82	6.99	2.56	11	
13:34	25	23.70	2.85	7.01	2.71	6	Pump Off
0:15	:Total Time (hr:min)		**25**	:Total Vol (gal)		**1.66**	:Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010803 1345

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS:

WELL SAMPLING DATA FORM

CLIENT: Duke Energy Field Services
WELL ID: **MW-7**
SITE NAME: Linam Ranch Gas Plant
DATE: 8/2/01
PROJECT NO. V-102
SAMPLER: Fergerson / Van Deventer

PURGING METHOD: ☑ Hand Bailed ☐ Pump If Pump, Type: _____

SAMPLING METHOD: ☑ Disposable Bailer ☐ Direct from Discharge Hose ☐ Other: _____

DESCRIBE EQUIPMENT DECONTAMINATION METHOD BEFORE SAMPLING THE WELL:

☑ Gloves ☑ Alconox ☑ Distilled Water Rinse ☐ Other: _____

DISPOSAL METHOD OF PURGE WATER: ☐ Surface Discharge ☐ Drums ☑ Disposal Facility

TOTAL DEPTH OF WELL: 62.40 Feet
DEPTH TO WATER: 58.15 Feet
HEIGHT OF WATER COLUMN: 4.25 Feet
WELL DIAMETER: 2.0 Inch

2.1 Minimum Gallons to purge 3 well volumes (Water Column Height x 0.49)

TIME	VOLUME PURGED	TEMP. °C	COND. mS/cm	pH	DO ppm	Turb	PHYSICAL APPEARANCE AND REMARKS
	1	21.1	1.04	6.95	7.64	42	
0:00 :Total Time (hr:min)			**1** :Total Vol (gal)				Flow Rate (gal/min)

SAMPLE NO.: Collected Sample No.: 010802 1030

ANALYSES: BTEX (8021B), Cl, NO3-N, SO4, TDS, Ag, Al, As, Ba, Cd, Cr, Fe, Mn.

COMMENTS: _____

2000 Annual Groundwater Sampling and Monitoring Report
Duke Energy Field Services
Linam Ranch Natural Gas Plant
Lea County, New Mexico

NOVEMBER 20, 2000

Prepared For:

Duke Energy Field Services
P. O. Box 5493
Denver, CO 80217

Prepared By:

TRW

Energy & Environmental Integration Services
415 West Wall, Suite 1818
Midland, Texas 79701

2000 Annual Groundwater Monitoring Report
Duke Energy Field Services
Linam Ranch Gas Plant
Lea County, New Mexico

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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

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SBMITTED BY:

Gilbert J. Van Deventer, REM
Project Manager

DATE: 11/20/00

REVIEWED BY:

Dale T. Littlejohn
Quality Assurance/Control Officer

DATE: 11/26/00

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1.0 Executive Summary

TRW Inc. (TRW) was retained by Duke Energy Field Services (DEFS) to perform the sampling and monitoring operations at the Linam Ranch Plant. This 2000 annual report documents the two semi-annual sampling events performed by TRW at the DEFS Linam Ranch Plant on February 22, 2000 and August 17 - 18, 2000. This report also contains the historical groundwater elevation and analytical data and includes data from all monitoring wells on site. This monitoring and sampling program was conducted in accordance with the revised monitoring plan specified by Mr. Bill Olson of the New Mexico Oil Conservation Division (OCD) in his letter dated March 19, 1999. As such, the monitoring program has been expanded to include the semi-annual sampling of monitoring wells in the vicinity of the former oil/water separator system (liquid waste disposal area).

Based on the sampling and monitoring data to date, the following conclusions relevant to groundwater conditions at the Linam Ranch Plant are evident:

- Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in monitoring wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-10D, MW-11, and MW-12 were below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.

- Benzene levels in MW-9 (0.036 mg/L), MW-10 (3.11 mg/L), and MW-13 (0.04 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- Benzene concentrations in MW-9 (located downgradient from the EOTT tank area) have increased over the last two semi-annual sampling events. The concentrations in all of the other measured hydrocarbon constituents have remained below the laboratory detection levels.

- Dissolved hydrocarbon concentrations in MW-10 (located near the EOTT tank source area) and MW-10D (deeper completed twin to MW-10) have remained stable to decreasing since monitoring began in 1995.

- Dissolved hydrocarbon concentrations in MW-11 (located upgradient from the EOTT tank source area) have also decreased since monitoring began in 1995 and now appear be stabilizing at or below the WQCC standard levels.

- Benzene concentrations in MW-13 (located downgradient from the EOTT tank area) have remained stable (0.04 mg/L to 0.08 mg/L) since the August 1997 sampling event. The concentrations in all of the other measured hydrocarbon constituents have remained at or below the laboratory detection levels.

- It is suspected that the increased levels of dissolved hydrocarbons in MW-13 represents the downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-10 during the April 24, 1996 sampling event. Preliminary estimates, based on the maximum benzene levels observed in each well indicate that the benzene slug is migrating at approximately 0.49 feet per day and attenuating at a rate of approximately one

half-life per 40 feet. At this rate the benzene slug should not represent an environmental threat to potential future receptors within 160 feet southwest of MW-13.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (liquid waste disposal area) and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of October 2, 2000, the product recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 12 gallons of free product (condensate) from monitoring wells MW-4 and MW-6. The measured thickness of product in MW-4 has remained below 0.05 feet during the 2000 monitoring period. The product thickness in MW-6 has historically been less than 0.02 feet, however observations made during three of the last five site visits indicate that the thickness of product is increasing.

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2001.

- Discontinue analyses for aluminum, barium, and silver since these constituents have been below the WQCC standards for over five years.

- Continue free product removal from MW-4 and MW-6 using absorbent socks with monthly inspections.

2.0 Chronology of Events

February 7, 1994	Geoscience Consultants Ltd (GCL) was retained by ENRON Operations Corporation (ENRON) to address groundwater quality conditions at the Hobbs Gas Plant which was scheduled for acquisition by GPM. As part of a subsurface investigation for two areas within the plant, GCL completed temporary drive point wells DP-1 and DP-2 downgradient and upgradient, respectively, of the EOTT tanks, and one monitoring well, MW-8, downgradient of the former liquid waste disposal area. Hydrocarbon-impacted groundwater was identified in DP-1.
May 18-22, 1994	Daniel B. Stevens and Associates (DBS&A) completed seven temporary drive point wells (EOTT-1 through EOTT-7) to delineate the horizontal extent of hydrocarbon-impacted soils and groundwater in the EOTT tank area. Drive point well EOTT-6 was converted into monitoring well MW-9. Hydrocarbon-impacted groundwater was identified east of the EOTT tanks.
October 7, 1994	The OCD requested ENRON to provide a work plan to completely define the extent of groundwater contamination at the Hobbs Gas Plant.
November 1994	GPM acquired ownership and operation of the Linam Ranch Plant (formerly Hobbs Gas Plant) from ENRON.
February 23, 1995	GPM submitted a subsurface investigation work plan to the OCD to address the groundwater conditions at Linam Ranch Plant.
April 5, 1995	The OCD approved the subsurface investigation work plan.
May 10-13, 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 five monitoring wells (MW-10D, MW-10, MW-11, MW-12, and MW-13) and two soils borings (SB-1 and SB-2).
September 18, 1995	GPM submitted the *Subsurface Investigation and Preliminary Remedial Response* report for the Linam Ranch Plant to the OCD.
October 19, 1995	The OCD approved GPM's recommendations for remedial action, which included a quarterly sampling and monitoring program.
November 14, 1995	GCL conducted the fourth quarter 1995 sampling event at Linam Ranch Plant.
January 17, 1996	GCL conducted the first quarter 1996 sampling event at Linam Ranch Plant.
April 24, 1996	GCL conducted the annual (second quarter 1996) sampling event at Linam Ranch Plant. The annual report included recommendations to the OCD for continued monitoring on a semi-annual basis.

January 22, 1997	BDM International, Inc. (formerly GCL) conducted the semi-annual (first quarter 1997) sampling event.
February 5, 1997	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
August 15, 1997	BDM International, Inc. (BDM) conducted the third quarter 1997 (annual) sampling event.
December 11, 1997	GPM submitted the 1997 Annual Groundwater Monitoring and Sampling Report to the OCD.
January 22, 1998	BDM, a wholly owned subsidiary of TRW, conducted the semi-annual (first quarter 1998) sampling event.
March 25, 1998	The OCD approved GPM's recommendations for continued monitoring on a semi-annual basis.
July 22, 1998	TRW conducted the third quarter 1998 (annual) sampling event.
December 4, 1998	GPM submitted the 1998 Annual Groundwater Monitoring and Sampling Report to the OCD.
February 9, 1999	TRW conducted the semi-annual (first quarter 1999) sampling event.
February 10, 1999	GPM submitted a request to revise the monitoring plan to the OCD. The request proposed additional downgradient monitoring in the area of the EOTT tanks (MW-3) in lieu of installing additional wells. The request also proposed expanding the monitoring program to include semi-annual sampling of monitoring wells in the vicinity of the former liquid waste disposal area.
March 19, 1999	The OCD approved GPM's proposed request to revise the monitoring plan.
August 24-25, 1999	TRW conducted the annual (third quarter 1999) sampling event.
October 26, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.
November 22, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.
December 20, 1999	TRW conducted a site visit to empty the passive bailer in MW-4 and check the absorbent sock in MW-6.
January 26, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and replace the absorbent sock in MW-6.

February 22-23, 2000	TRW conducted the semi-annual (first quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and the absorbent sock in MW-6 was removed.
April 4, 2000	TRW conducted a site visit to empty the passive bailer in MW-4 and gauge the product thickness in MW-4 and MW-6.
April 24, 2000	TRW conducted a site visit to empty the passive bailer in MW-4, gauge the product thickness in MW-4 and MW-6, and install a new absorbent sock in MW-6.
June 15, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, check and replace the absorbent sock in MW-6.
July 12, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6, empty the passive bailer in MW-4, check and replace the absorbent sock in MW-6.
August 17-18, 2000	TRW conducted the annual (third quarter 2000) sampling event. Groundwater samples were recovered from MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-9, MW-10, MW-10D, MW-11, MW-12, and MW-13. The passive bailer in MW-4 was emptied and replaced with an absorbent sock. The absorbent sock in MW-6 was checked and replaced.
October 2, 2000	TRW conducted a site visit to gauge the product thickness in MW-4 and MW-6. The absorbent socks in MW-4 and MW-6 were checked and replaced.

3.0 Procedures

During each sampling event, all on-site monitoring wells were gauged for depth to groundwater using a Solinst Model 101 water level indicator with the exception of MW-4 and MW-6 which were gauged using a Heron Model H.01L electronic water/product interface probe. During the both February 2000 and August 2000 sampling events all of the monitoring wells, except MW-4 and MW-6 (due to presence of free product) were sampled. Immediately prior to collecting groundwater samples, a minimum of three well volumes was purged using a decontaminated 2-inch diameter submersible pump, or were purged by hand using a decontaminated PVC bailer. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen (DO) were measured during and after purging using a Hanna Model 9143 DO/temperature meter and a Horiba Model U-10 pH, conductivity, and temperature meter. Groundwater samples were collected after these parameters stabilized. A total of 475 gallons of water was purged from monitoring wells during the two 2000 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 benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. A duplicate sample was collected from MW-13, during the first sampling event, and from MW-9 during the second sampling event. 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. The annual sampling event on August 17 and 18, 1999, included a third and fourth set of water samples that were transferred into appropriately preserved containers for analysis of chlorides and total dissolved solids (TDS) and WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver). Samples for metals analysis were filtered in the field with a 45mm element. A summary of purging and sampling methods is provided on Table 1. 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-1	02/22/00	Bailer	10	Disposable bailer	BTEX and Bio-indicators
	08/17/00	Pump	9	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-2	02/22/00	Bailer	5	Disposable bailer	BTEX and Bio-indicators
	08/17/00	Pump	9	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-3	02/22/00	Pump	15	Disposable bailer	BTEX and Bio-indicators
	08/17/00	Pump	9	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-5	02/23/00	Pump	30	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	20	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-7	02/22/00	Bailer	8	Disposable bailer	BTEX and Bio-indicators
	08/17/00	Bailer	2.5	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-8	02/22/00	Pump	25	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	40	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-9	02/22/00	Pump	15	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	10	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10	02/23/00	Pump	30	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	35	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10D	02/23/00	Bailed	15	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	22	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-11	02/23/00	Pump	30	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-12	02/22/00	Pump	30	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	20	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-13	02/23/00	Pump	30	Disposable bailer	BTEX and Bio-indicators
	08/18/00	Pump	30	Disposable bailer	BTEX, Metals, Ions, Bio-indicators

BTEX - benzene, toluene, ethylbenzene, xylenes
WQCC Metals - Ag, Al, Cr, Fe, and Mn
Major ions - TDS, Cl, NO_3, and SO_4
Bio-indicators - DO, NO3, SO4
Monitoring wells MW-4 and MW-6 not sampled due to presence of free product.

4.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by TRW on August 17, 2000, the groundwater conditions at the Linam Ranch Plant are characterized below.

- The depth to the water table is approximately 49 feet below ground surface in the site area.
- The hydraulic gradient is approximately 0.003 feet/foot.
- The direction of groundwater flow is to the southeast.
- The water table elevation has increased approximately 0.5 feet since August 1999.

The direction of groundwater flow and hydraulic gradient has remained consistent for the past four and a half years, however groundwater elevations, which have steadily decreased from 1995 through January 1999, appear to be generally increasing. Historical groundwater elevations and depth to water measurements are summarized on Table 2, and depicted graphically in Figure 1. Groundwater elevation maps depicting the water table elevation and direction of groundwater flow using the gauging data obtained during the two year 2000 sampling events are presented in Figure 2A (February 21, 2000) and Figure 2B (August 18, 2000).

Table 2
Summary of Groundwater Elevations
Linam Ranch Plant

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	05/22/94	3718.29	3720.18	43.90	3676.28	0.00
	05/17/95	3718.29	3720.18	45.50	3674.68	0.00
	01/17/96	3718.29	3720.18	43.95	3676.23	0.00
	04/24/96	3718.29	3720.18	44.81	3675.37	0.00
	01/22/97	3718.29	3720.18	45.73	3674.45	0.00
	08/15/97	3718.29	3720.18	45.55	3674.63	0.00
	01/22/98	3718.29	3720.18	45.99	3674.19	0.00
	07/20/98	3718.29	3720.18	46.51	3673.67	0.00
	02/09/99	3718.29	3720.18	46.42	3673.76	0.00
	08/24/99	3718.29	3720.18	44.97	3675.21	0.00
	02/21/00	3718.29	3720.18	44.77	3675.41	0.00
	08/17/00	3718.29	3720.18	43.47	3676.71	0.00
MW-2	05/22/94	3714.80	3717.24	34.95	3682.29	0.00
	05/17/95	3714.80	3717.24	43.75	3673.49	0.00
	01/22/97	3714.80	3717.24	44.05	3673.19	0.00
	01/22/98	3714.80	3717.24	44.44	3672.80	0.00
	07/20/98	3714.80	3717.24	44.87	3672.37	0.00
	02/09/99	3714.80	3717.24	44.83	3672.41	0.00
	08/24/99	3714.80	3717.24	42.81	3674.43	0.00
	02/21/00	3714.80	3717.24	44.56	3672.68	0.00
	08/17/00	3714.80	3717.24	37.81	3679.43	0.00
MW-3	05/22/94	3715.50	3717.70	46.23	3671.47	0.00
	05/17/95	3715.50	3717.70	46.98	3670.72	0.00
	11/14/95	3715.50	3717.70	46.40	3671.30	0.00
	04/24/96	3715.50	3717.70	46.57	3671.13	0.00
	01/22/97	3715.50	3717.70	47.23	3670.47	0.00
	01/22/98	3715.50	3717.70	47.74	3669.96	0.00
	07/20/98	3715.50	3717.70	47.90	3669.80	0.00
	02/09/99	3715.50	3717.70	48.11	3669.59	0.00
	08/24/99	3715.50	3717.70	48.02	3669.68	0.00
	02/21/00	3715.50	3717.70	48.19	3669.51	0.00
	08/17/00	3715.50	3717.70	48.02	3669.68	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.003 feet/foot.

Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Plant

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	12/01/92	3720.46	3722.45	45.35	3677.10	0.00
	05/22/94	3720.46	3722.45	45.49	3676.96	0.00
	05/17/95	3720.46	3722.45	47.20	3675.43	0.22
	11/15/95	3720.46	3722.45	46.71	3675.75	0.01
	01/17/96	3720.46	3722.45	46.18	3676.27	0.00
	04/24/96	3720.46	3722.45	46.95	3675.50	0.00
	01/22/97	3720.46	3722.45	48.19	3674.29	0.04
	08/15/97	3720.46	3722.45	48.55	3674.12	0.27
	01/22/98	3720.46	3722.45	49.11	3674.52	1.44
	07/20/98	3720.46	3722.45	48.99	3673.76	0.36
	02/09/99	3720.46	3722.45	48.11	3674.45	0.13
	08/24/99	3720.46	3722.45	47.73	3675.44	0.88
	02/21/00	3720.46	3722.45	46.66	3675.81	0.03
	08/17/00	3720.46	3722.45	46.39	3676.07	< 0.01
MW-5	12/01/92	3721.53	3723.60	45.95	3677.65	0.00
	05/22/94	3721.53	3723.60	46.27	3677.33	0.00
	05/17/95	3721.53	3723.60	48.17	3675.43	0.01
	11/15/95	3721.53	3723.60	46.98	3676.62	0.00
	01/17/96	3721.53	3723.60	47.37	3676.23	0.00
	04/24/96	3721.53	3723.60	48.09	3675.51	0.00
	01/22/97	3721.53	3723.60	49.25	3674.35	0.00
	08/15/97	3721.53	3723.60	49.64	3673.96	0.00
	01/22/98	3721.53	3723.60	48.86	3674.74	0.00
	07/20/98	3721.53	3723.60	49.39	3674.21	0.00
	02/09/99	3721.53	3723.60	48.76	3674.84	0.00
	08/24/99	3721.53	3723.60	48.13	3675.47	0.00
	02/21/00	3721.53	3723.60	47.76	3675.84	0.00
	08/17/00	3721.53	3723.60	47.94	3675.66	0.00
MW-6	12/01/92	3720.99	3723.08	46.21	3676.87	0.00
	05/22/94	3720.99	3723.08	46.38	3676.70	0.00
	05/17/95	3720.99	3723.08	48.25	3674.87	0.05
	11/15/95	3720.99	3723.08	46.29	3676.80	0.01
	01/17/96	3720.99	3723.08	46.90	3676.18	0.00
	04/24/96	3720.99	3723.08	46.72	3676.37	0.01
	01/22/97	3720.99	3723.08	48.89	3674.21	0.02
	08/15/97	3720.99	3723.08	49.21	3673.91	0.05
	01/22/98	3720.99	3723.08	48.91	3674.21	0.05
	07/20/98	3720.99	3723.08	49.56	3673.59	0.08
	02/09/99	3720.99	3723.08	49.24	3673.84	0.00
	08/24/99	3720.99	3723.08	48.22	3674.86	0.00
	02/21/00	3720.99	3723.08	47.97	3675.11	0.00
	08/17/00	3720.99	3723.08	47.48	3675.61	< 0.01

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.003 feet/foot.

Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Plant

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-7	05/22/94	3728.57	3730.84	54.52	3676.32	0.00
	05/17/95	3728.57	3730.84	57.00	3673.84	0.00
	11/14/95	3728.57	3730.84	57.95	3672.89	0.00
	04/24/96	3728.57	3730.84	58.00	3672.84	0.00
	01/22/97	3728.57	3730.84	57.71	3673.13	0.00
	01/22/98	3728.57	3730.84	57.57	3673.27	0.00
	02/09/99	3728.57	3730.84	57.29	3673.55	0.00
	08/24/99	3728.57	3730.84	57.64	3673.20	0.00
	02/21/00	3728.57	3730.84	57.39	3673.45	0.00
	08/17/00	3728.57	3730.84	57.26	3673.58	0.00
MW-8	05/22/94	3714.18	3716.18	41.35	3674.83	0.00
	05/17/95	3714.18	3716.18	43.45	3672.73	0.00
	01/17/96	3714.18	3716.18	41.71	3674.47	0.00
	04/24/96	3714.18	3716.18	42.82	3673.36	0.00
	01/22/97	3714.18	3716.18	43.40	3672.78	0.00
	08/15/97	3714.18	3716.18	44.14	3672.04	0.00
	01/22/98	3714.18	3716.18	44.31	3671.87	0.00
	07/20/98	3714.18	3716.18	44.57	3671.61	0.00
	02/09/99	3714.18	3716.18	44.70	3671.48	0.00
	08/24/99	3714.18	3716.18	43.62	3672.56	0.00
	02/21/00	3714.18	3716.18	44.25	3671.93	0.00
	08/17/00	3714.18	3716.18	41.52	3674.66	0.00
MW-9	05/22/94	3720.48	3722.48	49.59	3672.89	0.00
	05/17/95	3720.48	3722.48	50.60	3671.88	0.00
	11/14/95	3720.48	3722.48	50.02	3672.46	0.00
	01/17/96	3720.48	3722.48	49.84	3672.64	0.00
	04/24/96	3720.48	3722.48	50.08	3672.40	0.00
	02/07/97	3720.48	3722.48	50.96	3671.52	0.00
	08/15/97	3720.48	3722.48	51.34	3671.14	0.00
	01/22/98	3720.48	3722.48	51.48	3671.00	0.00
	07/20/98	3720.48	3722.48	51.58	3670.90	0.00
	02/09/99	3720.48	3722.48	51.81	3670.67	0.00
	08/24/99	3720.48	3722.48	51.59	3670.89	0.00
	02/21/00	3720.48	3722.48	51.70	3670.78	0.00
	08/17/00	3720.48	3722.48	51.56	3670.92	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.003 feet/foot.

Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Plant

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-10	05/17/95	3720.76	3722.90	50.45	3672.45	0.00
	11/14/95	3720.76	3722.90	49.85	3673.05	0.00
	01/17/96	3720.76	3722.90	49.82	3673.08	0.00
	04/24/96	3720.76	3722.90	50.15	3672.75	0.00
	02/07/97	3720.76	3722.90	51.12	3671.78	0.00
	08/15/97	3720.76	3722.90	51.49	3671.41	0.00
	01/22/98	3720.76	3722.90	51.57	3671.33	0.00
	07/20/98	3720.76	3722.90	51.68	3671.22	0.00
	02/09/99	3720.76	3722.90	51.88	3671.02	0.00
	08/24/99	3720.76	3722.90	51.51	3671.39	0.00
	02/21/00	3720.76	3722.90	51.66	3671.24	0.00
	08/17/00	3720.76	3722.90	51.37	3671.53	0.00
MW-10D	05/17/95	3720.85	3723.54	51.38	3672.16	0.00
	11/14/95	3720.85	3723.54	50.63	3672.91	0.00
	01/17/96	3720.85	3723.54	50.73	3672.81	0.00
	04/24/96	3720.85	3723.54	51.18	3672.36	0.00
	02/07/97	3720.85	3723.54	52.11	3671.43	0.00
	08/15/97	3720.85	3723.54	52.47	3671.07	0.00
	01/22/98	3720.85	3723.54	52.41	3671.13	0.00
	07/20/98	3720.85	3723.54	52.55	3670.99	0.00
	02/09/99	3720.85	3723.54	52.76	3670.78	0.00
	08/24/99	3720.85	3723.54	52.51	3671.03	0.00
	02/21/00	3720.85	3723.54	52.56	3670.98	0.00
	08/17/00	3720.85	3723.54	52.25	3671.29	0.00
MW-11	05/17/95	3722.02	3724.53	51.50	3673.03	0.00
	11/14/95	3722.02	3724.53	50.34	3674.19	0.00
	01/17/96	3722.02	3724.53	50.65	3673.88	0.00
	04/24/96	3722.02	3724.53	51.22	3673.31	0.00
	02/07/97	3722.02	3724.53	52.32	3672.21	0.00
	08/15/97	3722.02	3724.53	52.72	3671.81	0.00
	01/22/98	3722.02	3724.53	52.52	3672.01	0.00
	07/20/98	3722.02	3724.53	52.65	3671.88	0.00
	02/09/99	3722.02	3724.53	52.85	3671.68	0.00
	08/24/99	3722.02	3724.53	52.47	3672.06	0.00
	02/21/00	3722.02	3724.53	52.44	3672.09	0.00
	08/17/00	3722.02	3724.53	52.06	3672.47	0.00

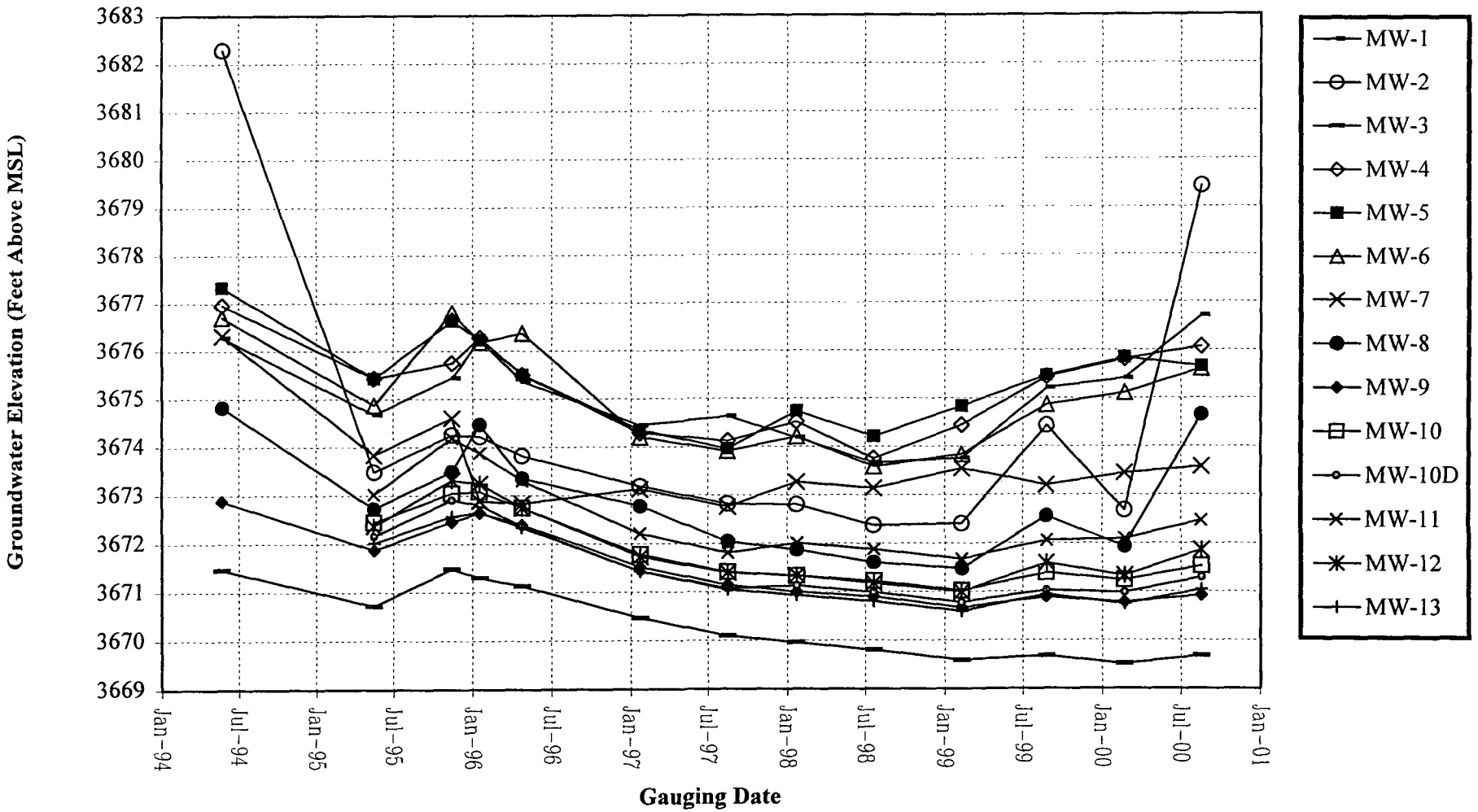
* Elevations surveyed by John W. West Engineering Company of Hobbs, NM.
The monitoring well casings were marked on the north side to provide consistent reference points for future gauging operations.
Groundwater direction is to the southeast with a hydraulic gradient of approximately 0.003 feet/foot.

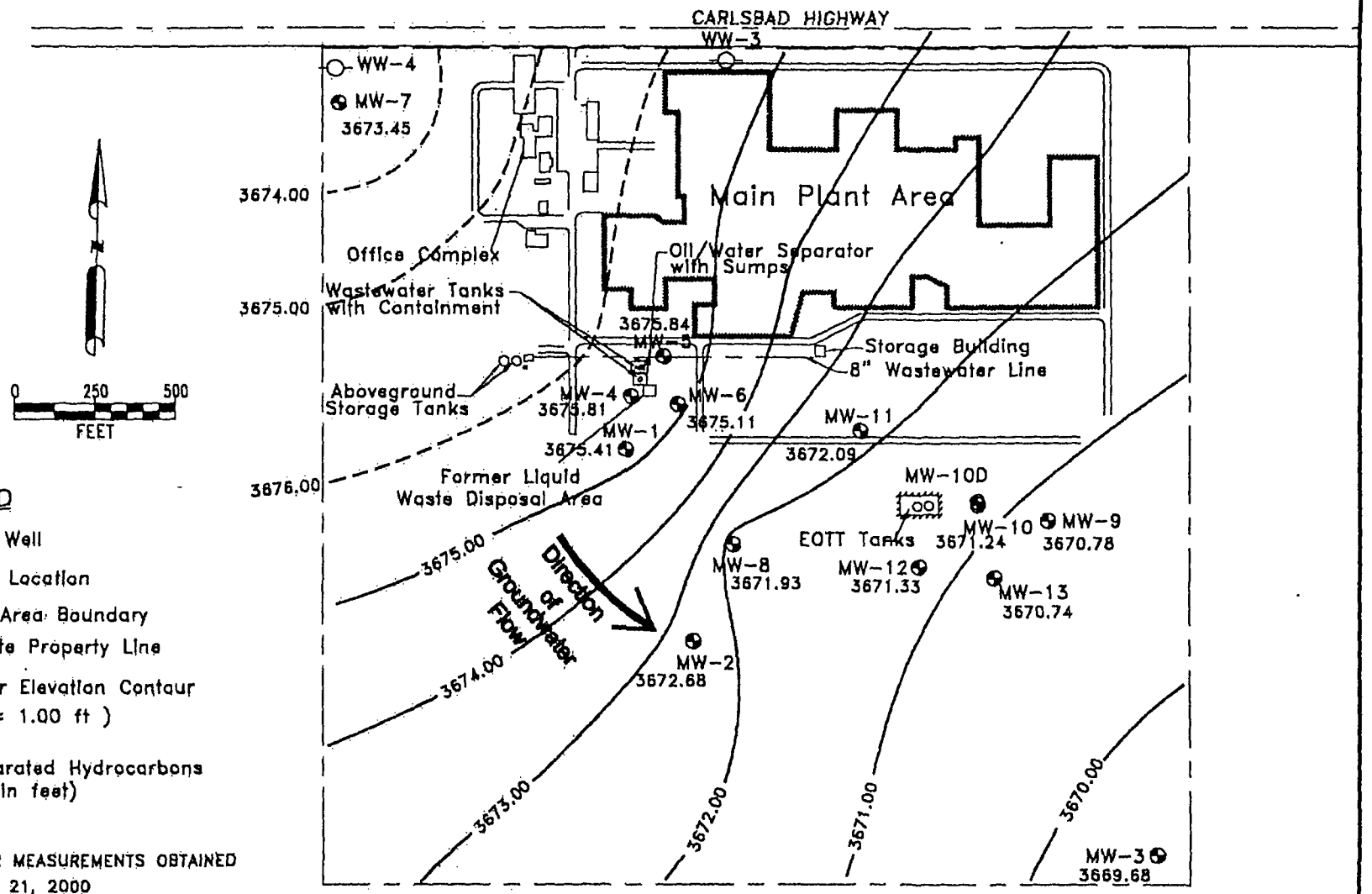
Table 2 (Continued)
Summary of Groundwater Elevations
Linam Ranch Plant

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-12	05/17/95	3720.60	3722.84	50.47	3672.37	0.00
	11/14/95	3720.60	3722.84	49.52	3673.32	0.00
	01/17/96	3720.60	3722.84	49.59	3673.25	0.00
	04/24/96	3720.60	3722.84	50.09	3672.75	0.00
	02/07/97	3720.60	3722.84	51.10	3671.74	0.00
	08/15/97	3720.60	3722.84	51.44	3671.40	0.00
	01/22/98	3720.60	3722.84	51.50	3671.34	0.00
	07/20/98	3720.60	3722.84	51.66	3671.18	0.00
	02/09/99	3720.60	3722.84	51.84	3671.00	0.00
	08/24/99	3720.60	3722.84	51.25	3671.59	0.00
	02/21/00	3720.60	3722.84	51.51	3671.33	0.00
	08/17/00	3720.60	3722.84	50.98	3671.86	0.00
MW-13	05/17/95	3721.63	3723.99	51.97	3672.02	0.00
	11/14/95	3721.63	3723.99	51.42	3672.57	0.00
	01/17/96	3721.63	3723.99	51.33	3672.66	0.00
	04/24/96	3721.63	3723.99	51.65	3672.34	0.00
	02/07/97	3721.63	3723.99	52.56	3671.43	0.00
	08/15/97	3721.63	3723.99	52.94	3671.05	0.00
	01/22/98	3721.63	3723.99	53.06	3670.93	0.00
	07/20/98	3721.63	3723.99	53.19	3670.80	0.00
	02/09/99	3721.63	3723.99	53.39	3670.60	0.00
	08/24/99	3721.63	3723.99	53.05	3670.94	0.00
	02/21/00	3721.63	3723.99	53.25	3670.74	0.00
	08/17/00	3721.63	3723.99	52.95	3671.04	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.003 feet/foot.

FIGURE 1
Groundwater Elevation Versus Time

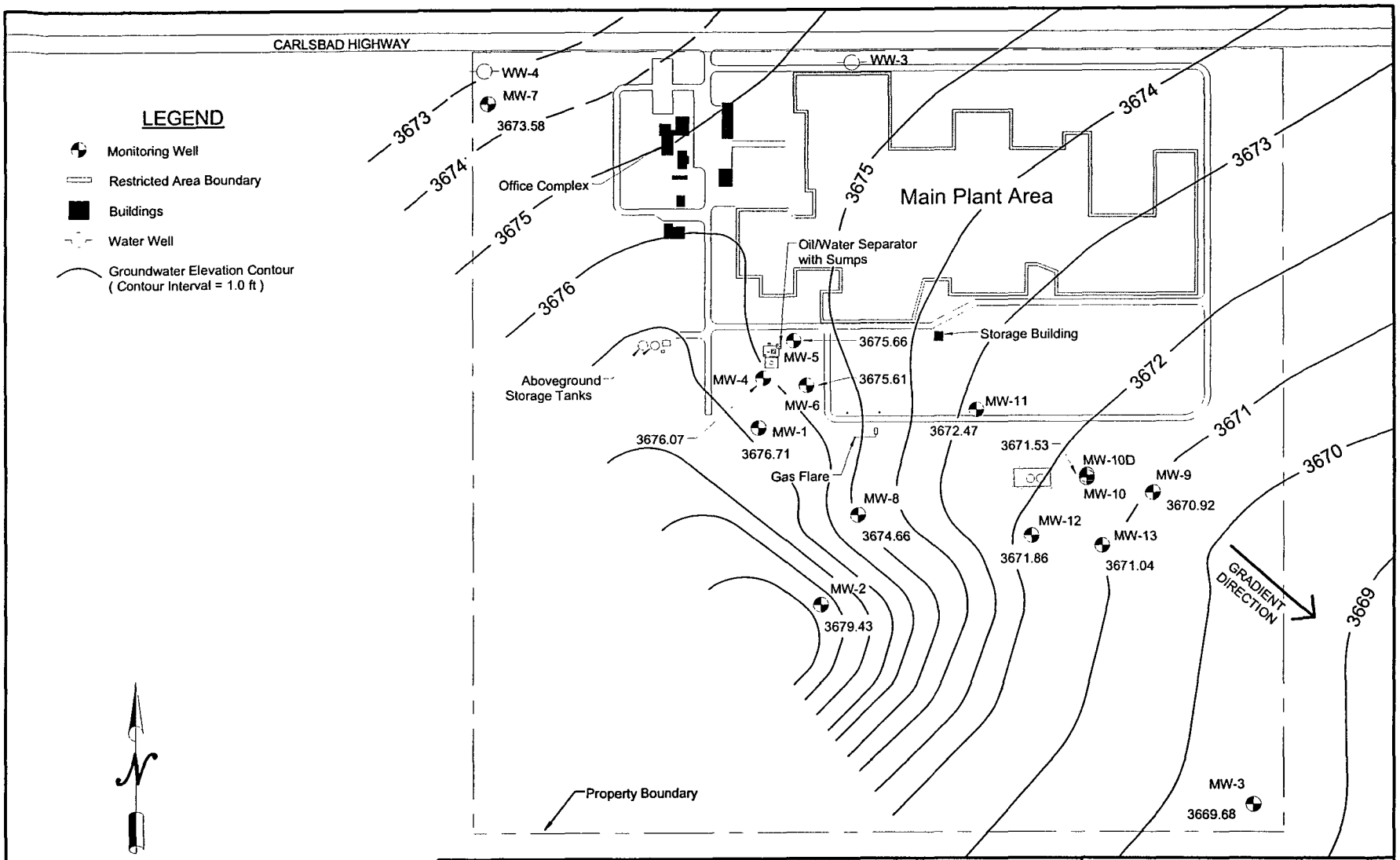




TRW

CLIENT: GPM-Linam Ranch Plant		FIGURE 1A LINAM RANCH PLANT GROUNDWATER ELEVATION MAP
DATE: 02/21/00	FILE NAME: Grwelev0200.dwg	
AUTHOR: GJV	DRN BY: D. Lopez	
CK'D BY: DTL	SCALE: 1 in. = 500 ft.	

D:\DWG\TRW\LINAM\Grwelev0200.dwg



TRW

CLIENT: DEFS - Linam Ranch Plant	
DATE: 08/17/00	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: MP
CK'D BY: GJV	SCALE: 1"=500'

Figure 2B

LINAM RANCH PLANT
GROUNDWATER ELEVATION
GAUGING DATE: 8/17/00

5.0 Groundwater Quality Conditions

5.1 Distribution of Hydrocarbons in Groundwater

A historical listing of benzene, toluene, ethylbenzene and xylene (BTEX) concentrations obtained from the on site monitoring wells is summarized in Table 3. Figures 3 (A through F) graphically depicts the BTEX concentrations in groundwater and the groundwater elevations versus time (monitoring period) for monitoring wells MW-5, MW-9, MW-10, MW-10D, MW-11, and MW-13, respectively. Hydrocarbon concentration maps depicting the BTEX concentrations for the two 2000 sampling events are presented in Figure 4A (February 22, 2000) and Figure 4B (August 18, 2000).

Based on the analytical results, the distribution of hydrocarbons at the Linam Ranch Plant is described below.

- BTEX concentrations in monitoring wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-10D, MW-11, and MW-12 were below the New Mexico WQCC standards for each constituent.

- Benzene levels in MW-9 (0.036 mg/L), MW-10 (3.11 mg/L), and MW-13 (0.04 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- Benzene concentrations in MW-9 (located downgradient from the EOTT tank area) have increased over the last two semi-annual sampling events. The concentrations in all of the other measured hydrocarbon constituents have remained below the laboratory detection levels.

- Dissolved hydrocarbon concentrations in MW-10 (located near the EOTT tank source area) and MW-10D (deeper completed twin to MW-10) have remained stable to decreasing since monitoring began in 1995.

- Dissolved hydrocarbon concentrations in MW-11 (located upgradient from the EOTT tank source area) have also decreased since monitoring began in 1995 and now appear be stabilizing at or below the WQCC standard levels.

- Benzene concentrations in MW-13 (located downgradient from the EOTT tank area) have remained stable (0.04 mg/L to 0.08 mg/L) since the August 1997 sampling event. The concentrations in all of the other measured hydrocarbon constituents have remained at or below the laboratory detection levels.

- It is suspected that the increased levels of dissolved hydrocarbons in MW-13 represents the downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-10 during the April 24, 1996 sampling event. Preliminary estimates, based on the maximum benzene levels observed in each well indicate that the benzene slug is migrating at approximately 0.49 feet per day and attenuating at a rate of approximately one

half-life per 40 feet. At this rate the benzene slug should not represent an environmental threat to potential future receptors within 160 feet southwest of MW-13.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

Table 3
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-1	09/20/91	0.0053	0.0067	0.001	<0.001
	11/03/92	0.0015	0.0015	<0.001	0.010
	12/02/92	0.0013	0.0014	<0.001	0.006
	01/12/94	0.0039	<0.001	0.0021	0.002
	05/17/95	<0.002	<0.002	<0.002	<0.002
	08/25/99	<0.005	<0.005	<0.005	0.006
	02/22/00	<0.005	<0.005	<0.005	0.006
	08/18/00	<0.001	<0.001	<0.001	0.011
MW-2	09/20/91	<0.001	<0.001	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	<0.001	<0.001	<0.001	<0.001
MW-3	09/20/91	<0.001	0.0021	<0.001	<0.001
	05/17/95	<0.001	<0.001	<0.001	<0.001
	02/09/99	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/17/00	<0.005	<0.005	<0.005	<0.005
MW-4	11/03/92	**16.0**	**8.0**	0.7	**1.8**
	12/02/92	**17.0**	**8.2**	0.53	**1.3**
	01/10/94	**18.0**	**10.0**	0.5	**1.3**
	05/17/95	**20.9**	**1.35**	<0.2	**11.4**
MW-5	11/03/92	0.003	0.0034	0.003	0.034
	12/02/92	0.0091	0.0041	0.0082	0.037
	01/10/94	**0.300**	0.190	0.160	0.490
	05/17/95	**0.090**	0.014	0.138	**0.831**
	08/25/99	**0.137**	0.037	0.262	0.179
	02/23/00	**0.068**	<0.005	0.13	0.09
	08/18/00	<0.005	<0.005	0.006	0.008
MW-6	11/03/92	**0.340**	0.023	0.051	0.120
	12/02/92	**0.520**	0.020	0.058	0.120
	01/10/94	**0.770**	0.0029	0.096	0.210
	05/17/95	**0.980**	0.007	0.087	0.181
MW-7	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/17/00	<0.005	<0.005	<0.005	<0.005
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 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 3 (Continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-8	02/09/94	<0.001	<0.005	<0.005	<0.005
	05/17/95	<0.001	<0.001	<0.001	<0.001
	08/24/99	<0.001	<0.001	<0.001	<0.001
	02/22/00	<0.005	<0.005	<0.005	<0.005
	08/18/00	0.002	<0.001	<0.001	<0.001
MW-9	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	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
	08/15/97	<0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/20/98	<0.001	<0.001	<0.001	<0.001
	02/09/99	**0.011**	<0.001	<0.001	<0.001
	08/24/99	<0.005	<0.005	<0.005	<0.005
	02/22/00	**0.014**	<0.005	<0.005	<0.005
	08/18/00	**0.036**	<0.005	<0.005	<0.005
MW-10	05/17/95	**3.225**	0.052	0.049	0.169
	11/14/95	**5.230**	0.001	<0.001	0.406
	01/17/96	**6.110**	**0.863**	**1.140**	**1.050**
	04/24/96	**6.940**	<0.010	**1.190**	0.127
	01/22/97	**6.41**	**1.63**	0.294	**8.97**
	08/15/97	**5.63**	**1.35**	0.479	**0.453**
	01/22/98	**7.03**	**1.93**	**0.802**	**0.635**
	07/22/98	**7.18**	**2.34**	**0.777**	0.606
	02/09/99	**4.87**	0.32	0.516	0.372
	08/25/99	**5.58**	0.658	0.557	0.359
	02/23/00	**2.35**	0.129	0.164	0.124
	08/18/00	**3.11**	0.025	0.072	0.038
MW-10D	05/17/95	**0.096**	0.004	<0.001	0.008
	11/14/95	**0.125**	0.001	<0.001	0.011
	01/17/96	**0.841**	0.001	<0.001	0.047
	04/24/96	**8.140**	0.046	**1.170**	0.076
	01/22/97	**0.365**	<0.005	<0.005	<0.005
	08/15/97	**0.221**	<0.01	<0.01	<0.01
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	**0.184**	0.014	0.008	0.006
	02/09/99	0.009	<0.005	<0.005	<0.005
	08/25/99	**0.036**	<0.001	0.001	0.002
	02/23/00	**0.014**	<0.005	<0.005	<0.005
	08/18/00	<0.005	<0.005	<0.005	<0.005
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 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 3 (Continued)
Summary of Dissolved BTEX Concentrations
Linam Ranch Plant

Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-11	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	**0.306**	<0.001	<0.001	0.013
	01/17/96	**0.549**	0.004	0.002	0.031
	04/24/96	**0.520**	<0.002	<0.002	<0.002
	01/22/97	**0.267**	<0.001	<0.001	0.017
	08/15/97	**0.164**	<0.001	0.002	0.007
	01/22/98	**0.291**	0.004	<0.001	0.015
	07/22/98	**0.061**	<0.001	<0.001	0.010
	02/09/99	**0.018**	<0.001	<0.001	<0.001
	08/24/99	0.005	<0.001	<0.001	<0.001
	02/23/00	**0.02**	<0.001	0.002	0.008
	08/18/00	0.009	<0.005	<0.005	<0.005
MW-12	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	<0.001	<0.001	<0.001	<0.001
	01/17/96	<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
	08/15/97	0.001	<0.001	<0.001	<0.001
	01/22/98	<0.001	<0.001	<0.001	<0.001
	07/22/98	0.002	<0.001	<0.001	<0.001
	02/09/99	0.001	<0.001	<0.001	<0.001
	08/24/99	0.003	<0.001	<0.001	<0.001
	02/22/00	<0.001	<0.001	<0.001	<0.001
	08/18/00	<0.005	<0.005	<0.005	<0.005
MW-13	05/17/95	<0.001	<0.001	<0.001	<0.001
	11/14/95	0.003	<0.001	0.001	<0.001
	01/17/96	<0.001	<0.001	<0.001	<0.001
	04/24/96	<0.001	<0.001	<0.001	<0.001
	01/22/97	**0.048**	<0.001	<0.001	<0.001
	08/15/97	**0.132**	<0.001	<0.001	0.01
	01/22/98	**0.082**	<0.001	<0.001	<0.001
	07/20/98	**0.061**	<0.001	<0.001	<0.001
	02/09/99	**0.082**	<0.001	<0.001	<0.001
	08/24/99	**0.062**	<0.001	<0.001	<0.001
	02/23/00	**0.08**	<0.001	<0.001	<0.001
	08/18/00	**0.04**	<0.005	<0.005	<0.005
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 17, 1995 (EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

FIGURE 3A

BTEX Concentration and Groundwater Elevation Versus Time (MW-5)

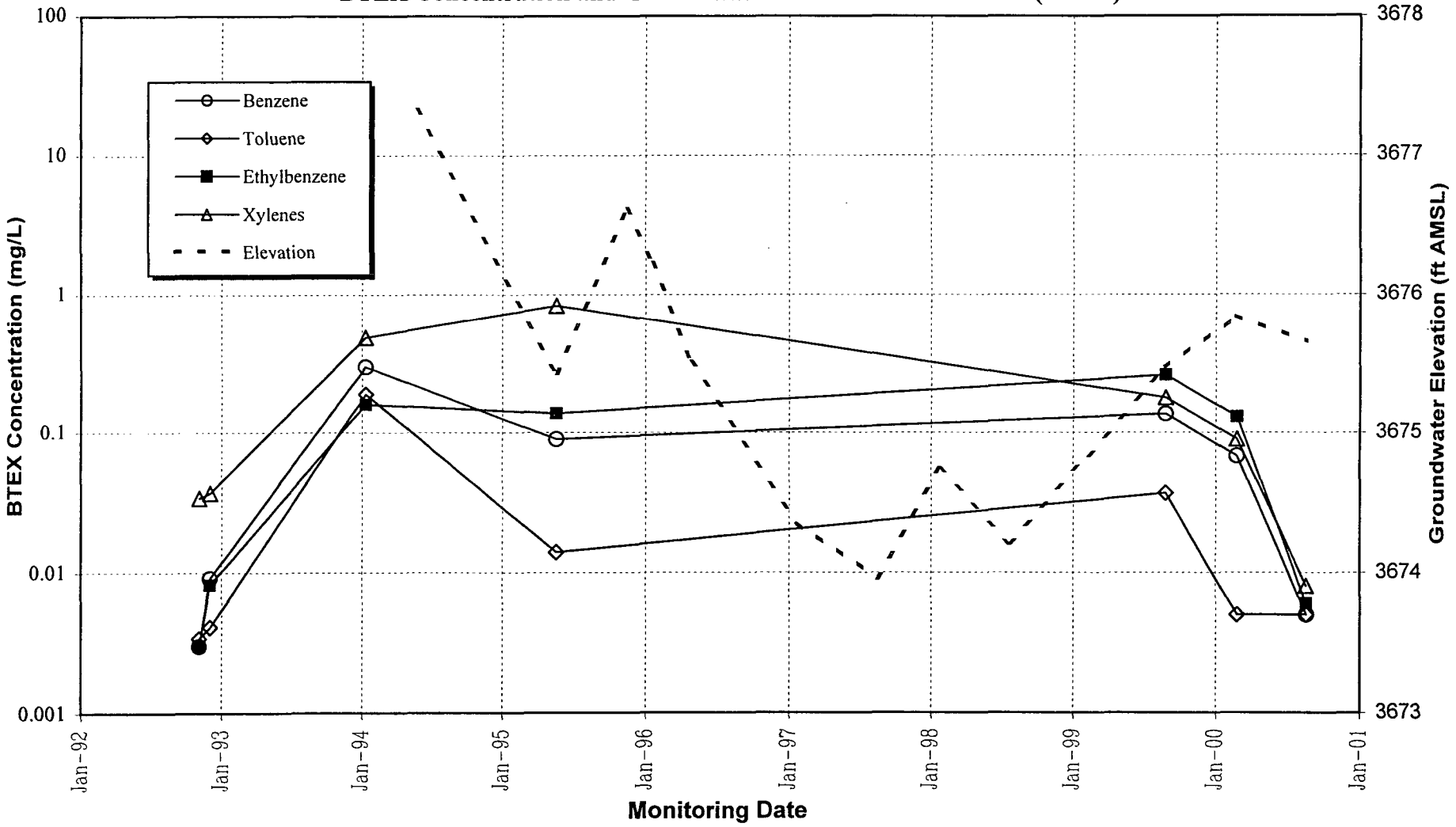


FIGURE 3B
BTEX Concentration and Groundwater Elevation Versus Time (MW-9)

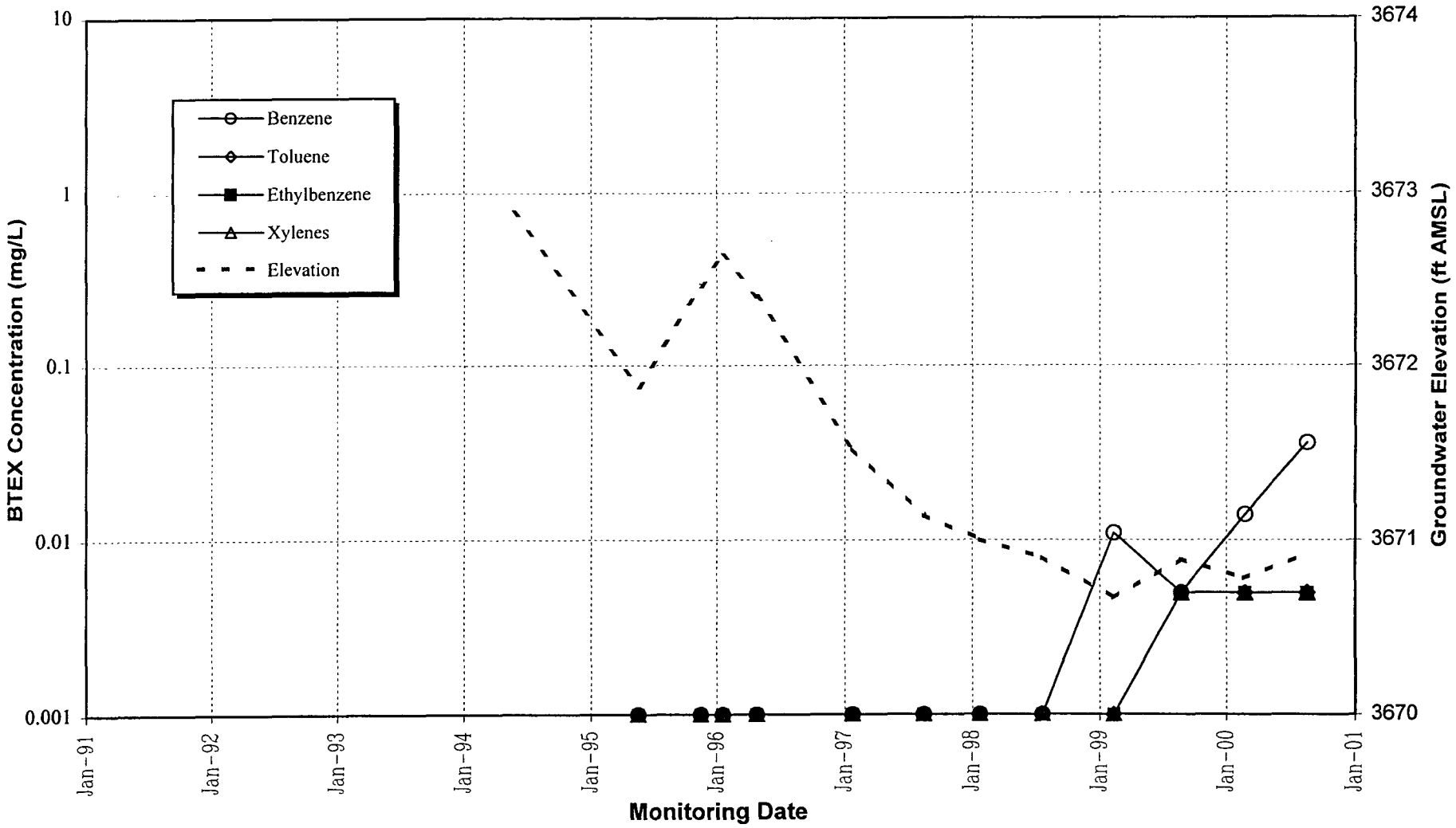


FIGURE 3C

BTEX Concentration and Groundwater Elevation Versus Time (MW-10)

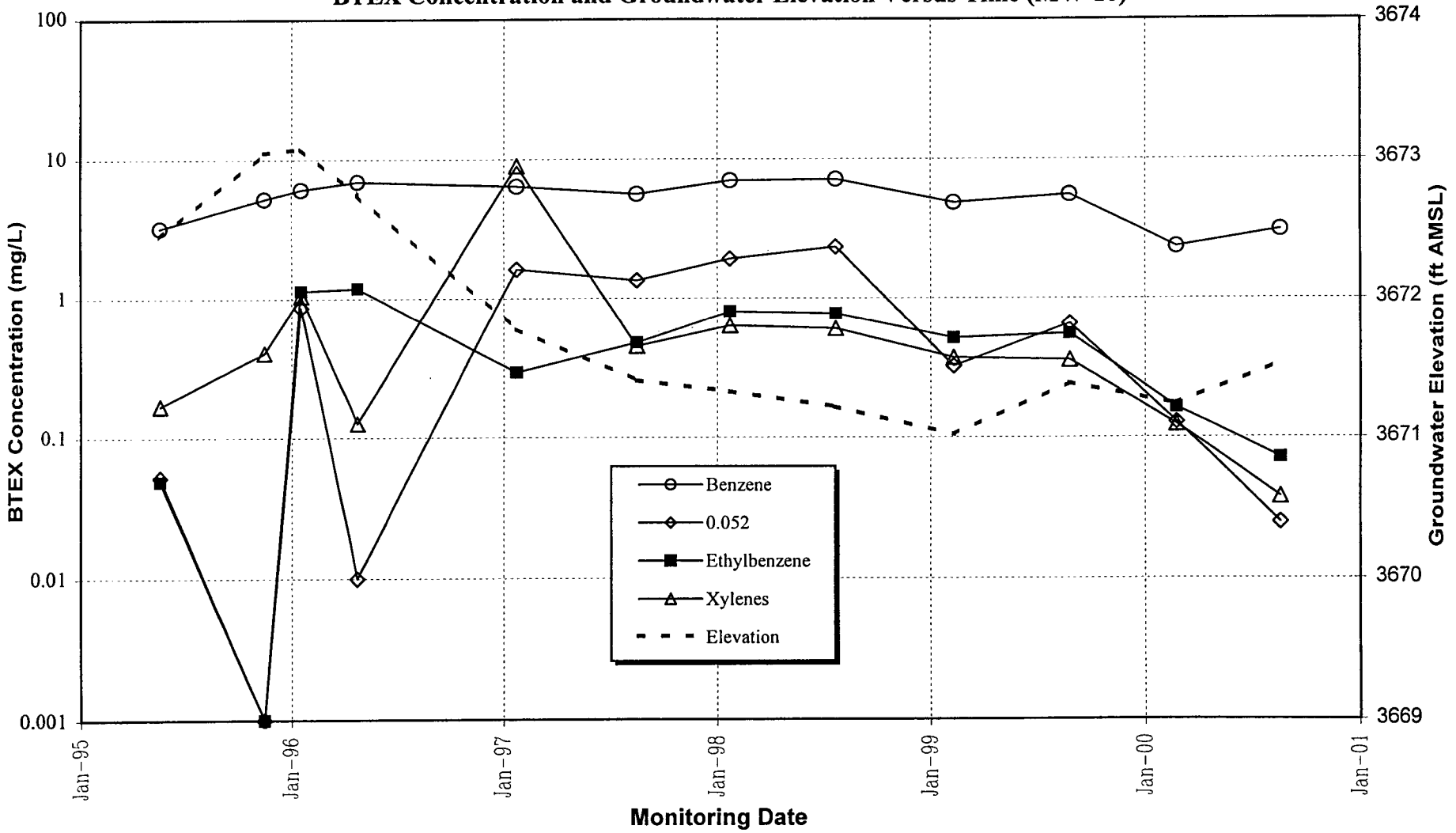


FIGURE 3D

BTEX Concentration and Groundwater Elevation Versus Time (MW-10D)

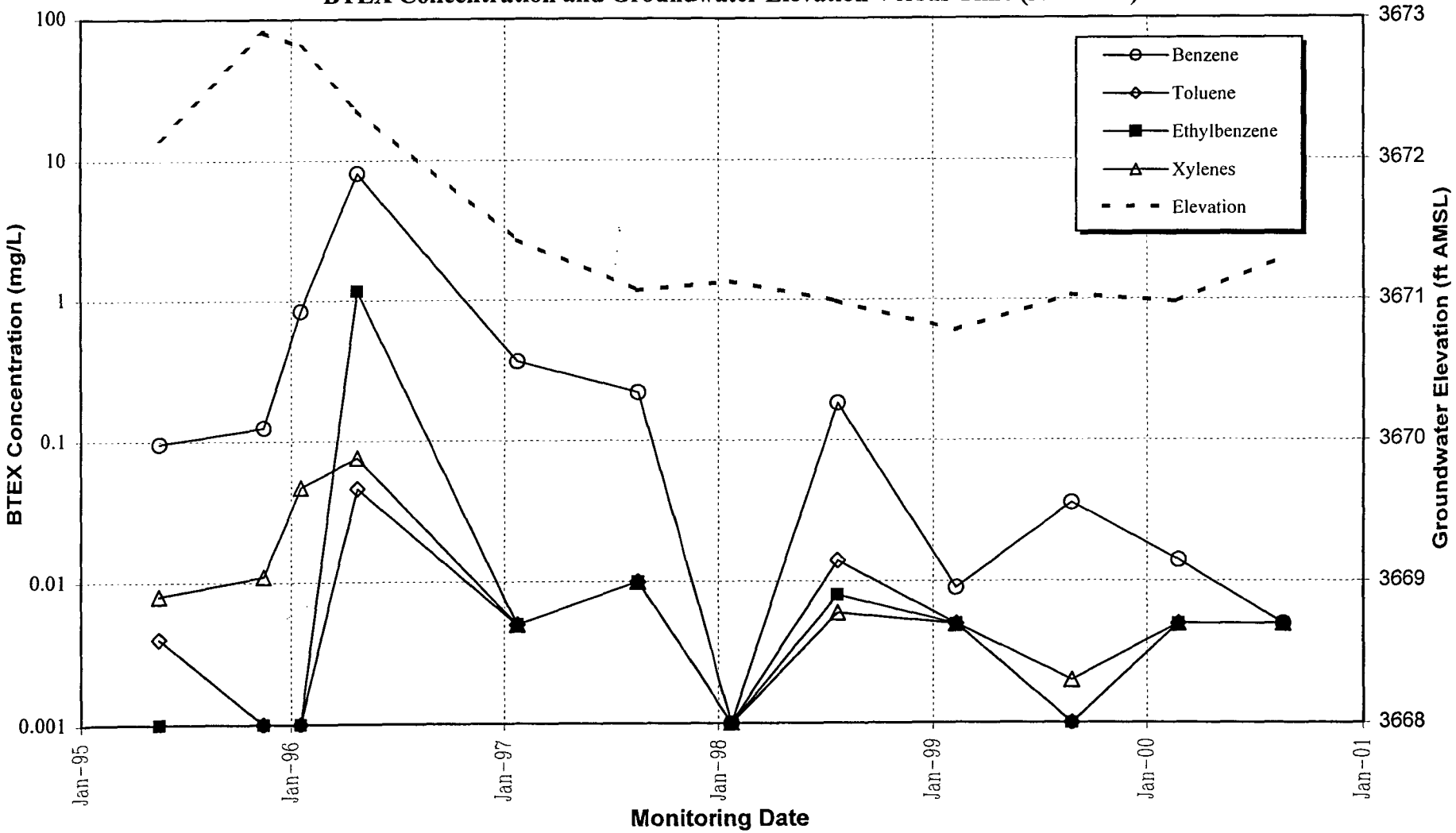


FIGURE 3E
BTEX Concentration and Groundwater Elevation Versus Time (MW-11)

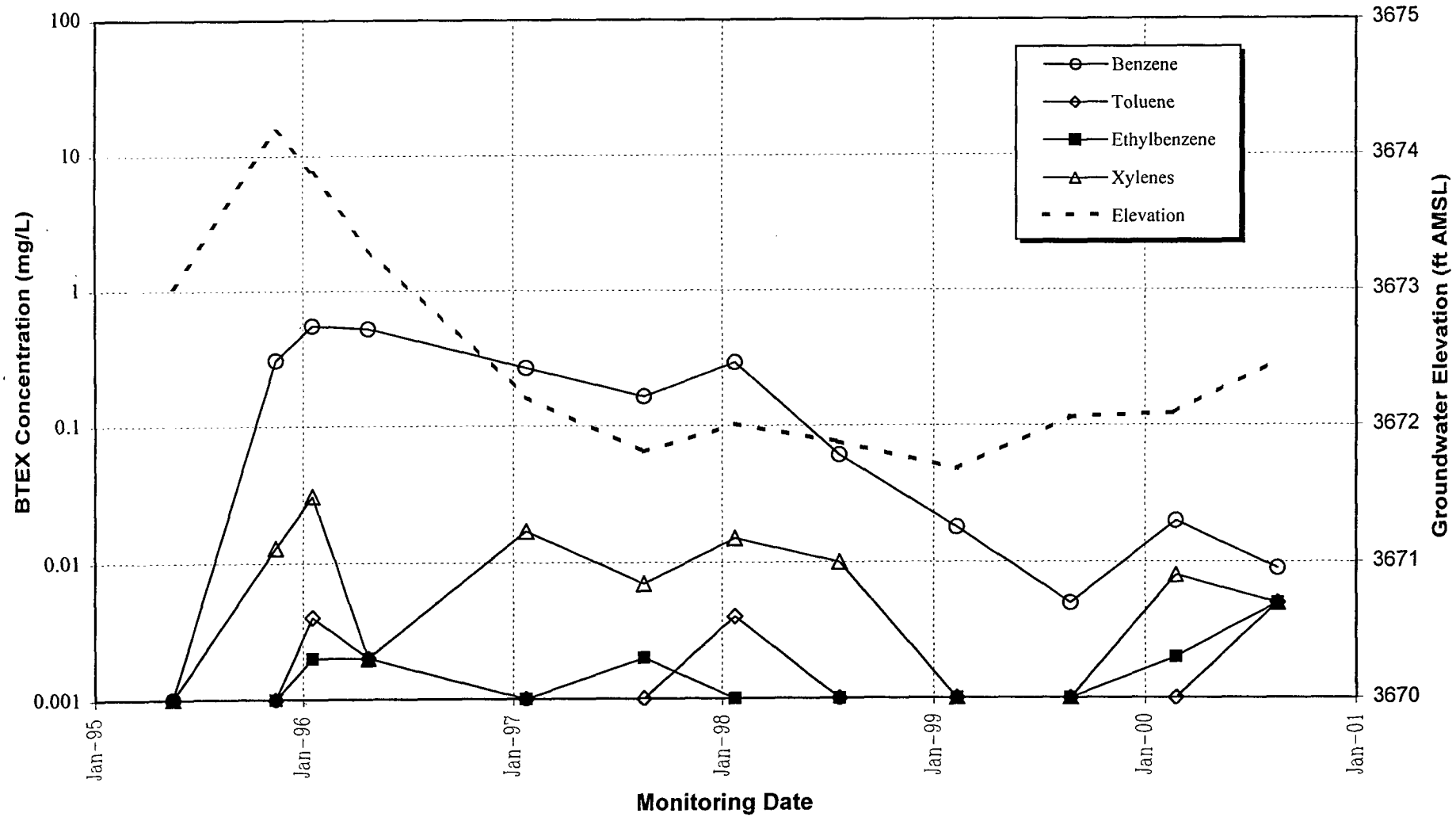
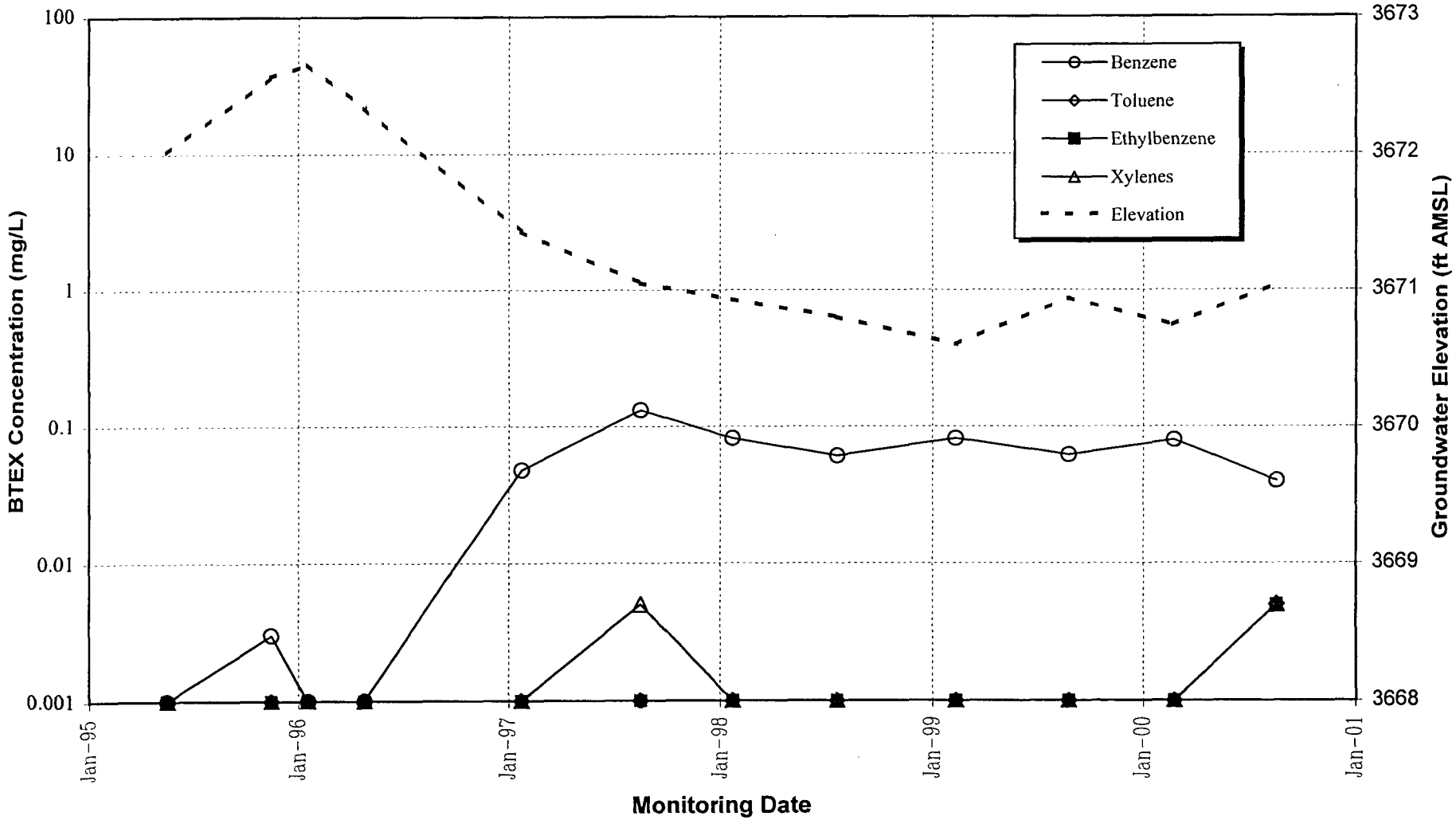
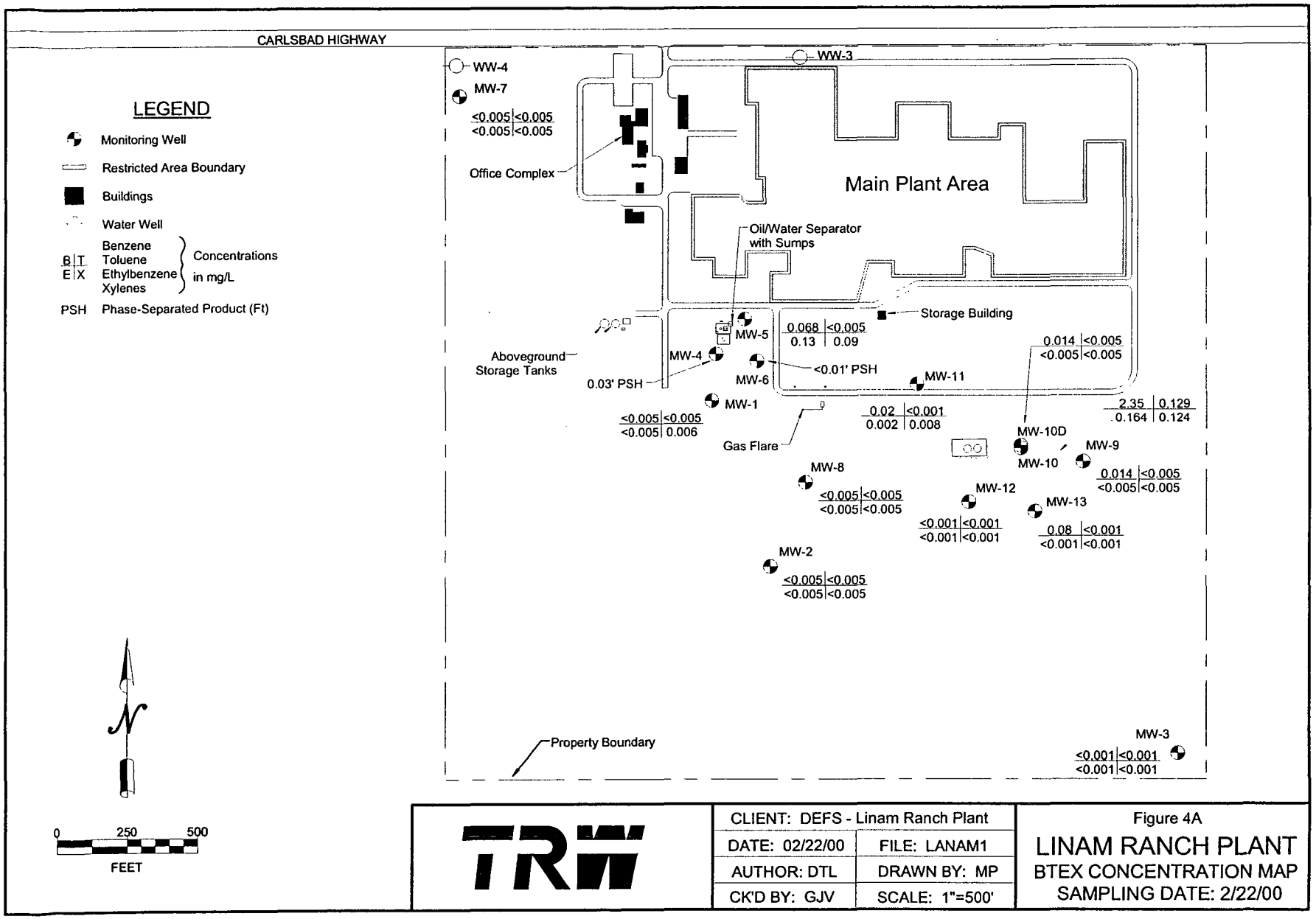


FIGURE 3F
BTEX Concentration and Groundwater Elevation Versus Time (MW-13)





TRW

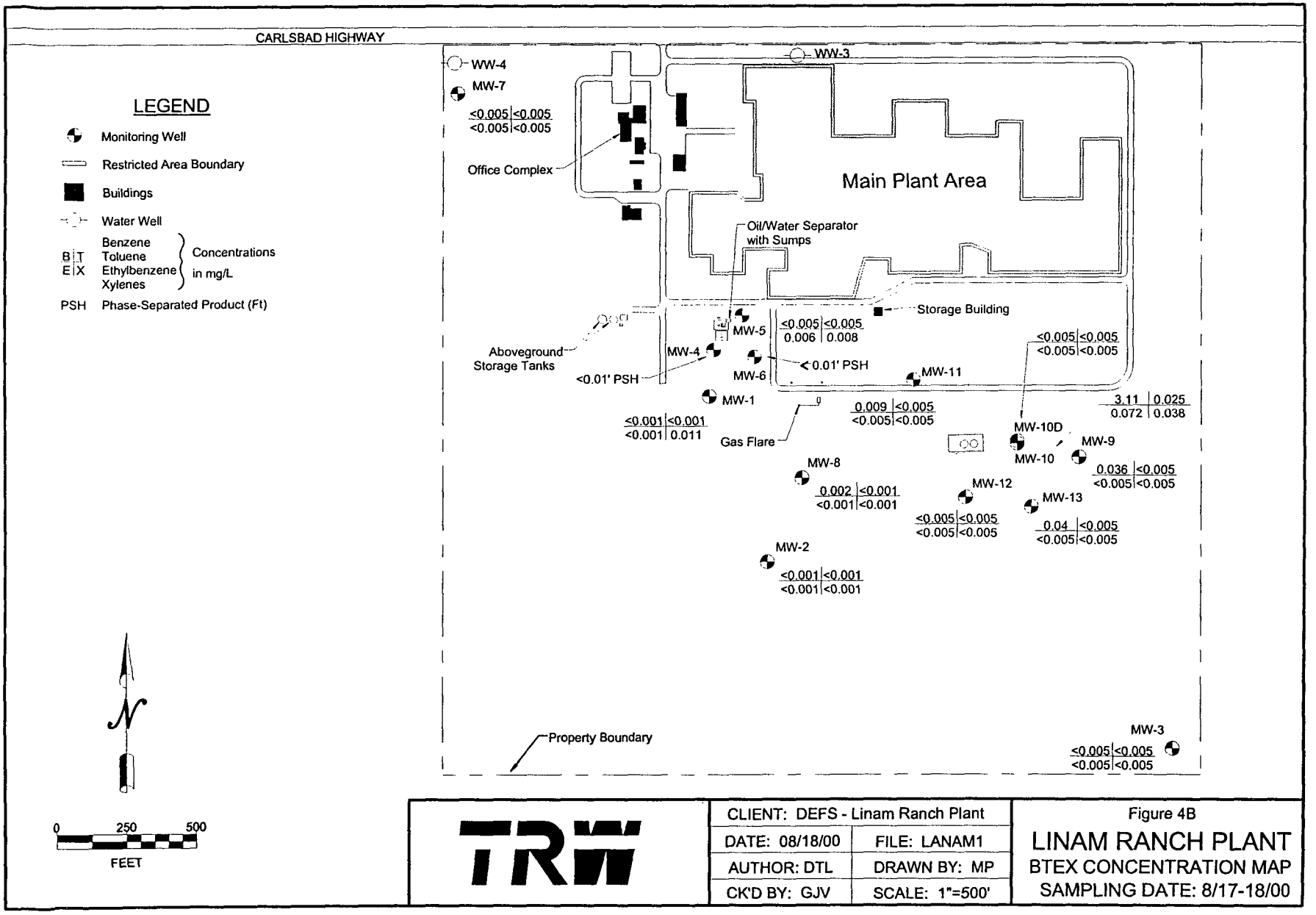
CLIENT: DEFS - Linam Ranch Plant	
DATE: 02/22/00	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: MP
CK'D BY: GJV	SCALE: 1"=500'

Figure 4A

LINAM RANCH PLANT

BTEX CONCENTRATION MAP

SAMPLING DATE: 2/22/00



TRW

CLIENT: DEFS - Linam Ranch Plant	
DATE: 08/18/00	FILE: LANAM1
AUTHOR: DTL	DRAWN BY: MP
CK'D BY: GJV	SCALE: 1"=500'

Figure 4B

LINAM RANCH PLANT

BTEX CONCENTRATION MAP

SAMPLING DATE: 8/17-18/00

5.2 Distribution of WQCC Metals and Ions in Groundwater

Historical groundwater sample analytical results for WQCC metals (aluminum, arsenic, barium, cadmium, chromium, iron, manganese, and silver) and selected ions (chloride, nitrate, sulfate, and TDS) are presented in Table 4. The WQCC standards are also listed in the table 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 metal analytical results for the 2000 annual sampling event indicate no constituents exceeded the WQCC standards with the exceptions of manganese in MW-5 (0.77 mg/L), MW-10 (0.58 mg/L), and MW-10D (0.38 mg/L). The elevated levels of manganese appear to 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 resulting in higher concentrations. Based on the results of the metal analyses during the annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals.

Analyses of chlorides and total dissolved solids (TDS) during the annual 2000 sampling event indicate no constituents exceeded the WQCC standards with the exception of TDS in monitoring wells MW-1 (2,700 mg/L), MW-5 (1,600 mg/L), and MW-10 (1,100 mg/L). The minor exceedance of the TDS concentrations over the WQCC standards of 1,000 mg/L does not represent a significant risk to human health.

Table 4
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-1	05/17/95	<0.01	**62.67**	**0.2**	0.8	**0.02**	**0.46**	**30.76**	**0.56**	188	**2,204**
	08/24/99	<0.01	<0.2	0.08	<0.05	<0.01	0.01	<0.05	**0.22**	110	**2,400**
	08/18/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	160	**2,700**
MW-2	05/17/95	**0.77**	0.16	<0.1	0.41	<0.01	0.02	0.34	**0.41**	6	378
	08/24/99	<0.01	1.0	<0.05	0.13	**0.01**	0.01	0.73	0.03	31	290
	08/17/00	<0.01	<0.2	<0.05	<0.05	<0.01	<0.01	<0.05	<0.01	11	300
MW-3	05/17/95	**0.23**	**13.48**	<0.1	0.24	<0.01	0.04	**8.65**	**0.24**	13	328
	08/24/99	<0.01	0.35	<0.05	0.09	<0.01	<0.01	0.22	<0.01	16	280
	08/17/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	<0.05	<0.01	11	300
MW-4	05/17/95	<0.01	2.44	**0.2**	0.69	<0.01	<0.01	**12.33**	0.15	**934**	**2,211**
MW-5	05/17/95	<0.01	**5.65**	**0.1**	**4.1**	<0.01	<0.01	**8.34**	**0.49**	**254**	937
	08/24/99	<0.01	<0.2	<0.05	**2.5**	<0.01	<0.01	**6.4**	**0.53**	**320**	**1,300**
	08/18/00	<0.01	<0.2	0.05	0.17	<0.01	<0.01	<0.05	**0.77**	240	**1,600**
MW-6	05/17/95	<0.01	**11.43**	**0.2**	**1.25**	<0.01	<0.01	**19.66**	**0.25**	181	**1,001**
MW-7	05/17/95	<0.01	**38.16**	**0.1**	0.45	**0.01**	**0.07**	**18.28**	**0.22**	113	713
	08/24/99	<0.01	<0.2	<0.05	0.87	<0.01	<0.01	0.06	<0.01	97	650
	08/17/00	<0.01	<0.2	<0.05	0.07	<0.01	<0.01	<0.05	<0.01	98	630
MW-8	05/17/95	<0.01	0.21	**0.2**	0.11	<0.01	<0.01	0.17	0.07	83	**1,366**
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	0.05	<0.01	25	350
	08/18/00	<0.01	<0.2	<0.05	0.19	<0.01	<0.01	<0.05	<0.01	9.4	290
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
NA indicates sample was analyzed for this constituent.

Table 4 (Continued)
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-9	05/17/95	<0.01	**26.58**	<0.1	0.3	<0.01	**0.06**	**12.08**	0.15	73	602
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	<0.03	<0.01	58	579
	08/15/97	<0.01	0.5	NA	NA	NA	<0.05	0.91	<0.01	53	**1,600**
	07/22/98	<0.002	<0.01	NA	NA	NA	<0.01	0.07	<0.01	53	580
	08/24/99	<0.01	<0.2	<0.05	0.12	<0.01	<0.01	<0.05	<0.01	52	580
	08/18/00	<0.01	<0.2	<0.05	0.14	<0.01	<0.01	<0.05	0.02	57	600
MW-10	05/17/95	<0.01	4.79	<0.1	0.18	<0.01	<0.01	**3.05**	**0.41**	98	903
	04/24/96	0.01	<0.2	NA	NA	NA	<0.01	0.26	**0.93**	72	909
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.01	0.61	**0.63**	120	**1,300**
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.002	**3.1**	**0.77**	67	820
	08/25/99	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	0.62	**0.69**	120	**1,200**
	08/18/00	<0.01	<0.2	<0.05	0.17	<0.01	<0.01	<0.05	**0.58**	100	**1,100**
MW-10D	05/17/95	<0.01	3.99	<0.1	0.17	**0.01**	0.02	**2.88**	**0.25**	59	707
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	0.22	0.17	72	861
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.39	**0.2**	78	910
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.01	0.6	0.15	82	690
	08/25/99	<0.01	0.2	<0.05	0.08	<0.01	<0.01	0.51	**0.28**	110	**1,000**
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	0.57	**0.38**	87	950
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
NA indicates sample was analyzed for this constituent.

Table 4 (Continued)
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant

Monitoring Well	Sample Date	WQCC Metal Constituents (mg/L)								Ions (mg/L)	
		Ag	Al	As	Ba	Cd	Cr	Fe	Mn	Cl	TDS
MW-11	05/17/95	<0.01	2.14	<0.1	0.1	<0.01	0.05	**1.34**	0.15	49	890
	04/24/96	0.02	<0.2	NA	NA	NA	<0.03	0.13	0.08	28	963
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.11	0.17	39	**1,200**
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.01	<0.05	0.09	31	**1,000**
	08/24/99	<0.01	<0.2	<0.05	0.08	<0.01	<0.01	<0.05	0.13	40	850
	08/18/00	<0.01	<0.2	<0.05	0.1	<0.01	<0.01	<0.05	0.16	44	830
MW-12	05/17/95	<0.01	**5.35**	<0.1	0.13	<0.01	0.03	**2.8**	0.07	225	**1,128**
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	<0.03	<0.01	91	736
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.48	0.05	**320**	**1,600**
	07/22/98	<0.002	<0.3	NA	NA	NA	<0.01	0.4	0.05	210	**1,100**
	08/24/99	<0.01	<0.2	<0.05	0.12	**0.03**	0.04	0.29	0.07	190	**1,300**
	08/18/00	<0.01	<0.2	<0.05	0.11	<0.01	<0.01	0.31	0.03	130	990
MW-13	05/17/95	**0.18**	**14.08**	<0.1	0.59	<0.01	<0.01	**7.02**	0.11	137	629
	04/24/96	<0.01	<0.2	NA	NA	NA	<0.05	<0.03	<0.01	96	667
	08/15/97	<0.01	<0.2	NA	NA	NA	<0.05	0.24	0.01	190	930
	07/22/98	<0.002	0.36	NA	NA	NA	<0.01	0.34	0.01	97	800
	08/24/99	<0.01	<0.2	0.06	0.22	**0.04**	0.04	0.08	0.05	140	930
	08/18/00	<0.01	<0.2	<0.05	0.18	<0.01	<0.01	<0.05	0.05	230	960
WQCC Standard		0.05	5.0	0.1	1.0	0.01	0.05	1.0	0.2	250	1,000

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element after 05-17-95, therefore results indicate total dissolved metals
NA indicates sample was analyzed for this constituent.

6.0 Intrinsic Bioremediation Assessment

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 averageadvective 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, the mass of benzene degraded per unit mass of electron acceptor utilized and metabolic byproduct produced was calculated 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	---	1.64	1.59
NO_3	Denitrification	Decreases	0.21*	---	6.74	1.72
Fe^{2+}	Ferric Iron Reduction	Increases	---	0.046	116.18	5.34
SO_4	Sulfate Reduction	Decreases	0.22*	---	77	32.37
					Total Biodegradation Capacity	41.02
					Highest benzene concentration observed on site	20.9
					Average benzene concentration observed on site	2.36

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

Field measurements of DO and groundwater samples of nitrate and sulfate (for laboratory analysis) have historically been recovered at the Linam Ranch Plant in order to monitor the changes in groundwater chemistry associated with biodegradation. Table 5 is a summary of the DO, nitrate, and

sulfate concentrations. Iron concentrations are included with the other WQCC metals listed on Table 4. None of these concentrations exceed the WQCC standards except for the nitrate levels observed in MW-1 (150 mg/L). Nitrate is commonly generated from fertilizing or septic sources; however, no such operations are known to exist in the area of monitoring well MW-1. Changes in dissolved oxygen, nitrate, and sulfate concentrations with time are depicted in Figures 5, 6, and 7, respectively.

Hydrocarbon-impacted wells (MW-5, MW-10, MW-10D, and MW-11) are compared against upgradient and downgradient wells 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 and sulfate concentrations fluctuate over time therefore no trend relationship is noted. However, the presence of these constituents as electron acceptors indicates their availability for use by microorganisms in the course of hydrocarbon degradation.

- Increased concentrations of metabolic byproducts iron and manganese in monitoring wells MW-5, MW-10, and MW-10D indicates iron and manganese reduction conditions that are the result of anaerobic biodegradation processes.

- The biodegradation capacity of electron acceptors and metabolic byproducts (37.42 mg/L) exceeds the highest benzene concentration (20.9 mg/L) observed on site. The biodegradation capacity of electron acceptors and metabolic byproducts far exceeds the average benzene concentration (2.39 mg/L) observed on site by a ratio of 15.7 to 1. This indicates that the biodegradation process will continue.

Table 5
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
MW-1	05/17/95	0.51	<0.3	**1,039**
	08/25/99	1.90	**120**	**660**
	02/22/00	3.37	**130**	570
	08/17/00	0.35	**150**	590
MW-2	05/17/95	1.60	0.81	62
	08/24/99	5.90	2.6	18
	02/22/00	4.47	2.8	17
	08/17/00	1.06	0.53	17
MW-3	05/17/95	4.88	3.71	126
	02/09/99	8.5	5.2	59
	08/24/99	7.61	3.7	35
	02/22/00	8.08	4.0	33
	08/17/00	7.48	1.9	44
MW-4	05/17/95	NS	<0.15	78
MW-5	05/17/95	NS	<0.15	67
	08/25/99	0.00	<1.0	84
	02/23/00	0.34	< 1.0	64
	08/18/00	0.10	<0.1	390
MW-6	05/17/95	NS	<0.15	72
MW-7	05/17/95	6.50	2.8	161
	08/24/99	6.70	5.5	120
	02/22/00	7.39	6.0	96
	08/17/00	6.98	3.0	98
MW-8	05/17/95	1.60	**33.4**	**602**
	08/24/99	4.88	3.2	31
	02/22/00	3.48	3.4	22
	08/18/00	5.13	13	16
MW-9	05/17/95	1.85	4.70	126
	11/14/95	2.82	NA	NA
	01/17/96	5.3	NA	NA
	04/24/96	2.0	0.2	60
	01/22/97	14.6	3.4	71
	08/15/97	3.8	3.4	82
	01/22/98	5.2	4.1	160
	07/20/98	2.38	5.4	72
	02/09/99	3.1	5.4	72
	08/24/99	3.16	4.5	76
	02/22/00	0.28	4.5	75
	08/18/00	0.60	1.3	81
WQCC Standards		---	10.0	600

NA indicates not analyzed for this constituent.
Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
Dissolved oxygen (DO) readings obtained with electronic DO meters.
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (Continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
MW-10	05/17/95	1.05	1.030	184
	11/14/95	1.98	<0.01	174
	01/17/96	5.0	<0.5	40
	04/24/96	1.6	<0.1	16
	01/22/97	8.75	<0.1	25
	08/15/97	2.9	< 1.0	210
	01/22/98	4.5	0.22	52
	07/22/98	1.13	3.50	40
	02/09/99	1.6	3.50	40
	08/25/99	0.00	<1.0	200
	02/23/00	0.47	< 1.0	180
	08/18/00	NA	<0.1	200
MW-10D	05/17/95	0.45	0.63	232
	11/14/95	2.41	NA	NA
	01/17/96	5.0	NA	NA
	04/24/96	1.8	<0.1	21
	01/22/97	5.5	<0.1	210
	08/15/97	1.8	< 1.0	180
	01/22/98	5.7	1.30	230
	07/22/98	1.49	4.0	140
	07/22/98	1.9	4.0	140
	08/25/99	1.54	2.4	220
	02/23/00	3.03	2.7	220
	08/18/00	0.50	<0.1	250
MW-11	05/17/95	1.05	**28.6**	190
	11/14/95	2.30	1.56	184
	01/17/96	2.8	**43.3**	150
	04/24/96	2.0	1.9	124
	01/22/97	7.0	**24**	170
	08/15/97	1.8	**40**	160
	01/22/98	4.3	**58**	150
	07/22/98	1.06	**19**	200
	02/09/99	1.4	**19**	200
	08/24/99	0.09	8.0	120
	02/23/00	0.58	7.0	120
	08/18/00	0.00	3.1	120
WQCC Standards		---	10.0	600

NA indicates not analyzed for this constituent.
Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
Dissolved oxygen (DO) readings obtained with electronic DO meters.
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

Table 5 (Continued)
Summary of Biological Parameter Results
Linam Ranch Plant

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
MW-12	05/17/95	0.97	1.01	206
	11/14/95	3.15	NA	NA
	01/17/96	1.7	NA	NA
	04/24/96	1.8	<0.1	53
	01/22/97	11.8	<0.1	150
	08/15/97	1.9	< 1.0	210
	01/22/98	4.2	0.41	150
	07/22/98	2.52	0.71	130
	02/09/99	3.7	0.71	130
	08/24/99	0.14	<1.0	200
	02/22/00	0.81	3.10	73
	08/18/00	0.26	<0.1	120
MW-13	05/17/95	1.51	5.00	99
	11/14/95	5.00	0.02	44
	01/17/96	2.0	6.54	42
	04/24/96	2.6	0.2	46
	01/22/97	9.5	5.4	65
	08/15/97	5.1	4.5	78
	01/22/98	7.4	7.3	88
	07/20/98	3.62	**12**	74
	02/09/99	2.7	**12**	74
	08/24/99	0.30	**16**	83
	02/23/00	0.59	9.1	86
	08/18/00	0.31	3.2	100
WQCC Standards		---	10.0	600

NA indicates not analyzed for this constituent.
Analyses performed by Trace Analysis, Inc., Lubbock, Texas.
Dissolved oxygen (DO) readings obtained with electronic DO meters.
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

FIGURE 5A
Dissolved Oxygen Concentrations Versus Time
(WEST SIDE OF PLANT)

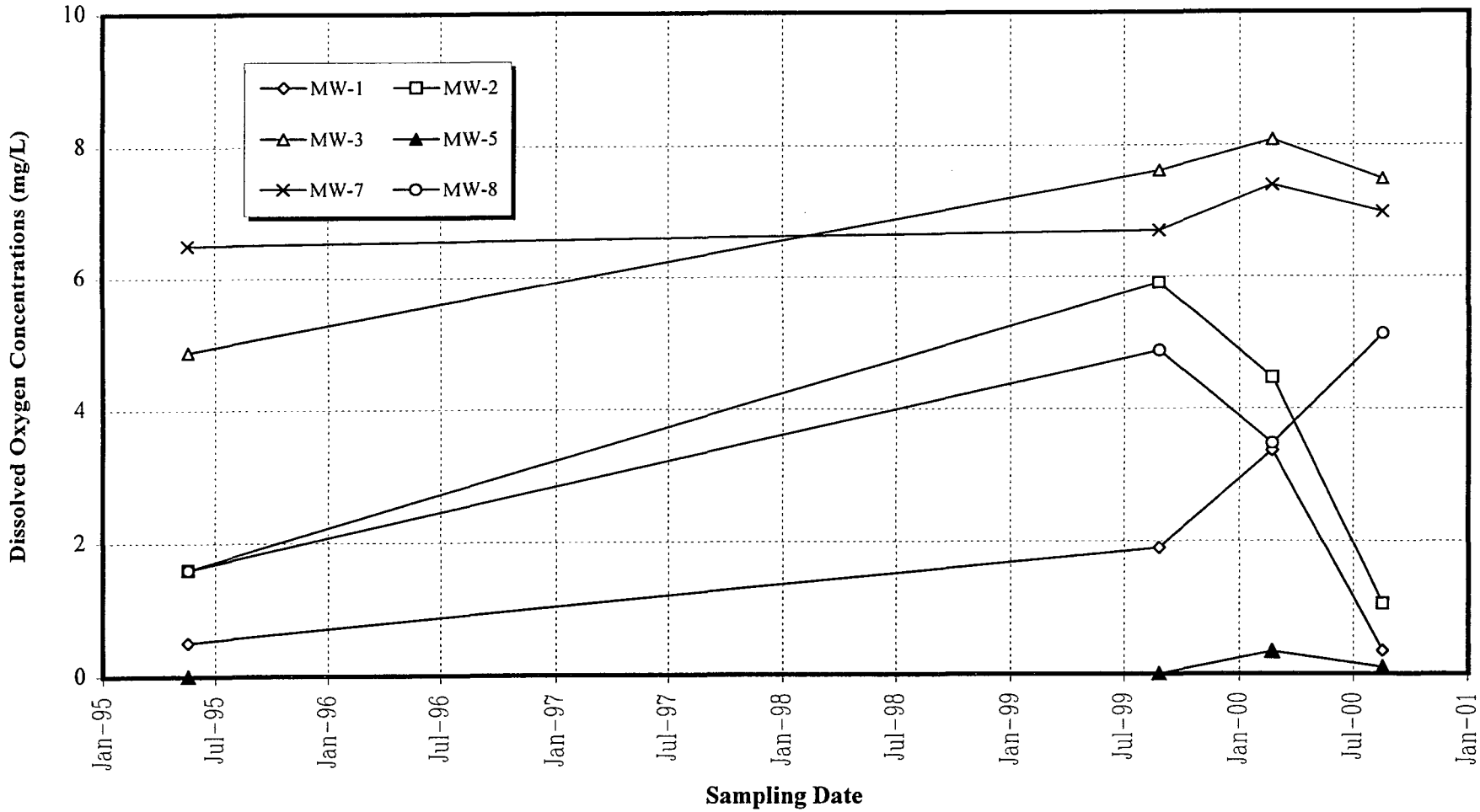


FIGURE 5B
Dissolved Oxygen Concentrations Versus Time
(EAST SIDE OF PLANT)

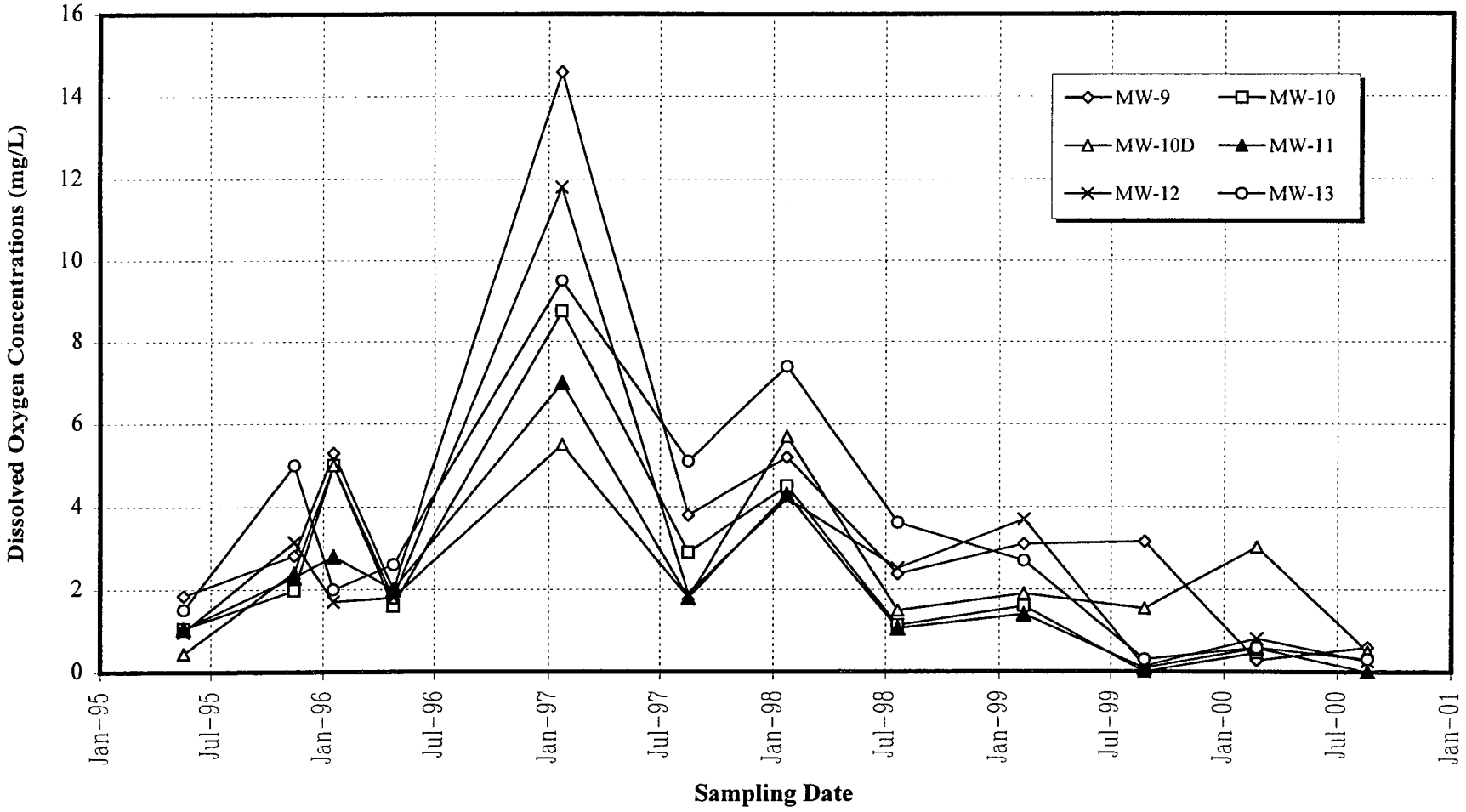


FIGURE 6A
Nitrate Concentrations Versus Time
(WEST SIDE OF PLANT)

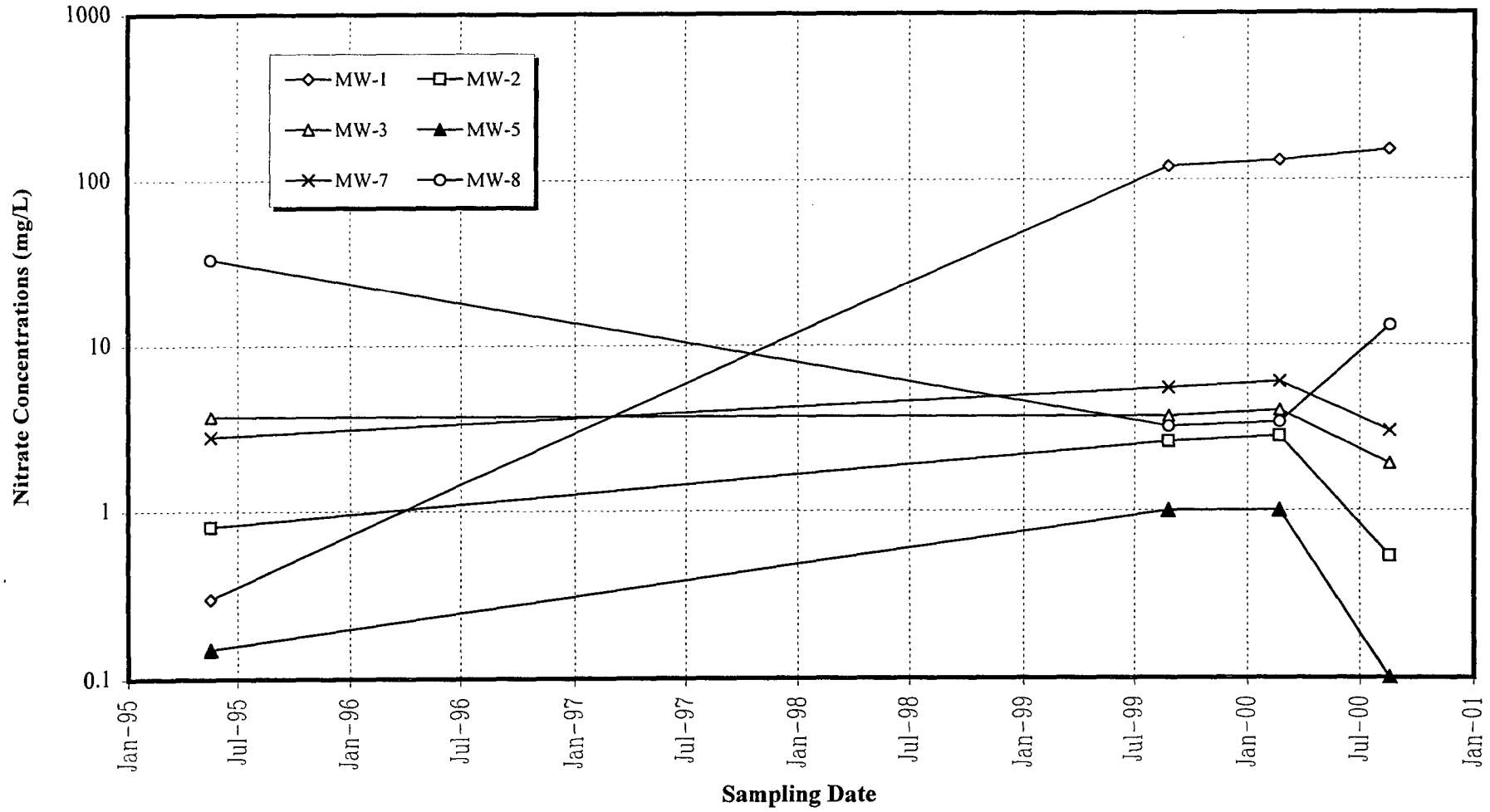


FIGURE 6B
Nitrate Concentrations Versus Time
(EAST SIDE OF PLANT)

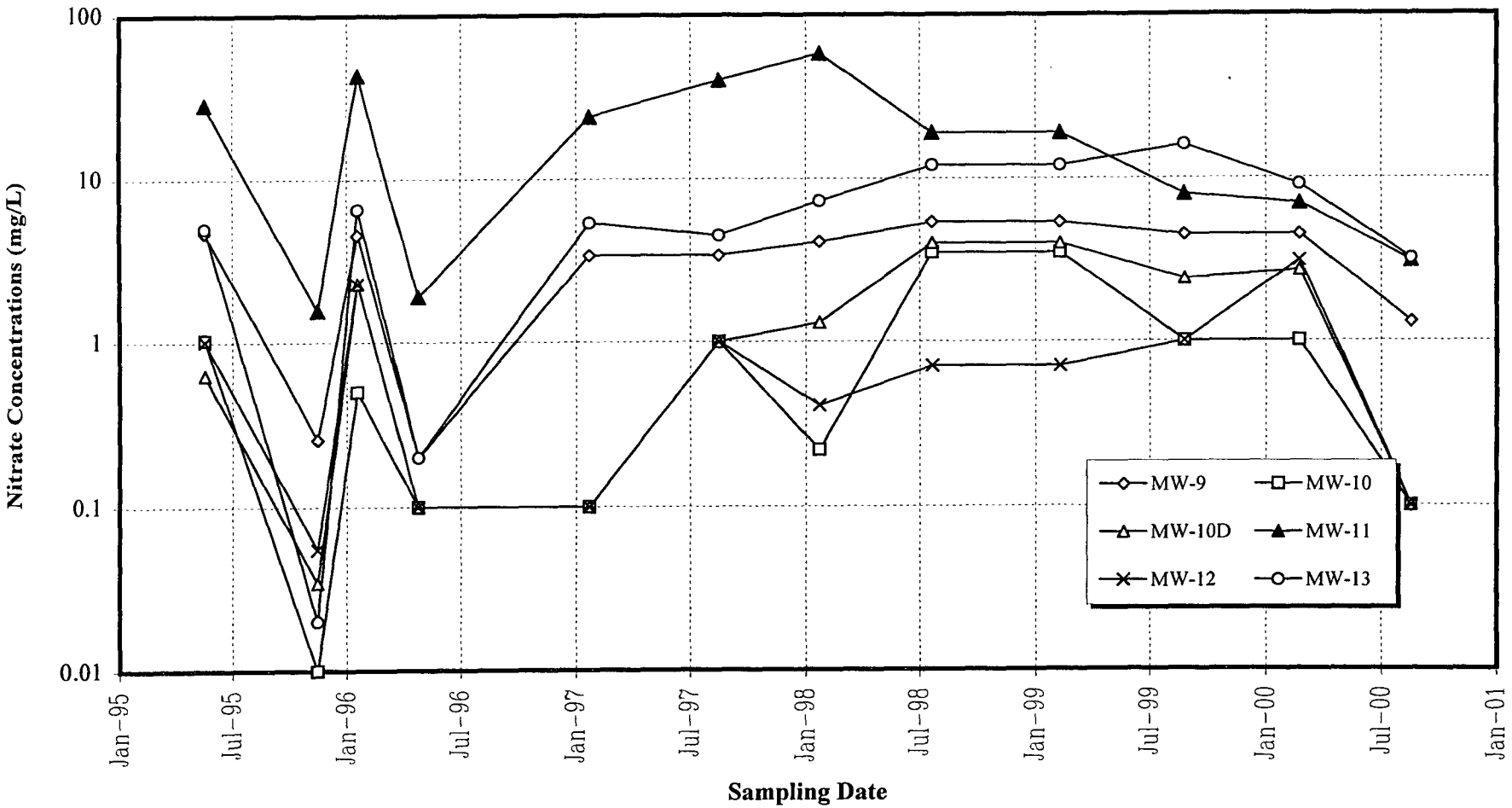


FIGURE 7A
Sulfate Concentrations Versus Time
(WEST SIDE OF PLANT)

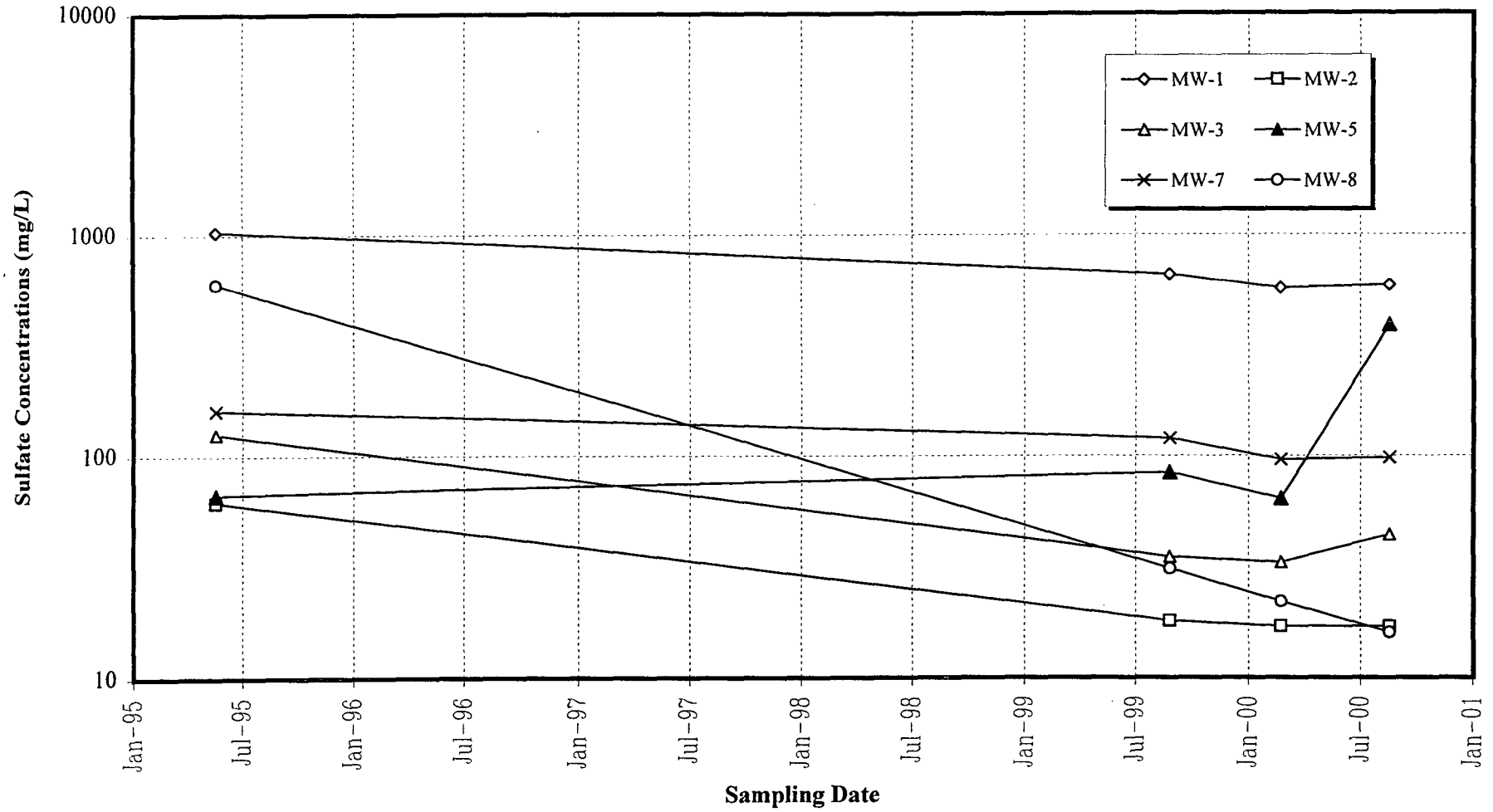
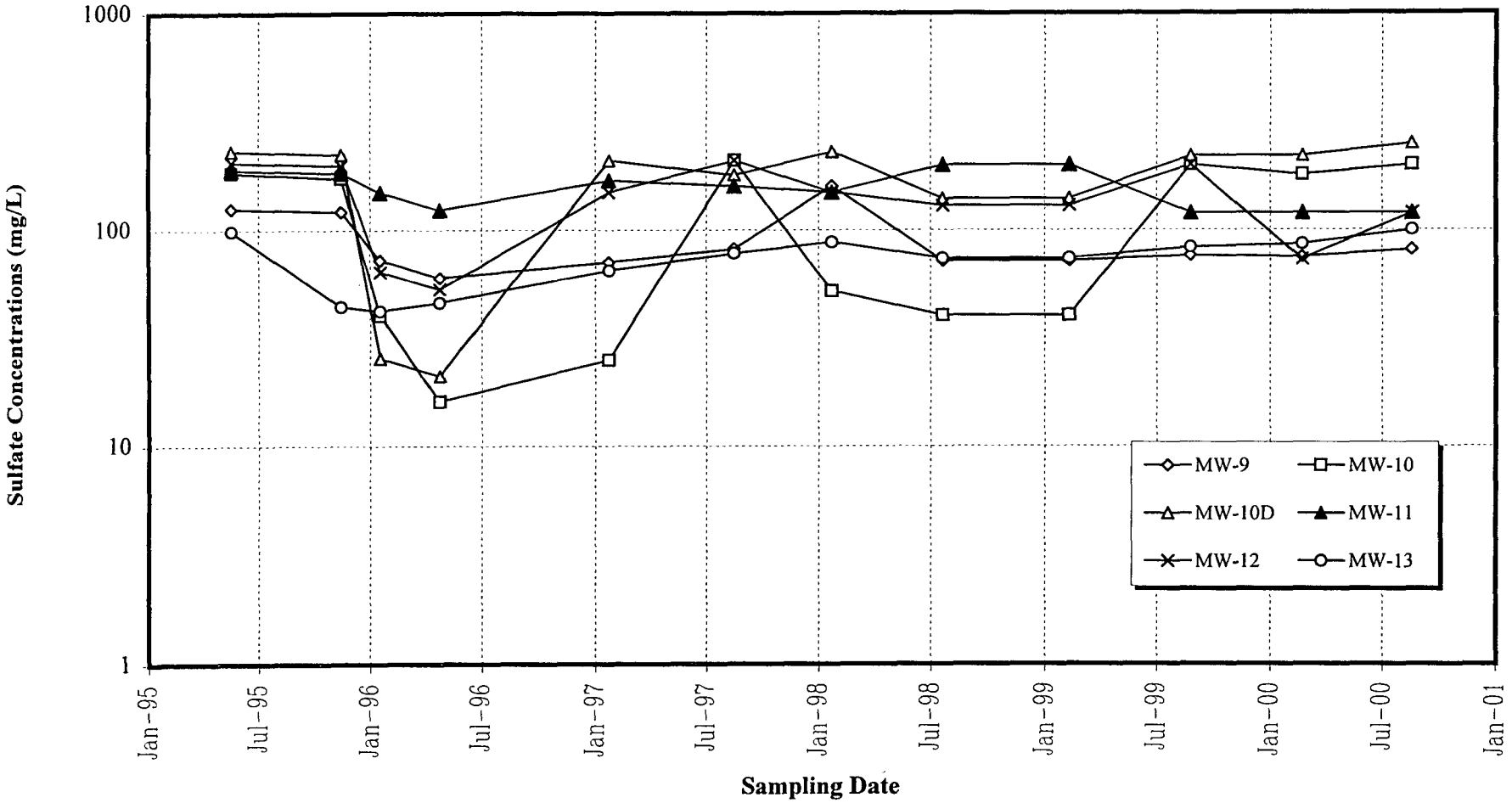


FIGURE 7B
Sulfate Concentrations Versus Time
(EAST SIDE OF PLANT)



7.0 Free Product Recovery

Hydrophobic adsorbent socks were used in monitoring wells MW-4 and MW-6 to recover free product from the groundwater beneath the former oil/water separator system at Linam Ranch Plant. As of October 2, 2000, the product recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 12 gallons of free product from MW-4 and MW-6. Product thickness and recovery volumes are listed on Table 6. Figures 8A and 8B graphically depict the produce thickness and cumulative recovery versus time for MW-4 and MW-6, respectively.

Table 6
Product Recovery Volumes
Linam Ranch Plant

Date	Product Thickness (feet)		Product Recovered (gallons)		Cumulative Product Recovered (gallons)
	MW-4	MW-6	MW-4	MW-6	
04/22/98	0.43	0.05	0.09	0.04	0.13
05/06/98	0.44	0.03	0.08	0.03	0.24
06/23/98	0.47	0.07	0.35	0.00	0.60
07/20/98	0.36	0.08	0.38	0.00	0.98
08/07/98	0.16	0.12	0.35	0.00	1.33
09/17/98	0.09	0.19	0.35	0.01	1.68
10/28/98	0.05	0.00	0.36	0.01	2.05
11/17/98	0.04	0.02	0.14	0.01	2.19
12/15/98	0.06	<0.01	0.35	0.01	2.55
01/18/99	0.11	0.01	0.37	0.00	2.92
02/09/99	0.13	<0.01	0.38	0.00	3.30
03/24/99	0.53	0.07	0.40	0.41	4.11
04/21/99	0.72	0.01	0.94	0.00	5.05
05/13/99	1.00	0.03	0.45	0.00	5.50
06/14/99	1.32	0.01	0.47	0.00	5.96
08/04/99	1.10	<0.01	0.46	0.00	6.42
08/20/99	1.11	<0.01	0.45	0.00	6.87
08/25/99	0.88	<0.01	0.42	0.00	7.29
09/14/99	0.70	0.00	0.43	0.00	7.72
10/26/99	0.45	<0.01	0.42	0.00	8.14
11/22/99	0.37	<0.01	0.42	0.00	8.56
12/22/99	0.23	0.01	0.42	0.00	8.98
01/26/00	0.12	<0.01	0.40	0.25	9.63
02/22/00	0.03	<0.01	0.18	0.20	10.01
04/04/00	<0.01	0.00	0.13	0.00	10.14
04/24/00	0.05	0.16	0.02	0.00	10.16
06/15/00	0.03	0.48	0.13	0.71	11.00
07/12/00	<0.01	<0.01	0.03	0.04	11.07
08/18/00	0.00	<0.01	0.002	0.002	11.08
10/02/00	<0.01	0.70	0.00	0.84	11.92
Total Volume of Product Recovered On Site:					**11.92**

Product recovery methods used:
MW-4: Hydrophobic (oil adsorbent) sock (passive bailer replaced with sock on 08-18-00).
MW-6: Hydrophobic (oil adsorbent) sock (passive bailer replaced with sock on 09-17-98).

FIGURE 8A
Product Thickness and Recovery Versus Time (MW-4)

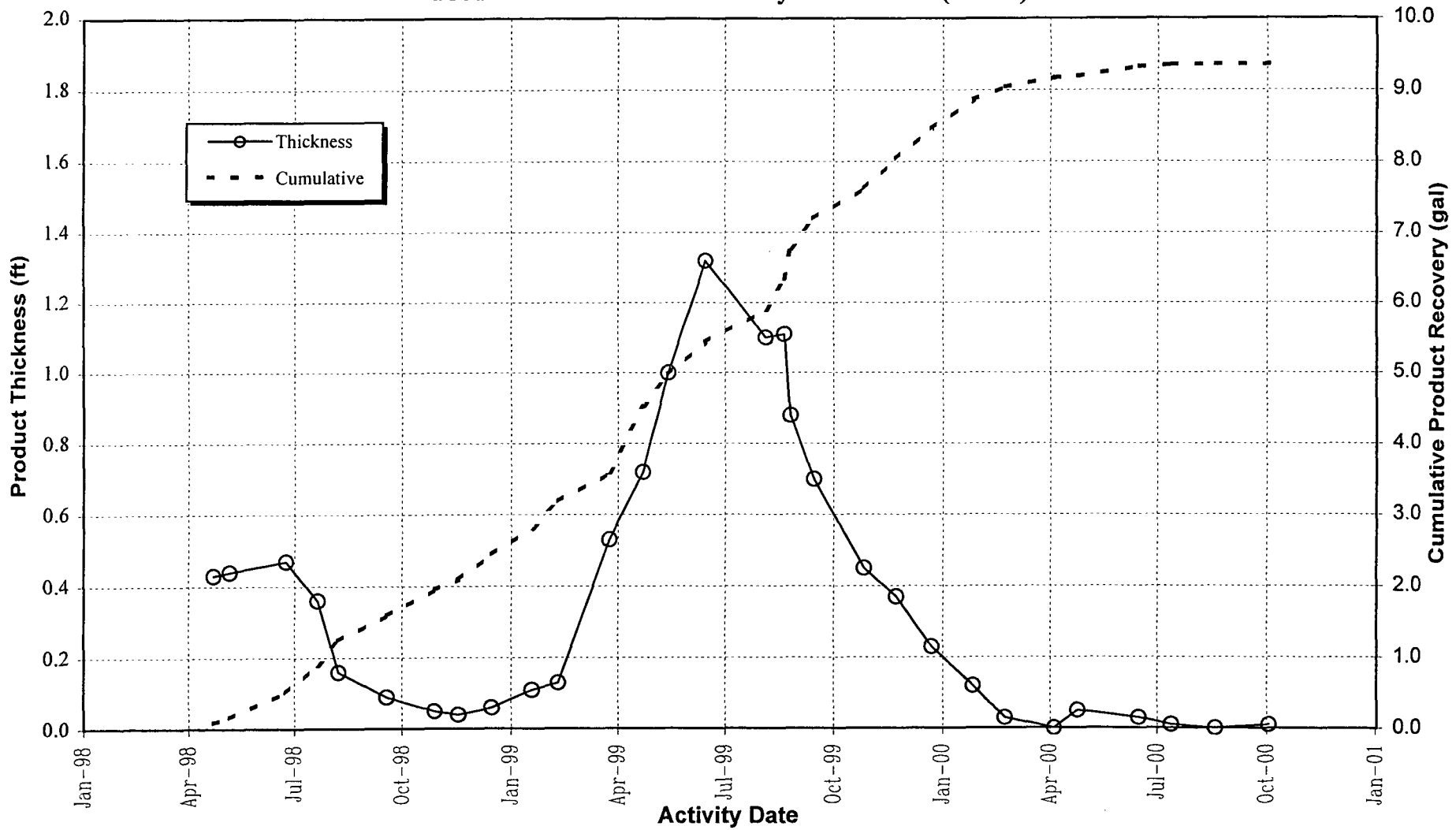
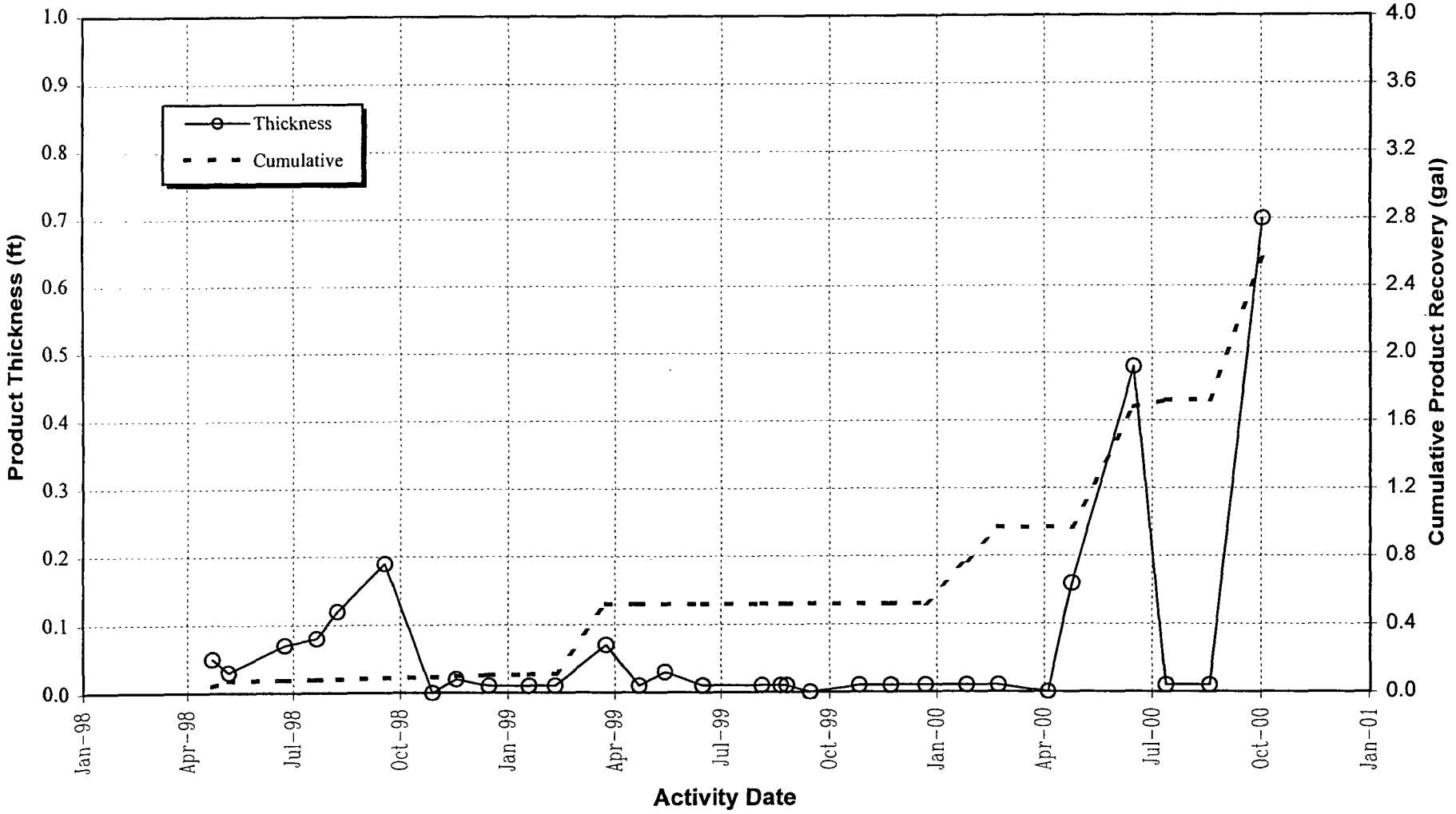


FIGURE 8B
Product Thickness and Recovery Versus Time (MW-6)



8.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Linam Ranch Plant are presented below.

- BTEX concentrations in monitoring wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-8, MW-10D, MW-11, and MW-12 were below the New Mexico WQCC standards for each constituent.

- Benzene levels in MW-9 (0.036 mg/L), MW-10 (3.11 mg/L), and MW-13 (0.04 mg/L) exceed the WQCC standard of 0.010 mg/L. The toluene, ethylbenzene, and xylene concentrations were below WQCC standards for each of these wells.

- Benzene concentrations in MW-9 (located downgradient from the EOTT tank area) have increased over the last two semi-annual sampling events. The concentrations in all of the other measured hydrocarbon constituents have remained below the laboratory detection levels.

- Dissolved hydrocarbon concentrations in MW-10 (located near the EOTT tank source area) and MW-10D (deeper completed twin to MW-10) have remained stable to decreasing since monitoring began in 1995.

- Dissolved hydrocarbon concentrations in MW-11 (located between the former oil/water separator system and EOTT tank source areas) have also decreased since monitoring began in 1995 and now appear be stabilizing at or below the WQCC standard levels.

- Benzene concentrations in MW-13 (located downgradient from the EOTT tank area) have remained stable (0.04 mg/L to 0.08 mg/L) since the August 1997 sampling event. The concentrations in all of the other measured hydrocarbon constituents have remained at or below the laboratory detection levels.

- It is suspected that the increased levels of dissolved hydrocarbons in MW-13 represents the downgradient movement of a limited slug of contaminants that was observed in upgradient well MW-10 during the April 24, 1996 sampling event. Preliminary estimates, based on the maximum benzene levels observed in each well indicate that the benzene slug is migrating at approximately 0.49 feet per day and attenuating at a rate of approximately one half-life per 40 feet. At this rate the benzene slug should not represent an environmental threat to potential future receptors within 160 feet southwest of MW-13.

- The dissolved-phase hydrocarbons in groundwater are localized near the former oil/water separator system (liquid waste disposal area) and the EOTT tank area. There are no indications that the hydrocarbon plume in the groundwater has migrated beyond the boundaries of the facility.

- As of October 2, 2000, the product recovery activities at Linam Ranch Plant have been successful at removing a total of approximately 12 gallons of free product (condensate)

from monitoring wells MW-4 and MW-6. The measured thickness of product in MW-4 has remained below 0.05 feet during the 2000 monitoring period. The product thickness in MW-6 has historically been less than 0.02 feet, however observations made during three of the last five site visits indicate that the thickness of product is increasing.

- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards in some monitoring wells, increased levels of these constituents indicate intrinsic bioremediation processes are active.

- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.

9.0 Recommendations

The following corrective actions are recommended for Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 2001.
- Discontinue analyses for aluminum, barium, and silver since these constituents have been below the WQCC standards for over five years.
- Continue free product removal from MW-4 and MW-6 using absorbent socks with monthly inspections.

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 and Quality Control Report

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

Report Date: September 11, 2000

Order ID Number: A00082201

Project Number: GPM Gas Co LLC
Project Name: E2L14G0-70210
Project Location: Linam Ranch Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
151885	MW-7	Water	8/17/00	15:30	8/22/00
151886	MW-3	Water	8/17/00	17:05	8/22/00
151887	MW-2	Water	8/17/00	17:45	8/22/00
151888	MW-1	Water	8/18/00	18:20	8/22/00
151889	MW-8	Water	8/18/00	8:45	8/22/00
151890	MW-12	Water	8/18/00	10:50	8/22/00
151891	MW-9	Water	8/18/00	12:00	8/22/00
151892	MW-11	Water	8/18/00	11:20	8/22/00
151893	MW-10	Water	8/18/00	14:20	8/22/00
151894	MW-10D	Water	8/18/00	14:45	8/22/00
151895	MW-13	Water	8/18/00	11:20	8/22/00
151896	MW-5	Water	8/18/00	15:50	8/22/00
151897	Duplicate	Water	8/18/00	:	8/22/00
151898	Rinsate	Water	8/18/00	16:30	8/22/00
151932	Trip Blank	Water	7/18/00	:	8/22/00

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 31 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical and Quality Control Report

Sample: 151885 - MW-7

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04514 Date Analyzed: 8/28/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB03934 Date Prepared: 8/28/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.389	mg/L	1	0.10	77	72 - 128
4-BFB		0.373	mg/L	1	0.10	74	72 - 128

Sample: 151885 - MW-7

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04478 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.07	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		<0.01	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151885 - MW-7

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04404 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		98	mg/L	1	0.50
Sulfate		98	mg/L	1	0.50

Sample: 151885 - MW-7

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04646 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		3.0	mg/L	1	0.10

Sample: 151885 - MW-7

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04422 Date Analyzed: 8/23/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03855 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		630	mg/L	1	10

Sample: 151886 - MW-3

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04514 Date Analyzed: 8/28/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB03934 Date Prepared: 8/28/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.44	mg/L	1	0.10	88	72 - 128
4-BFB		0.407	mg/L	1	0.10	81	72 - 128

Sample: 151886 - MW-3

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04478 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.11	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		<0.01	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151886 - MW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04404 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		11	mg/L	1	0.50
Sulfate		44	mg/L	1	0.50

Sample: 151886 - MW-3

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04646 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		1.9	mg/L	1	0.10

Sample: 151886 - MW-3

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04422 Date Analyzed: 8/23/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03855 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		300	mg/L	1	10

Sample: 151887 - MW-2

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04514 Date Analyzed: 8/28/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB03934 Date Prepared: 8/28/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		<0.001	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.09	mg/L	1	0.10	90	72 - 128
4-BFB		0.082	mg/L	1	0.10	82	72 - 128

Sample: 151887 - MW-2

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04478 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		<0.05	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05

Continued ...

...Continued Sample: 151887 Analysis: Dissolved Metals

Param	Flag	Result	Units	Dilution	RDL
Dissolved Manganese		<0.01	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151887 - MW-2

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04404 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		11	mg/L	1	0.50
Sulfate		17	mg/L	1	0.50

Sample: 151887 - MW-2

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04646 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		0.53	mg/L	1	0.10

Sample: 151887 - MW-2

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04422 Date Analyzed: 8/23/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03855 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		300	mg/L	1	10

Sample: 151888 - MW-1

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04514 Date Analyzed: 8/28/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB03934 Date Prepared: 8/28/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.001	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.011	mg/L	1	0.001
Total BTEX		0.011	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.116	mg/L	1	0.10	116	72 - 128
4-BFB		0.121	mg/L	1	0.10	121	72 - 128

Sample: 151888 - MW-1

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04478 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		<0.05	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		<0.01	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151888 - MW-1

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04404 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		160	mg/L	1	0.50
Sulfate		590	mg/L	1	0.50

Sample: 151888 - MW-1

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04422 Date Analyzed: 8/23/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03855 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		2700	mg/L	1	10

Sample: 151889 - MW-8

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04514 Date Analyzed: 8/28/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB03934 Date Prepared: 8/28/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.002	mg/L	1	0.001
Toluene		<0.001	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.002	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.121	mg/L	1	0.10	121	72 - 128
4-BFB		0.128	mg/L	1	0.10	128	72 - 128

Sample: 151889 - MW-8

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04478 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.19	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		<0.01	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151889 - MW-8

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04405 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		9.4	mg/L	1	0.50
Sulfate		16	mg/L	1	0.50

Sample: 151889 - MW-8

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04646 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		13	mg/L	1	0.10

Sample: 151889 - MW-8

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04443 Date Analyzed: 8/24/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03874 Date Prepared: 8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		290	mg/L	1	10

Sample: 151890 - MW-12

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04663 Date Analyzed: 9/1/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB04068 Date Prepared: 9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.438	mg/L	1	0.10	87	72 - 128
4-BFB		0.383	mg/L	1	0.10	76	72 - 128

Sample: 151890 - MW-12

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04478 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.11	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		0.31	mg/L	1	0.05
Dissolved Manganese		0.03	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151890 - MW-12

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04405 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		130	mg/L	1	0.50
Sulfate		120	mg/L	1	0.50

Sample: 151890 - MW-12

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04646 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		<0.10	mg/L	1	0.10

Sample: 151890 - MW-12

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04443 Date Analyzed: 8/24/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03874 Date Prepared: 8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		990	mg/L	1	10

Sample: 151891 - MW-9

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04663 Date Analyzed: 9/1/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB04068 Date Prepared: 9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.036	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.036	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.433	mg/L	1	0.10	86	72 - 128
4-BFB		0.38	mg/L	1	0.10	76	72 - 128

Sample: 151891 - MW-9

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04478 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.14	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		0.02	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151891 - MW-9

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04405 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		57	mg/L	1	0.50
Sulfate		81	mg/L	1	0.50

Sample: 151891 - MW-9

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04646 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		1.3	mg/L	1	0.10

Sample: 151891 - MW-9

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04443 Date Analyzed: 8/24/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03874 Date Prepared: 8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		600	mg/L	1	10

Sample: 151892 - MW-11

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04663	Date Analyzed:	9/1/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB04068	Date Prepared:	9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.009	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.009	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.422	mg/L	1	0.10	84	72 - 128
4-BFB		0.381	mg/L	1	0.10	76	72 - 128

Sample: 151892 - MW-11

Analysis:	Dissolved Metals	Analytical Method:	S 6010B	QC Batch:	QC04478	Date Analyzed:	8/24/00
Analyst:	RR	Preparation Method:	E 3005A	Prep Batch:	PB03848	Date Prepared:	8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.10	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		0.16	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151892 - MW-11

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC04405	Date Analyzed:	8/22/00
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB03835	Date Prepared:	8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		44	mg/L	1	0.50
Sulfate		120	mg/L	1	0.50

Sample: 151892 - MW-11

Analysis:	NO3	Analytical Method:	SM 4500-NO3 E	QC Batch:	QC04646	Date Analyzed:	8/29/00
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB04050	Date Prepared:	8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		3.1	mg/L	1	0.10

Sample: 151892 - MW-11

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC04443	Date Analyzed:	8/24/00
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB03874	Date Prepared:	8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		830	mg/L	1	10

Sample: 151893 - MW-10

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04663	Date Analyzed:	9/1/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB04068	Date Prepared:	9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		3.11	mg/L	5	0.001
Toluene		0.025	mg/L	5	0.001
Ethylbenzene		0.072	mg/L	5	0.001
M,P,O-Xylene		0.038	mg/L	5	0.001
Total BTEX		3.24	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.438	mg/L	1	0.10	87	72 - 128
4-BFB		0.388	mg/L	1	0.10	77	72 - 128

Sample: 151893 - MW-10

Analysis:	Dissolved Metals	Analytical Method:	S 6010B	QC Batch:	QC04478	Date Analyzed:	8/24/00
Analyst:	RR	Preparation Method:	E 3005A	Prep Batch:	PB03848	Date Prepared:	8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.17	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		0.58	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151893 - MW-10

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC04405	Date Analyzed:	8/22/00
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB03835	Date Prepared:	8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		100	mg/L	1	0.50
Sulfate		200	mg/L	1	0.50

Sample: 151893 - MW-10

Analysis:	NO3	Analytical Method:	SM 4500-NO3 E	QC Batch:	QC04647	Date Analyzed:	8/29/00
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB04050	Date Prepared:	8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		<0.10	mg/L	1	0.10

Sample: 151893 - MW-10

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC04443	Date Analyzed:	8/24/00
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB03874	Date Prepared:	8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1100	mg/L	1	10

Sample: 151894 - MW-10D

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04663	Date Analyzed:	9/1/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB04068	Date Prepared:	9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.441	mg/L	1	0.10	88	72 - 128
4-BFB		0.378	mg/L	1	0.10	75	72 - 128

Sample: 151894 - MW-10D

Analysis:	Dissolved Metals	Analytical Method:	S 6010B	QC Batch:	QC04478	Date Analyzed:	8/24/00
Analyst:	RR	Preparation Method:	E 3005A	Prep Batch:	PB03848	Date Prepared:	8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.10	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		0.57	mg/L	1	0.05

Continued ...

...Continued Sample: 151894 Analysis: Dissolved Metals

Param	Flag	Result	Units	Dilution	RDL
Dissolved Manganese		0.38	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151894 - MW-10D

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04405 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		87	mg/L	1	0.50
Sulfate		250	mg/L	1	0.50

Sample: 151894 - MW-10D

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04647 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		<0.10	mg/L	1	0.10

Sample: 151894 - MW-10D

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04443 Date Analyzed: 8/24/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03874 Date Prepared: 8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		950	mg/L	1	10

Sample: 151895 - MW-13

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04663 Date Analyzed: 9/1/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB04068 Date Prepared: 9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.04	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.04	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.439	mg/L	1	0.10	87	72 - 128
4-BFB		0.385	mg/L	1	0.10	77	72 - 128

Sample: 151895 - MW-13

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04479 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		<0.05	mg/L	1	0.05
Dissolved Barium		0.18	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		0.05	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151895 - MW-13

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04405 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		230	mg/L	1	0.50
Sulfate		100	mg/L	1	0.50

Sample: 151895 - MW-13

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04647 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		3.2	mg/L	1	0.10

Sample: 151895 - MW-13

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04443 Date Analyzed: 8/24/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03874 Date Prepared: 8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		960	mg/L	1	10

Sample: 151896 - MW-5

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04663 Date Analyzed: 9/1/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB04068 Date Prepared: 9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		0.006	mg/L	5	0.001
M,P,O-Xylene		0.008	mg/L	5	0.001
Total BTEX		0.014	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.456	mg/L	1	0.10	91	72 - 128
4-BFB		0.394	mg/L	1	0.10	78	72 - 128

Sample: 151896 - MW-5

Analysis: Dissolved Metals Analytical Method: S 6010B QC Batch: QC04479 Date Analyzed: 8/24/00
Analyst: RR Preparation Method: E 3005A Prep Batch: PB03848 Date Prepared: 8/24/00

Param	Flag	Result	Units	Dilution	RDL
Dissolved Aluminum		<0.20	mg/L	1	0.20
Dissolved Arsenic		0.05	mg/L	1	0.05
Dissolved Barium		0.17	mg/L	1	0.005
Dissolved Cadmium		<0.01	mg/L	1	0.01
Dissolved Chromium		<0.01	mg/L	1	0.01
Dissolved Iron		<0.05	mg/L	1	0.05
Dissolved Manganese		0.77	mg/L	1	0.01
Dissolved Silver		<0.01	mg/L	1	0.01

Sample: 151896 - MW-5

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04405 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
CL		240	mg/L	1	0.50
Sulfate		390	mg/L	1	0.50

Sample: 151896 - MW-5

Analysis: NO3 Analytical Method: SM 4500-NO3 E QC Batch: QC04647 Date Analyzed: 8/29/00
Analyst: JS Preparation Method: N/A Prep Batch: PB04050 Date Prepared: 8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-N		<0.10	mg/L	1	0.10

Sample: 151896 - MW-5

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC04443 Date Analyzed: 8/24/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03874 Date Prepared: 8/23/00

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1600	mg/L	1	10

Sample: 151897 - Duplicate

Analysis: BTEX Analytical Method: S 8021B QC Batch: QC04663 Date Analyzed: 9/1/00
Analyst: RC Preparation Method: 5035 Prep Batch: PB04068 Date Prepared: 9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.038	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.038	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.435	mg/L	1	0.10	87	72 - 128
4-BFB		0.368	mg/L	1	0.10	73	72 - 128

Sample: 151898 - Rinsate

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04663	Date Analyzed:	9/1/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB04068	Date Prepared:	9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.527	mg/L	1	0.10	105	72 - 128
4-BFB		0.456	mg/L	1	0.10	91	72 - 128

Sample: 151932 - Trip Blank

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC04672	Date Analyzed:	9/1/00
Analyst:	RC	Preparation Method:	5035	Prep Batch:	PB04068	Date Prepared:	9/1/00

Param	Flag	Result	Units	Dilution	RDL
Benzene		<0.005	mg/L	5	0.001
Toluene		<0.005	mg/L	5	0.001
Ethylbenzene		<0.005	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		<0.005	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.564	mg/L	5	0.10	112	72 - 128
4-BFB		0.509	mg/L	5	0.10	101	72 - 128

Quality Control Report
Method Blank

Sample: Method Blank QCBatch: QC04404

Param	Flag	Results	Units	Reporting Limit
CL		<0.5	mg/L	0.50
Sulfate		<0.5	mg/L	0.50

Sample: Method Blank QCBatch: QC04405

Param	Flag	Results	Units	Reporting Limit
CL		<0.5	mg/L	0.50
Sulfate		<0.5	mg/L	0.50

Sample: Method Blank QCBatch: QC04422

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Sample: Method Blank QCBatch: QC04443

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids	[1]	25	mg/L	10

Sample: Method Blank QCBatch: QC04478

Param	Flag	Results	Units	Reporting Limit
Dissolved Aluminum		<0.20	mg/L	0.20
Dissolved Arsenic		<0.05	mg/L	0.05
Dissolved Barium		<0.05	mg/L	0.005
Dissolved Cadmium		<0.01	mg/L	0.01
Dissolved Chromium		<0.01	mg/L	0.01
Dissolved Iron		<0.05	mg/L	0.05
Dissolved Manganese		<0.01	mg/L	0.01
Dissolved Silver		<0.01	mg/L	0.01

[1] *There was fuzz in the crucible which may have come from the glassware or the oven.*

Sample: Method Blank QCBatch: QC04479

Param	Flag	Results	Units	Reporting Limit
Dissolved Aluminum		<0.20	mg/L	0.20
Dissolved Arsenic		<0.05	mg/L	0.05
Dissolved Barium		<0.05	mg/L	0.005
Dissolved Cadmium		<0.01	mg/L	0.01
Dissolved Chromium		<0.01	mg/L	0.01
Dissolved Iron		<0.05	mg/L	0.05
Dissolved Manganese		<0.01	mg/L	0.01
Dissolved Silver		<0.01	mg/L	0.01

Sample: Method Blank QCBatch: QC04514

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Sample: Method Blank QCBatch: QC04646

Param	Flag	Results	Units	Reporting Limit
NO3-N		<0.10	mg/L	0.10

Sample: Method Blank QCBatch: QC04647

Param	Flag	Results	Units	Reporting Limit
NO3-N		<0.10	mg/L	0.10

Sample: Method Blank QCBatch: QC04663

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Spike Amount	Percent Recovery	Recovery Limit
TFT		0.09	mg/L	0.10	90	72 - 128
4-BFB		0.078	mg/L	0.10	78	72 - 128

Sample: Method Blank

QCBatch: QC04672

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Sample: LCS

QC Batch: QC04478

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		1.99	mg/L	1	2	<0.20	99		75 - 125	20
Dissolved Arsenic		0.98	mg/L	1	1	<0.05	98		75 - 125	20
Dissolved Barium		2.06	mg/L	1	2	<0.05	103		75 - 125	20
Dissolved Cadmium		0.20	mg/L	1	0.20	<0.01	100		75 - 125	20
Dissolved Chromium		0.41	mg/L	1	0.40	<0.01	102		75 - 125	20
Dissolved Iron		2.08	mg/L	1	2	<0.05	104		75 - 125	20
Dissolved Manganese		0.21	mg/L	1	0.20	<0.01	105		75 - 125	20
Dissolved Silver		0.20	mg/L	1	0.20	<0.01	100		75 - 125	20

Sample: LCSD

QC Batch: QC04478

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		2.02	mg/L	1	2	<0.20	101	1	75 - 125	20
Dissolved Arsenic		0.99	mg/L	1	1	<0.05	99	1	75 - 125	20
Dissolved Barium		2.09	mg/L	1	2	<0.05	104	1	75 - 125	20
Dissolved Cadmium		0.20	mg/L	1	0.20	<0.01	100	0	75 - 125	20
Dissolved Chromium		0.42	mg/L	1	0.40	<0.01	105	2	75 - 125	20
Dissolved Iron		2.10	mg/L	1	2	<0.05	105	1	75 - 125	20
Dissolved Manganese		0.21	mg/L	1	0.20	<0.01	105	0	75 - 125	20
Dissolved Silver		0.20	mg/L	1	0.20	<0.01	100	0	75 - 125	20

Sample: LCS QC Batch: QC04479

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		1.99	mg/L	1	2	<0.20	99		75 - 125	20
Dissolved Arsenic		0.98	mg/L	1	1	<0.05	98		75 - 125	20
Dissolved Barium		2.06	mg/L	1	2	<0.05	103		75 - 125	20
Dissolved Cadmium		0.20	mg/L	1	0.20	<0.01	100		75 - 125	20
Dissolved Chromium		0.41	mg/L	1	0.40	<0.01	102		75 - 125	20
Dissolved Iron		2.08	mg/L	1	2	<0.05	104		75 - 125	20
Dissolved Manganese		0.21	mg/L	1	0.20	<0.01	105		75 - 125	20
Dissolved Silver		0.20	mg/L	1	0.20	<0.01	100		75 - 125	20

Sample: LCSD QC Batch: QC04479

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		2.02	mg/L	1	2	<0.20	101	1	75 - 125	20
Dissolved Arsenic		0.99	mg/L	1	1	<0.05	99	1	75 - 125	20
Dissolved Barium		2.09	mg/L	1	2	<0.05	104	1	75 - 125	20
Dissolved Cadmium		0.20	mg/L	1	0.20	<0.01	100	0	75 - 125	20
Dissolved Chromium		0.42	mg/L	1	0.40	<0.01	105	2	75 - 125	20
Dissolved Iron		2.10	mg/L	1	2	<0.05	105	1	75 - 125	20
Dissolved Manganese		0.21	mg/L	1	0.20	<0.01	105	0	75 - 125	20
Dissolved Silver		0.20	mg/L	1	0.20	<0.01	100	0	75 - 125	20

Sample: LCS QC Batch: QC04514

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.098	mg/L	1	0.10	<0.001	98		80 - 120	20
Benzene		0.093	mg/L	1	0.10	<0.001	93		80 - 120	20
Toluene		0.093	mg/L	1	0.10	<0.001	93		80 - 120	20
Ethylbenzene		0.094	mg/L	1	0.10	<0.001	94		80 - 120	20
M,P,O-Xylene		0.276	mg/L	1	0.30	<0.001	92		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.082	mg/L	1	0.10	82	72 - 128
4-BFB		0.079	mg/L	1	0.10	79	72 - 128

Sample: LCSD QC Batch: QC04514

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.096	mg/L	1	0.10	<0.001	96	2	80 - 120	20
Benzene		0.09	mg/L	1	0.10	<0.001	90	3	80 - 120	20
Toluene		0.09	mg/L	1	0.10	<0.001	90	3	80 - 120	20
Ethylbenzene		0.09	mg/L	1	0.10	<0.001	90	4	80 - 120	20
M,P,O-Xylene		0.267	mg/L	1	0.30	<0.001	89	3	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.08	mg/L	1	0.10	80	72 - 128
4-BFB		0.077	mg/L	1	0.10	77	72 - 128

Sample: LCS

QC Batch: QC04663

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.095	mg/L	1	0.10	<0.001	95		80 - 120	20
Benzene		0.083	mg/L	1	0.10	<0.001	83		80 - 120	20
Toluene		0.081	mg/L	1	0.10	<0.001	81		80 - 120	20
Ethylbenzene		0.08	mg/L	1	0.10	<0.001	80		80 - 120	20
M,P,O-Xylene		0.272	mg/L	1	0.30	<0.001	90		80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.086	mg/L	1	0.10	86	72 - 128
4-BFB		0.078	mg/L	1	0.10	78	72 - 128

Sample: LCSD

QC Batch: QC04663

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.095	mg/L	1	0.10	<0.001	95	1	80 - 120	20
Benzene		0.084	mg/L	1	0.10	<0.001	84	1	80 - 120	20
Toluene		0.081	mg/L	1	0.10	<0.001	81	2	80 - 120	20
Ethylbenzene		0.081	mg/L	1	0.10	<0.001	81	4	80 - 120	20
M,P,O-Xylene		0.275	mg/L	1	0.30	<0.001	91	2	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.087	mg/L	1	0.10	87	72 - 128
4-BFB		0.079	mg/L	1	0.10	79	72 - 128

Sample: LCS QC Batch: QC04672

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.114	mg/L	1	0.10	<0.001	114	1	80 - 120	20
Benzene		0.112	mg/L	1	0.10	<0.001	112	1	80 - 120	20
Toluene		0.108	mg/L	1	0.10	<0.001	108	2	80 - 120	20
Ethylbenzene		0.106	mg/L	1	0.10	<0.001	106	4	80 - 120	20
M,P,O-Xylene		0.356	mg/L	1	0.30	<0.001	118	2	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.116	mg/L	1	0.10	116	72 - 128
4-BFB		0.107	mg/L	1	0.10	107	72 - 128

Sample: LCSD QC Batch: QC04672

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
MTBE		0.114	mg/L	1	0.10	<0.001	114	0	80 - 120	20
Benzene		0.113	mg/L	1	0.10	<0.001	113	1	80 - 120	20
Toluene		0.11	mg/L	1	0.10	<0.001	110	2	80 - 120	20
Ethylbenzene		0.108	mg/L	1	0.10	<0.001	108	2	80 - 120	20
M,P,O-Xylene		0.358	mg/L	1	0.30	<0.001	119	0	80 - 120	20

Surrogate	Flag	Result	Units	Dil.	Spike Amount	% Rec.	% Rec. Limit
TFT		0.118	mg/L	1	0.10	118	72 - 128
4-BFB		0.109	mg/L	1	0.10	109	72 - 128

Quality Control Report
Matrix Spikes and Duplicate Spikes

Sample: MS QC Batch: QC04404

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		730.91	mg/L	1	625	160	91		80 - 120	20
Sulfate		1187.00	mg/L	1	625	590	95		80 - 120	20

Sample: MSD QC Batch: QC04404

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		725.32	mg/L	1	625	160	90	1	80 - 120	20
Sulfate		1184.75	mg/L	1	625	590	95	0	80 - 120	20

Sample: MS QC Batch: QC04405

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		813.35	mg/L	1	625	240	91		80 - 120	20
Sulfate		983.17	mg/L	1	625	390	94		80 - 120	20

Sample: MSD QC Batch: QC04405

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
CL		811.39	mg/L	1	625	240	91	0	80 - 120	20
Sulfate		986.54	mg/L	1	625	390	95	0	80 - 120	20

Sample: MS QC Batch: QC04478

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		2.18	mg/L	1	2	<0.20	109		75 - 125	20
Dissolved Arsenic		1.02	mg/L	1	1	<0.05	102		75 - 125	20
Dissolved Barium		2.05	mg/L	1	2	0.07	99		75 - 125	20
Dissolved Cadmium		0.19	mg/L	1	0.20	<0.01	95		75 - 125	20
Dissolved Chromium		0.40	mg/L	1	0.40	<0.01	100		75 - 125	20
Dissolved Iron		2.01	mg/L	1	2	<0.05	100		75 - 125	20
Dissolved Manganese		0.20	mg/L	1	0.20	<0.01	100		75 - 125	20
Dissolved Silver		0.20	mg/L	1	0.20	<0.01	100		75 - 125	20

Sample: MSD QC Batch: QC04478

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		2.26	mg/L	1	2	<0.20	113	4	75 - 125	20
Dissolved Arsenic		1.05	mg/L	1	1	<0.05	105	3	75 - 125	20

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Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Barium		2.13	mg/L	1	2	0.07	103	4	75 - 125	20
Dissolved Cadmium		0.20	mg/L	1	0.20	<0.01	100	5	75 - 125	20
Dissolved Chromium		0.42	mg/L	1	0.40	<0.01	105	5	75 - 125	20
Dissolved Iron		2.11	mg/L	1	2	<0.05	105	5	75 - 125	20
Dissolved Manganese		0.21	mg/L	1	0.20	<0.01	105	5	75 - 125	20
Dissolved Silver		0.21	mg/L	1	0.20	<0.01	105	5	75 - 125	20

Sample: MS QC Batch: QC04479

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		1.96	mg/L	1	2	<0.20	98		75 - 125	20
Dissolved Arsenic		0.96	mg/L	1	1	<0.05	96		75 - 125	20
Dissolved Barium		2.08	mg/L	1	2	0.18	95		75 - 125	20
Dissolved Cadmium		0.19	mg/L	1	0.20	<0.01	95		75 - 125	20
Dissolved Chromium		0.39	mg/L	1	0.40	<0.01	97		75 - 125	20
Dissolved Iron		1.93	mg/L	1	2	<0.05	96		75 - 125	20
Dissolved Manganese		0.24	mg/L	1	0.20	0.05	95		75 - 125	20
Dissolved Silver		0.19	mg/L	1	0.20	<0.01	95		75 - 125	20

Sample: MSD QC Batch: QC04479

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Dissolved Aluminum		1.95	mg/L	1	2	<0.20	97	0	75 - 125	20
Dissolved Arsenic		0.97	mg/L	1	1	<0.05	97	1	75 - 125	20
Dissolved Barium		2.08	mg/L	1	2	0.18	95	0	75 - 125	20
Dissolved Cadmium		0.19	mg/L	1	0.20	<0.01	95	0	75 - 125	20
Dissolved Chromium		0.39	mg/L	1	0.40	<0.01	97	0	75 - 125	20
Dissolved Iron		1.93	mg/L	1	2	<0.05	96	0	75 - 125	20
Dissolved Manganese		0.24	mg/L	1	0.20	0.05	95	0	75 - 125	20
Dissolved Silver		0.19	mg/L	1	0.20	<0.01	95	0	75 - 125	20

Sample: MS QC Batch: QC04646

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
NO3-N		0.226	mg/L	1	0.16	<0.10	141		57 - 132	20

Sample: MSD QC Batch: QC04646

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
NO3-N		0.233	mg/L	1	0.16	<0.10	145	3	57 - 132	20

Sample: MS QC Batch: QC04647

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
NO3-N		0.172	mg/L	1	0.16	<0.10	107		57 - 132	20

Sample: MSD QC Batch: QC04647

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
NO3-N		0.152	mg/L	1	0.16	<0.10	95	12	57 - 132	20

Quality Control Report
Duplicate Samples

Sample: Duplicate QC Batch: QC04422

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		2764	2700	mg/L	1	2	20

Sample: Duplicate QC Batch: QC04443

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1590	1500	mg/L	1	6	20

Quality Control Report
Continuing Calibration Verification Standards

Sample: CCV (1) QC Batch: QC04404

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	11.70	93	80 - 120	8/22/00
Sulfate		mg/L	12.50	11.94	95	80 - 120	8/22/00

Sample: ICV (1) QC Batch: QC04404

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	11.74	93	80 - 120	8/22/00
Sulfate		mg/L	12.50	11.89	95	80 - 120	8/22/00

Sample: CCV (1) QC Batch: QC04405

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	11.66	93	80 - 120	8/22/00
Sulfate		mg/L	12.50	11.86	94	80 - 120	8/22/00

Sample: ICV (1) QC Batch: QC04405

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
CL		mg/L	12.50	11.70	93	80 - 120	8/22/00
Sulfate		mg/L	12.50	11.94	95	80 - 120	8/22/00

Sample: CCV (1) QC Batch: QC04422

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	970	97	80 - 120	8/23/00

Sample: ICV (1) QC Batch: QC04422

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	972	97	80 - 120	8/23/00

Sample: CCV (1)

QC Batch: QC04443

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	984	98	80 - 120	8/24/00

Sample: ICV (1)

QC Batch: QC04443

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	958	95	80 - 120	8/24/00

Sample: CCV (1)

QC Batch: QC04478

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Aluminum		mg/L	5	4.93	98	75 - 125	8/24/00
Dissolved Arsenic		mg/L	2.50	2.56	102	75 - 125	8/24/00
Dissolved Barium		mg/L	5	5.15	103	75 - 125	8/24/00
Dissolved Cadmium		mg/L	0.50	0.52	104	75 - 125	8/24/00
Dissolved Chromium		mg/L	1	1.03	103	75 - 125	8/24/00
Dissolved Iron		mg/L	5	5.16	103	75 - 125	8/24/00
Dissolved Manganese		mg/L	0.50	0.51	102	75 - 125	8/24/00
Dissolved Silver		mg/L	0.50	0.50	100	75 - 125	8/24/00

Sample: ICV (1)

QC Batch: QC04478

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Aluminum		mg/L	5	5.08	101	75 - 125	8/24/00
Dissolved Arsenic		mg/L	2.50	2.57	102	75 - 125	8/24/00
Dissolved Barium		mg/L	5	5.16	103	75 - 125	8/24/00
Dissolved Cadmium		mg/L	0.50	0.51	102	75 - 125	8/24/00
Dissolved Chromium		mg/L	1	1.02	102	75 - 125	8/24/00
Dissolved Iron		mg/L	5	5.17	103	75 - 125	8/24/00
Dissolved Manganese		mg/L	0.50	0.52	104	75 - 125	8/24/00

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Silver		mg/L	0.50	0.51	102	75 - 125	8/24/00

Sample: CCV (1)

QC Batch: QC04479

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Aluminum		mg/L	5	4.93	98	75 - 125	8/24/00
Dissolved Arsenic		mg/L	2.50	2.56	102	75 - 125	8/24/00
Dissolved Barium		mg/L	5	5.15	103	75 - 125	8/24/00
Dissolved Cadmium		mg/L	0.50	0.52	104	75 - 125	8/24/00
Dissolved Chromium		mg/L	1	1.03	103	75 - 125	8/24/00
Dissolved Iron		mg/L	5	5.16	103	75 - 125	8/24/00
Dissolved Manganese		mg/L	0.50	0.51	102	75 - 125	8/24/00
Dissolved Silver		mg/L	0.50	0.50	100	75 - 125	8/24/00

Sample: ICV (1)

QC Batch: QC04479

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Aluminum		mg/L	5	4.93	98	75 - 125	8/24/00
Dissolved Arsenic		mg/L	2.50	2.56	102	75 - 125	8/24/00
Dissolved Barium		mg/L	5	5.15	103	75 - 125	8/24/00
Dissolved Cadmium		mg/L	0.50	0.52	104	75 - 125	8/24/00
Dissolved Chromium		mg/L	1	1.03	103	75 - 125	8/24/00
Dissolved Iron		mg/L	5	5.16	103	75 - 125	8/24/00
Dissolved Manganese		mg/L	0.50	0.51	102	75 - 125	8/24/00
Dissolved Silver		mg/L	0.50	0.50	100	75 - 125	8/24/00

Sample: CCV (1)

QC Batch: QC04514

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.092	92	80 - 120	8/28/00
Toluene		mg/L	0.10	0.092	92	80 - 120	8/28/00
Ethylbenzene		mg/L	0.10	0.088	88	80 - 120	8/28/00
M,P,O-Xylene		mg/L	0.30	0.258	86	80 - 120	8/28/00

Sample: CCV (2)

QC Batch: QC04514

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.101	101	80 - 120	8/28/00
Toluene		mg/L	0.10	0.101	101	80 - 120	8/28/00
Ethylbenzene		mg/L	0.10	0.094	94	80 - 120	8/28/00
M,P,O-Xylene		mg/L	0.30	0.276	92	80 - 120	8/28/00

Sample: ICV (1) QC Batch: QC04514

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.091	91	80 - 120	8/28/00
Toluene		mg/L	0.10	0.092	92	80 - 120	8/28/00
Ethylbenzene		mg/L	0.10	0.099	99	80 - 120	8/28/00
M,P,O-Xylene		mg/L	0.30	0.295	98	80 - 120	8/28/00

Sample: CCV (1) QC Batch: QC04646

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-N		mg/L	0.16	0.175	109	80 - 120	8/29/00

Sample: ICV (1) QC Batch: QC04646

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-N		mg/L	0.16	0.168	105	80 - 120	8/29/00

Sample: CCV (1) QC Batch: QC04647

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-N		mg/L	0.16	0.172	107	80 - 120	8/29/00

Sample: ICV (1) QC Batch: QC04647

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-N		mg/L	0.16	0.175	109	80 - 120	8/29/00

Sample: CCV (1) QC Batch: QC04663

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.104	104	80 - 120	9/1/00
Toluene		mg/L	0.10	0.1	100	80 - 120	9/1/00
Ethylbenzene		mg/L	0.10	0.098	98	80 - 120	9/1/00
M,P,O-Xylene		mg/L	0.30	0.33	110	80 - 120	9/1/00

Sample: CCV (2) QC Batch: QC04663

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.113	113	80 - 120	9/1/00
Toluene		mg/L	0.10	0.108	108	80 - 120	9/1/00
Ethylbenzene		mg/L	0.10	0.107	107	80 - 120	9/1/00
M,P,O-Xylene		mg/L	0.30	0.358	119	80 - 120	9/1/00

Sample: ICV (1) QC Batch: QC04663

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.084	84	80 - 120	9/1/00
Toluene		mg/L	0.10	0.081	81	80 - 120	9/1/00
Ethylbenzene		mg/L	0.10	0.081	81	80 - 120	9/1/00
M,P,O-Xylene		mg/L	0.30	0.275	91	80 - 120	9/1/00

Sample: CCV (1) QC Batch: QC04672

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.12	120	80 - 120	9/1/00
Toluene		mg/L	0.10	0.115	115	80 - 120	9/1/00
Ethylbenzene		mg/L	0.10	0.113	113	80 - 120	9/1/00
M,P,O-Xylene		mg/L	0.30	0.354	118	80 - 120	9/1/00

Sample: CCV (2)

QC Batch: QC04672

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.107	107	80 - 120	9/1/00
Toluene		mg/L	0.10	0.1	100	80 - 120	9/1/00
Ethylbenzene		mg/L	0.10	0.102	102	80 - 120	9/1/00
M,P,O-Xylene		mg/L	0.30	0.336	112	80 - 120	9/1/00

Sample: ICV (1)

QC Batch: QC04672

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Benzene		mg/L	0.10	0.112	112	80 - 120	9/1/00
Toluene		mg/L	0.10	0.109	109	80 - 120	9/1/00
Ethylbenzene		mg/L	0.10	0.107	107	80 - 120	9/1/00
M,P,O-Xylene		mg/L	0.30	0.357	119	80 - 120	9/1/00

H00082201

TRW

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

№ 13515

Chain of Custody

Date 8-18-00 Page 1 of 2

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

Samplers (SIGNATURES)

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 Ag, Al, As, Ba, Cd, Cr, Fe & Mn	~~Total~~ Metals	Ions NH_3, SO_4, Cl, TDS	NO_3						Number of Containers
MW-7 151885	Water	8-17-00	1530	✓												✓		✓	✓						5
MW-3 86	Water	8-17-00	1705	✓												✓		✓	✓						5
MW-2 87	Water	8-17-00	1745	✓												✓		✓	✓						5
MW-1 88	Water	8-17-00	1820	✓												✓		✓	✓						5
MW-8 89	Water	8-18-00	0845	✓												✓		✓	✓						5
MW-12 90	Water	8-18-00	1050	✓												✓		✓	✓						5
MW-9 91	Water	8-18-00	1200	✓												✓		✓	✓						5
MW-11 92	Water	8-18-00	1120	✓												✓		✓	✓						5
MW-10 93	Water	8-18-00	1420	✓												✓		✓	✓						5
MW-10d 94	Water	8-18-00	1745	✓												✓		✓	✓						5

Project Information	
Project Name:	Duke Energy Field Services Inc.
Project Location:	Linam Ranch Plant
Project Manager:	Gil Van Deventer
Cost Center No.:	~~P/6494/2AC~~
Shipping ID No.:	
P O No.:	E2L14G0-702010 ←

Sample Receipt	
Total Containers:	
COC Seals:	
Rec'd Good Cond/Cold:	
Conforms to Records:	
Lab No.:	

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
(Signature) 7:55pm	(Signature) Helen Shelton 6:30AM	(Signature)
(Time)	(Time)	(Time)
(Printed Name) Gil Van Deventer	(Printed Name) HELEN SHELTON	(Printed Name)
(Date) 8-21-00	(Date) 8/21/00	(Date)
(Company) TRW Inc.	(Company) TRACE ANALYSIS	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Signature) Helen Shelton 3:55PM	(Signature)	(Signature) Vicki Hensley
(Time)	(Time)	(Time) 9:30A
(Printed Name) HELEN SHELTON	(Printed Name)	(Printed Name) Vicki Hensley
(Date) 8/21/00	(Date)	(Date) 8-22-00
(Company) TRACE ANALYSIS	(Company)	(Company) Trace Analysis

Special Instructions/Comments: Invoice direct to DEFS (Vicki Gunter)
Minimum detection limits (mg/l): Ag (0.01), Al (0.2), As (0.05), Ba (0.05), Cd (0.01), Cr (0.01), Fe (0.05), & Mn (0.01)

3° Dryfloor GLI-159-384-842-1 Shipped Greyhound / 50 samples – HS

Distribution: White, Canary-Laboratory / Pink-TRW

A000062201

TRW

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

№ 13516

Chain of Custody

Date _____ Page 2 of 2

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

Samplers (SIGNATURES)

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 Ag, Al, As, Ba	Total Metals Cd, Cr, Fe & Mn	Ions SO4, Cl, TDS	NO3						Number of Containers
MW-13 151895	Water	8-18-00	1120	✓												✓	✓	✓	✓						5
MW-5 96	Water	8-18-00	1550	✓												✓	✓	✓	✓						5
Duplicate 97	Water	8-18-00	0000	✓																					2
Rinsate 98	Water	8-18-00	1630	✓																					2
Trip BH 151932				✓																					

Project Information	Sample Receipt
Project Name: Duke Energy Field Services	Total Containers:
Project Location: Linam Ranch Plant	COC Seals:
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:
Cost Center No.: E2L14G0-702010	Conforms to Records:
Shipping ID No.:	Lab No.:
P O No.: E2L4G0-702010	
Special Instructions/Comments: See page 1	

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Gil Van Deventer 3:55pm	Helen Shelton 6:30pm	
(Signature) Gil Van Deventer (Time) 8-21-00	(Signature) HELEN SHELTON (Time) 8/21/00	(Signature) (Time)
(Printed Name) TRW Inc. (Date)	(Printed Name) TRACE ANALYSIS (Date)	(Printed Name) (Date)
(Company)	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
Helen Shelton 3:55PM		Vicki Hensley
(Signature) HELEN SHELTON (Time) 8/21/00	(Signature) (Time)	(Signature) Vicki Hensley (Time) 9:30A
(Printed Name) TRACE ANALYSIS (Date)	(Printed Name) (Date)	(Printed Name) Trace Analysis (Date) 8-22-00
(Company)	(Company)	(Company)

3° GL-159-381-842-1 Shipped Greyhound 1/1 ambient-IC

Distribution: White, Canary-Laboratory / Pink-TRW

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: November 9, 2000

Order ID Number: A00082201

Project Number: GPM Gas Co LLC
Project Name: E2L14G0-70210
Project Location: Linam Ranch Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
151888	MW-1	Water	8/18/00	18:20	8/22/00

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 3 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Analytical and Quality Control Report

Sample: 151888 - MW-1

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC04404 Date Analyzed: 8/22/00
Analyst: JS Preparation Method: N/A Prep Batch: PB03835 Date Prepared: 8/22/00

Param	Flag	Result	Units	Dilution	RDL
Nitrate-N		150	mg/L	1	0.20

Quality Control Report
Method Blank

Sample: Method Blank QCBatch: QC04404

Param	Flag	Results	Units	Reporting Limit
Nitrate-N		<0.2	mg/L	0.20

Quality Control Report
Matrix Spikes and Duplicate Spikes

Sample: MS QC Batch: QC04404

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N		380.84	mg/L	1	250	150	92		80 - 120	20

Sample: MSD QC Batch: QC04404

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
Nitrate-N		382.82	mg/L	1	250	150	93	1	80 - 120	20

Quality Control Report
Continuing Calibration Verification Standards

Sample: CCV (1)

QC Batch: QC04404

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	5	4.57	91	80 - 120	8/22/00

Sample: ICV (1)

QC Batch: QC04404

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Nitrate-N		mg/L	5	4.56	91	80 - 120	8/22/00

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
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E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

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

Report Date: November 13, 2000

Order ID Number: A00082201

Project Number: GPM Gas Co LLC
Project Name: E2L14G0-70210
Project Location: Linam Ranch Plant

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
151888	MW-1	Water	8/18/00	18:20	8/22/00

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.

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Dr. Blair Leftwich, Director

Analytical and Quality Control Report

Sample: 151888 - MW-1

Analysis:	NO3	Analytical Method:	SM 4500-NO3 E	QC Batch:	QC04646	Date Analyzed:	8/29/00
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB04050	Date Prepared:	8/29/00

Param	Flag	Result	Units	Dilution	RDL
NO3-NO2-N		150	mg/L	1	0.10

Quality Control Report
Method Blank

Sample: Method Blank

QCBatch: QC04646

Param	Flag	Results	Units	Reporting Limit
NO3-NO2-N		<0.10	mg/L	0.10

Quality Control Report
Matrix Spikes and Duplicate Spikes

Sample: MS

QC Batch: QC04646

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
NO3-NO2-N		0.226	mg/L	1	0.16	<0.10	141		57 - 132	20

Sample: MSD

QC Batch: QC04646

Param	Flag	Sample Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec.	RPD	% Rec. Limit	RPD Limit
NO3-NO2-N		0.233	mg/L	1	0.16	<0.10	145	3	57 - 132	20

Quality Control Report
Continuing Calibration Verification Standards

Sample: CCV (1)

QC Batch: QC04646

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-NO2-N		mg/L	0.16	0.175	109	80 - 120	8/29/00

Sample: ICV (1)

QC Batch: QC04646

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-NO2-N		mg/L	0.16	0.168	105	80 - 120	8/29/00

TRACEANALYSIS, INC.

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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: 3/1/00

Project Number: GPM Gas Co LLC
Project Name: E2L14G0-70210
Project Location: Linam Ranch Plant

Order ID Number: A00022407

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
141161	0002221040 MW-7	Water	2/22/00	10:40	2/24/00
141162	0002221130 MW-2	Water	2/22/00	11:30	2/24/00
141163	0002221215 MW-8	Water	2/22/00	12:15	2/24/00
141164	0002221515 MW-1	Water	2/22/00	15:15	2/24/00
141165	0002221555 MW-3	Water	2/22/00	15:55	2/24/00
141166	0002221700 MW-9	Water	2/22/00	17:00	2/24/00
141167	0002221810 MW-12	Water	2/22/00	18:10	2/24/00
141168	0002230745 MW-11	Water	2/23/00	7:45	2/24/00
141169	0002230900 MW-13	Water	2/23/00	9:00	2/24/00
141170	0002230930 Dup	Water	2/23/00	9:30	2/24/00
141171	0002231000 MW-10D	Water	2/23/00	10:00	2/24/00
141172	0002231020 MW-10	Water	2/23/00	10:20	2/24/00
141173	0002231030 Rinse	Water	2/23/00	10:30	2/24/00
141174	0002231115 MW-5	Water	2/23/00	11:15	2/24/00

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Dr. Blair Leftwich, Director

Analytical Results Report

Sample Number: 141161
Description: 0002221040 MW-7

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.419	1	0.1	84	72 - 128	RC	PB00940	QC01136
4-BFB	0.522	1	0.1	104	72 - 128	RC	PB00940	QC01136

Ion Chromatography (IC) (mg/L)									
Nitrate-N	* 6.0	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	96	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

* Nitrate-N - Sample ran out of holding time for NO3.

Sample Number: 141162
Description: 0002221130 MW-2

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.442	1	0.1	88	72 - 128	RC	PB00940	QC01136
4-BFB	0.518	1	0.1	104	72 - 128	RC	PB00940	QC01136

Ion Chromatography (IC) (mg/L)									
Nitrate-N	* 2.8	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01141	0.2
Sulfate	17	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01141	0.5

* Nitrate-N - Sample ran out of holding time for NO3.

Sample Number: 141163
Description: 0002221215 MW-8

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #	
TFT	0.439	1	0.1	88	72 - 128	RC	PB00940	QC01136	
4-BFB	0.52	1	0.1	104	72 - 128	RC	PB00940	QC01136	
Ion Chromatography (IC) (mg/L)									
Nitrate-N	* 3.4	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01141	0.2
Sulfate	22	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01141	0.5

* Nitrate-N - Sample ran out of holding time for NO3.

Sample Number: 141164
Description: 0002221515 MW-1

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	0.006	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.006	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #	
TFT	0.402	1	0.1	80	72 - 128	RC	PB00940	QC01136	
4-BFB	0.514	1	0.1	103	72 - 128	RC	PB00940	QC01136	
Ion Chromatography (IC) (mg/L)									
Nitrate-N	* 130	1	E 300.0	2/28/00	2/28/00	JS	PB00985	QC01193	0.2
Sulfate	570	1	E 300.0	2/28/00	2/28/00	JS	PB00985	QC01193	0.5

* Nitrate-N - Sample re-ran out of hold time for NO3.

Sample Number: 141165
Description: 0002221555 MW-3

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #	
TFT	0.092	1	0.1	92	72 - 128	RC	PB00940	QC01136	
4-BFB	0.108	1	0.1	108	72 - 128	RC	PB00940	QC01136	
Ion Chromatography (IC) (mg/L)									
Nitrate-N	4.0	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	33	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Sample Number: 141166
Description: 0002221700 MW-9

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.014	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Toluene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.014	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.364	1	0.1	73	72 - 128	RC	PB00940	QC01136
4-BFB	0.411	1	0.1	82	72 - 128	RC	PB00940	QC01136

Ion Chromatography (IC) (mg/L)									
Nitrate-N	4.5	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	75	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Sample Number: 141167
Description: 0002221810 MW-12

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.116	1	0.1	116	72 - 128	RC	PB00940	QC01136
4-BFB	0.122	1	0.1	122	72 - 128	RC	PB00940	QC01136

Ion Chromatography (IC) (mg/L)									
Nitrate-N	3.1	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	73	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Sample Number: 141168
Description: 0002230745 MW-11

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.02	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	0.002	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	0.008	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.03	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.091	1	0.1	91	72 - 128	RC	PB00940	QC01136
4-BFB	0.116	1	0.1	116	72 - 128	RC	PB00940	QC01136

Ion Chromatography (IC) (mg/L)									
Nitrate-N	7.0	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	120	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Sample Number: 141169
Description: 0002230900 MW-13

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.08	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.08	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.083	1	0.1	83	72 - 128	RC	PB00940	QC01136
4-BFB	0.105	1	0.1	105	72 - 128	RC	PB00940	QC01136

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Ion Chromatography (IC) (mg/L)									
Nitrate-N	9.1	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	86	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Sample Number: 141170
Description: 0002230930 Dup

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.09	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.09	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.077	1	0.1	77	72 - 128	RC	PB00940	QC01136
4-BFB	0.097	1	0.1	97	72 - 128	RC	PB00940	QC01136

Sample Number: 141171
Description: 0002231000 MW-10D

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.004	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.005	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.099	1	0.1	99	72 - 128	RC	PB00940	QC01136
4-BFB	0.112	1	0.1	112	72 - 128	RC	PB00940	QC01136

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Ion Chromatography (IC) (mg/L)									
Nitrate-N	2.7	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	220	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Sample Number: 141172
Description: 0002231020 MW-10

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	2.35	10	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	0.129	10	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	0.164	10	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	0.124	10	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	2.77	10	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.835	1	0.1	84	72 - 128	RC	PB00940	QC01136
4-BFB	1.08	1	0.1	108	72 - 128	RC	PB00940	QC01136

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Ion Chromatography (IC) (mg/L)									
Nitrate-N	<1.0	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	180	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Sample Number: 141173
Description: 0002231030 Rinse

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.002	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	<0.001	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.002	1	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.095	1	0.1	95	72 - 128	RC	PB00940	QC01136
4-BFB	0.116	1	0.1	116	72 - 128	RC	PB00940	QC01136

Sample Number: 141174
Description: 0002231115 MW-5

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
BTEX (mg/L)									
Benzene	0.068	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Toluene	<0.005	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Ethylbenzene	0.13	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
M,P,O-Xylene	0.09	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001
Total BTEX	0.288	5	S 8021B	2/25/00	2/25/00	RC	PB00940	QC01136	0.001

Surrogate (mg/L)	Result	Dilution	Spike Amount	% Rec.	% Rec. Limit	Analyst	Prep Batch #	QC Batch #
TFT	0.384	1	0.1	77	72 - 128	RC	PB00940	QC01136
4-BFB	0.536	1	0.1	107	72 - 128	RC	PB00940	QC01136

Param	Result	Dilution	Analytical Method	Date Prepared	Date Analyzed	Analyst	Prep Batch #	QC Batch #	RDL
Ion Chromatography (IC) (mg/L)									
Nitrate-N	<1.0	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.2
Sulfate	64	1	E 300.0	2/24/00	2/24/00	JS	PB00943	QC01140	0.5

Quality Control Report
Method Blanks

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Benzene (mg/L)		<0.001	0.001	2/25/00	PB00940	QC01136
Toluene (mg/L)		<0.001	0.001	2/25/00	PB00940	QC01136
Ethylbenzene (mg/L)		<0.001	0.001	2/25/00	PB00940	QC01136
M,P,O-Xylene (mg/L)		<0.001	0.001	2/25/00	PB00940	QC01136

Surrogate	Result	Spike Amount	% Rec.	% Rec. Limit	QC Batch #
TFT (mg/L)	0.076	0.1	76	72 - 128	QC01136
4-BFB (mg/L)	0.088	0.1	88	72 - 128	QC01136

Param	Flag	Blank Result	Reporting Limit	Date Analyzed	Prep Batch #	QC Batch #
Nitrate-N (mg/L)		<0.2	0.2	2/24/00	PB00943	QC01140
Sulfate (mg/L)		<0.5	0.5	2/24/00	PB00943	QC01140
Nitrate-N (mg/L)		<0.2	0.2	2/24/00	PB00943	QC01141
Sulfate (mg/L)		<0.5	0.5	2/24/00	PB00943	QC01141
Nitrate-N (mg/L)		<0.2	0.2	2/28/00	PB00985	QC01193
Sulfate (mg/L)		<0.5	0.5	2/28/00	PB00985	QC01193

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	Nitrate-N (mg/L)	6.0	1	25	28.76	91		80 - 120	0 - 20	QC01140
MS	Sulfate (mg/L)	96	1	62.5	156.93	97		80 - 120	0 - 20	QC01140
MSD	Nitrate-N (mg/L)	6.0	1	25	28.46	90	1	80 - 120	0 - 20	QC01140
MSD	Sulfate (mg/L)	96	1	62.5	157.65	99	1	80 - 120	0 - 20	QC01140

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	Nitrate-N (mg/L)	17	1	25	39.87	91		80 - 120	0 - 20	QC01141
MS	Sulfate (mg/L)	170	1	62.5	228.02	93		80 - 120	0 - 20	QC01141
MSD	Nitrate-N (mg/L)	17	1	25	40.09	92	1	80 - 120	0 - 20	QC01141
MSD	Sulfate (mg/L)	170	1	62.5	230.08	96	3	80 - 120	0 - 20	QC01141

Standard	Param	Sample Result	Dil.	Spike Amount Added	Matrix Spike Result	% Rec.	RPD	% Rec. Limit	RPD Limit	QC Batch #
MS	Nitrate-N (mg/L)	23	1	25	46.80	95		80 - 120	0 - 20	QC01193
MS	Sulfate (mg/L)	170	1	62.5	232.36	100		80 - 120	0 - 20	QC01193
MSD	Nitrate-N (mg/L)	23	1	25	46.61	94	1	80 - 120	0 - 20	QC01193
MSD	Sulfate (mg/L)	170	1	62.5	230.73	97	3	80 - 120	0 - 20	QC01193

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	0.099	99		80 - 120	0 - 20	QC01136
LCS	Benzene (mg/L)	<0.001	1	0.1	0.094	94		80 - 120	0 - 20	QC01136
LCS	Toluene (mg/L)	<0.001	1	0.1	0.093	93		80 - 120	0 - 20	QC01136
LCS	Ethylbenzene (mg/L)	<0.001	1	0.1	0.094	94		80 - 120	0 - 20	QC01136
LCS	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.281	94		80 - 120	0 - 20	QC01136

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCS	TFT (mg/L)	1	0.1	0.074	74	72 - 128	QC01136
LCS	4-BFB (mg/L)	1	0.1	0.095	95	72 - 128	QC01136

LCSD	MTBE (mg/L)	<0.001	1	0.1	0.088	88	12	80 - 120	0 - 20	QC01136
LCSD	Benzene (mg/L)	<0.001	1	0.1	0.085	85	10	80 - 120	0 - 20	QC01136
LCSD	Toluene (mg/L)	<0.001	1	0.1	0.085	85	9	80 - 120	0 - 20	QC01136
LCSD	Ethylbenzene (mg/L)	<0.001	1	0.1	0.087	87	8	80 - 120	0 - 20	QC01136
LCSD	M,P,O-Xylene (mg/L)	<0.001	1	0.3	0.26	87	8	80 - 120	0 - 20	QC01136

Standard	Surrogate	Dil.	Spike Amount	Result	% Rec.	% Rec. Limit	QC Batch #
LCSD	TFT (mg/L)	1	0.1	0.082	82	72 - 128	QC01136
LCSD	4-BFB (mg/L)	1	0.1	0.105	105	72 - 128	QC01136

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	2/25/00	QC01136
ICV	Toluene (mg/L)		0.1	0.093	93	80 - 120	2/25/00	QC01136
ICV	Ethylbenzene (mg/L)		0.1	0.093	93	80 - 120	2/25/00	QC01136
ICV	M,P,O-Xylene (mg/L)		0.3	0.278	93	80 - 120	2/25/00	QC01136
CCV 1	Benzene (mg/L)		0.1	0.097	97	80 - 120	2/25/00	QC01136
CCV 1	Toluene (mg/L)		0.1	0.097	97	80 - 120	2/25/00	QC01136
CCV 1	Ethylbenzene (mg/L)		0.1	0.096	96	80 - 120	2/25/00	QC01136
CCV 1	M,P,O-Xylene (mg/L)		0.3	0.288	96	80 - 120	2/25/00	QC01136
CCV 2	Benzene (mg/L)		0.1	0.09	90	80 - 120	2/25/00	QC01136
CCV 2	Toluene (mg/L)		0.1	0.089	89	80 - 120	2/25/00	QC01136
CCV 2	Ethylbenzene (mg/L)		0.1	0.088	88	80 - 120	2/25/00	QC01136
CCV 2	M,P,O-Xylene (mg/L)		0.3	0.264	88	80 - 120	2/25/00	QC01136

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Nitrate-N (mg/L)		5	4.61	92	80 - 120	2/24/00	QC01140
ICV	Sulfate (mg/L)		12.5	11.93	95	80 - 120	2/24/00	QC01140
CCV 1	Nitrate-N (mg/L)		5	4.59	92	80 - 120	2/24/00	QC01140
CCV 1	Sulfate (mg/L)		12.5	12.00	96	80 - 120	2/24/00	QC01140

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Nitrate-N (mg/L)		5	4.59	92	80 - 120	2/24/00	QC01141
ICV	Sulfate (mg/L)		12.5	12.00	96	80 - 120	2/24/00	QC01141
CCV 1	Nitrate-N (mg/L)		5	4.67	93	80 - 120	2/24/00	QC01141
CCV 1	Sulfate (mg/L)		12.5	12.07	97	80 - 120	2/24/00	QC01141

Standard	Param	Flag	CCVs TRUE Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed	QC Batch #
ICV	Nitrate-N (mg/L)		5	4.73	95	80 - 120	2/28/00	QC01193
ICV	Sulfate (mg/L)		12.5	11.95	96	80 - 120	2/28/00	QC01193
CCV 1	Nitrate-N (mg/L)		5	4.76	95	80 - 120	2/28/00	QC01193
CCV 1	Sulfate (mg/L)		12.5	12.08	97	80 - 120	2/28/00	QC01193

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

№ 13485

Chain of Custody

Date 2-23-00 Page 1 of 2

Lab Name: Trace Analysis Inc
Address: 6701 Aberdeen Ave, Ste 9
Lubbock, Tx 79424
Telephone: 800/378-1296

Samplers (SIGNATURES): Dale T Littlejohn

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	TCLP Metals	NO_3 & SO_4							Number of Containers
*	0002221040 (MW-7)	Water	2/22/00	1040	✓					14	11	61							✓							4
*	0002221130 (MW-2)	"	"	1130	✓							62							✓							4
	0002221215 (MW-8)	"	"	1215	✓							63							✓							4
*	0002221515 (MW-1)	"	"	1515	✓							64							✓							4
	0002221555 (MW-3)	"	"	1555	✓							65							✓							4
	0002221700 (MW-9)	"	"	1700	✓							66							✓							4
	0002221810 (MW-12)	"	"	1810	✓							67							✓							4
	0002230745 (MW-11)	"	2/23/00	0745	✓							68							✓							4
	0002230900 (MW-13)	"	"	0900	✓							69							✓							4
	0002230930 (Dup)	"	"	0930	✓							70							✓							2

Project Information		Sample Receipt	
Project Name:	GPM Gas Co-LLC	Total Containers:	
Project Location:	Linam Ranch Plant	COC Seals:	
Project Manager:	Gil Van Deventer	Rec'd Good Cond/Cold:	✓
* Cost Center No.:	E2L14G0-702010	Conforms to Records:	
Shipping ID No.:		Lab No.:	
P O No.:			

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Dale T Littlejohn 1200		
(Signature) (Time) Dale T. Littlejohn 2/23	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date) TRW	(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
		Vicki Windham 9:30am
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date) Vicki Windham 2-23-00
(Company)	(Company)	(Company) Trace Analysis

Special Instructions/Comments: Bill direct to GPM-NM Region
Attn: Mel Driver
P.O. Box 50020
Midland, Tx 79710

* Add mint in vials

Distribution: White, Canary-Laboratory / Pink-TRW

TNLAO 902-369-1891 X ext

21.

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

№ 13486

Chain of Custody

Date 2/23/00 Page 2 of 2

Lab Name: Trace Analysis Inc
Address: 6701 Aberdeen Ave, Ste 9
Lubbock, Tx 79424
Telephone: 800/378-1296

Samplers (SIGNATURES): Dale Littlejohn

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	TCLP Metals	NO_3 & SO_4						Number of Containers
0002231000 (MW-10-D)	Water	2/23/00	1000	✓						14	17	1						✓						4
0002231020 (MW-10)	"	"	1020	✓							7	2						✓						4
0002231030 (Rinse)	"	"	1030	✓							7	3												2
0002231115 (MW-5)	"	"	1115	✓							7	4						✓						4

Project Information	Sample Receipt	
Project Name: GPM Gas Co., LLC	Total Containers:	
Project Location: Linam Ranch Plant	COC Seals:	
Project Manager: Gil Van Deventer	Rec'd Good Cond/Cold:	✓
Cost Center No.: E2L14G0-~~70210~~ 702010	Conforms to Records:	
Shipping ID No.:	Lab No.:	
P O No.:		

Special Instructions/Comments: Bill direct to GPM-NM Region Attn: Mel Driver P.O. Box 50020 Midland, Tx 79710

Relinquished By: (1)	Relinquished By: (2)	Relinquished By: (3)
Dale Littlejohn 1200		
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Dale T. Littlejohn 2/23		
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
TRW		
(Company)	(Company)	(Company)
Received By: (1)	**Received By: (2)**	**Received By: (3)**
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
		Vicki Windham 9:30a
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
		Vicki Windham 2-24-00
(Company)	(Company)	(Company)
		Trace Analysis

Distribution: White, Canary-Laboratory / Pink-TRW

TRW Info - 902-369-189-1

and

1998 Annual Groundwater Monitoring and Sampling Report
GPM – Linam Ranch Natural Gas Plant
Lea County, New Mexico

OCTOBER 14, 1998

Prepared For:

GPM Gas Corporation
4044 Penbrook
Odessa, Texas 79762

Prepared By:

TRW

Energy & Environmental Systems
415 West Wall, Suite 1818
Midland, Texas 79701

1998 Annual Groundwater Monitoring and Sampling Report
GPM - Linam Ranch Gas Plant
Lea County, New Mexico

Prepared by:

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

SUBMITTED BY: DATE:

Gilbert J. Van Deventer, REM
Project Manager

11/24/98

REVIEWED BY: DATE:

Dale T. Littlejohn
Quality Assurance Officer

11/30/98

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APPENDICES

1.0 Executive Summary

BDM International, Inc., a wholly owned subsidiary of TRW Inc. (TRW) was retained by GPM Gas Corporation (GPM) to perform the sampling and monitoring operations at the Linam Ranch Plant. This 1998 annual report documents the two semi-annual sampling events performed by TRW at the GPM Linam Ranch Plant on January 22, 1998 and July 22, 1998. 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 February 15, 1997 and March 25, 1998.

Based on the sampling and monitoring data to date, the following conclusions relevant to groundwater conditions at the Linam Ranch Plant are evident:

- BTEX concentrations in monitoring wells MW-9 and MW-12 have remained well below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.
- Benzene concentrations in MW-10, MW-10D, MW-11, and MW-13 were 7.18 mg/L, 0.184 mg/L, 0.061 mg/L, and 0.061 mg/L, respectively, which exceed the WQCC standard of 0.010 mg/L.
- Benzene concentrations in MW-10 have remained relatively stable; however, both 1998 sampling events indicated increased benzene concentrations of 7.03 mg/L and 7.18 mg/L respectively.
- Benzene concentrations in MW-10D fluctuate over time but have declined from a high of 8.140 mg/L on the April 24, 1996, to a concentration of 0.184 mg/L on July 22, 1998.
- Benzene concentrations in MW-11 fluctuate over time but have declined from a high of 0.549 mg/L on the January 17, 1996, to a low of 0.061 mg/L on July 22, 1998.
- Benzene concentrations in MW-13 had increased from less than 0.001 mg/L, during the April 24, 1996 sampling event, to a high of 0.132 mg/L during the August 15, 1997 sampling event; however benzene concentrations have decreased to 0.082 mg/L and 0.061 mg/L during the January and July 1998 sampling events, respectively.
- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.
- The dissolved-phase hydrocarbons in groundwater are contained well within the boundaries of the facility.
- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards, increased levels of these constituents indicate intrinsic bioremediation processes are active.

The following actions are recommended to monitor the groundwater conditions at the Linam Ranch Plant.

- The sampling and monitoring program should continue on a semi-annual basis. The next sampling event is scheduled during the first quarter of 1999.

- Benzene concentrations in downgradient well MW-13 will be monitored closely prior to initiating additional corrective action. It is expected that the benzene concentrations in MW-13 will continue decreasing and return to levels below the WQCC standards during subsequent sampling events.

2.0 Chronology of Events

February 7, 1994	Geoscience Consultants Ltd (GCL) was retained by ENRON Operations Corporation (ENRON) to address groundwater quality conditions at the Hobbs Gas Plant which was scheduled for acquisition by GPM. As part of a subsurface investigation for two areas within the plant, GCL completed temporary drive point wells DP-1 and DP-2 downgradient and upgradient, respectively, of the EOTT tanks, and one monitoring well, MW-8, downgradient of the former liquid waste disposal area. Hydrocarbon-impacted groundwater was identified in DP-1.
May 18-22, 1994	Daniel B. Stevens and Associates (DBS&A) completed seven temporary drive point wells (EOTT-1 through EOTT-7) to delineate the horizontal extent of hydrocarbon-impacted soils and groundwater in the EOTT tank area. Drive point well EOTT-6 was converted into monitoring well MW-9. Hydrocarbon-impacted groundwater was identified east of the EOTT tanks.
October 7, 1994	The OCD requested ENRON to provide a work plan to completely define the extent of groundwater contamination at the Hobbs Gas Plant.
November 1994	GPM Gas Corporation (GPM) acquired ownership and operation of the Linam Ranch Plant (formerly Hobbs Gas Plant) from ENRON.
February 23, 1995	GPM submitted a subsurface investigation work plan to the OCD to address the groundwater conditions at Linam Ranch Plant.
April 5, 1995	The OCD approved the subsurface investigation work plan.
May 10-13, 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 five monitoring wells (MW-10D, MW-10, MW-11, MW-12, and MW-13) and two soils borings (SB-1 and SB-2).
September 18, 1995	GPM submitted the *Subsurface Investigation and Preliminary Remedial Response* report for the Linam Ranch Plant to the OCD.
October 19, 1995	The OCD approved GPM's recommendations for remedial action, which included a quarterly sampling and monitoring program.
November 14, 1995	GCL conducted the fourth quarter 1995 sampling event at Linam Ranch Plant.

January 17, 1996	GCL conducted the first quarter 1996 sampling event at Linam Ranch Plant.
April 24, 1996	GCL conducted the annual (second quarter 1996) sampling event at Linam Ranch Plant. The annual report included recommendations to the OCD for continued monitoring on a semi-annual basis.
January 22, 1997	BDM International, Inc. (formerly GCL) conducted the semi-annual (first quarter 1997) sampling event.
August 15, 1997	BDM International, Inc. (BDM) conducted the annual (third quarter 1997) sampling event.
January 22, 1998	BDM, a wholly owned subsidiary of TRW, conducted the semi-annual (first quarter 1998) sampling event.
July 22, 1998	TRW conducted the annual (third quarter 1998) sampling event.

3.0 Procedures

Prior to sampling, the on-site monitoring wells (MW-9 through MW-13) were gauged for depth to groundwater using a Heron Model H.01L electronic water/product interface probe. Immediately prior to collecting groundwater samples, a minimum of three well volumes was purged from each monitoring well. Each monitoring well was purged using a decontaminated 2-inch diameter submersible pump (Grundfos Redi-Flo2), with the exception of monitoring wells MW-9 and MW-10d during the January 22, 1998 sampling event. During the January 1998 sampling event, MW-9 and MW-10d were purged by hand using a decontaminated PVC bailer. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen (DO) were measured during and after purging using a Hydac Model 910 pH/conductivity meter, a YSI Model 51B DO meter (January 22, 1998), and a Hanna DO meter (July 22, 1998). Groundwater samples were collected after these parameters stabilized. A total of 354 gallons of water was purged from monitoring wells MW-9 through MW-13 during the January 22, 1998 and July 22, 1998 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 benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021B. A duplicate sample was collected from MW-11, during the first sampling event, and from MW-12 during the second sampling event. 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 second annual sampling event on July 22, 1998, a third and fourth set of water samples were transferred into appropriately preserved containers for analysis of chlorides and total dissolved solids (TDS) and WQCC metals (aluminum, chromium, iron, manganese, and silver). Samples for metals analysis were filtered with a 45mm element on July 22, 1998; therefore results indicate total dissolved metals. 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-9	1/22/98	Bailer	5	Disposable bailer	BTEX and Bio-indicators
	7/20/98	Pump	20	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10	1/22/98	Pump	30	Disposable bailer	BTEX and Bio-indicators
	7/22/98	Pump	50	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10D	1/22/98	Bailer	14	Disposable bailer	BTEX and Bio-indicators
	7/22/98	Pump	20	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-11	1/22/98	Pump	30	Disposable bailer	BTEX and Bio-indicators
	7/22/98	Pump	50	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-12	1/22/98	Pump	30	Disposable bailer	BTEX and Bio-indicators
	7/22/98	Pump	50	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-13	1/22/98	Pump	30	Disposable bailer	BTEX and Bio-indicators
	7/20/98	Pump	25	Disposable bailer	BTEX, Metals, Ions, Bio-indicators

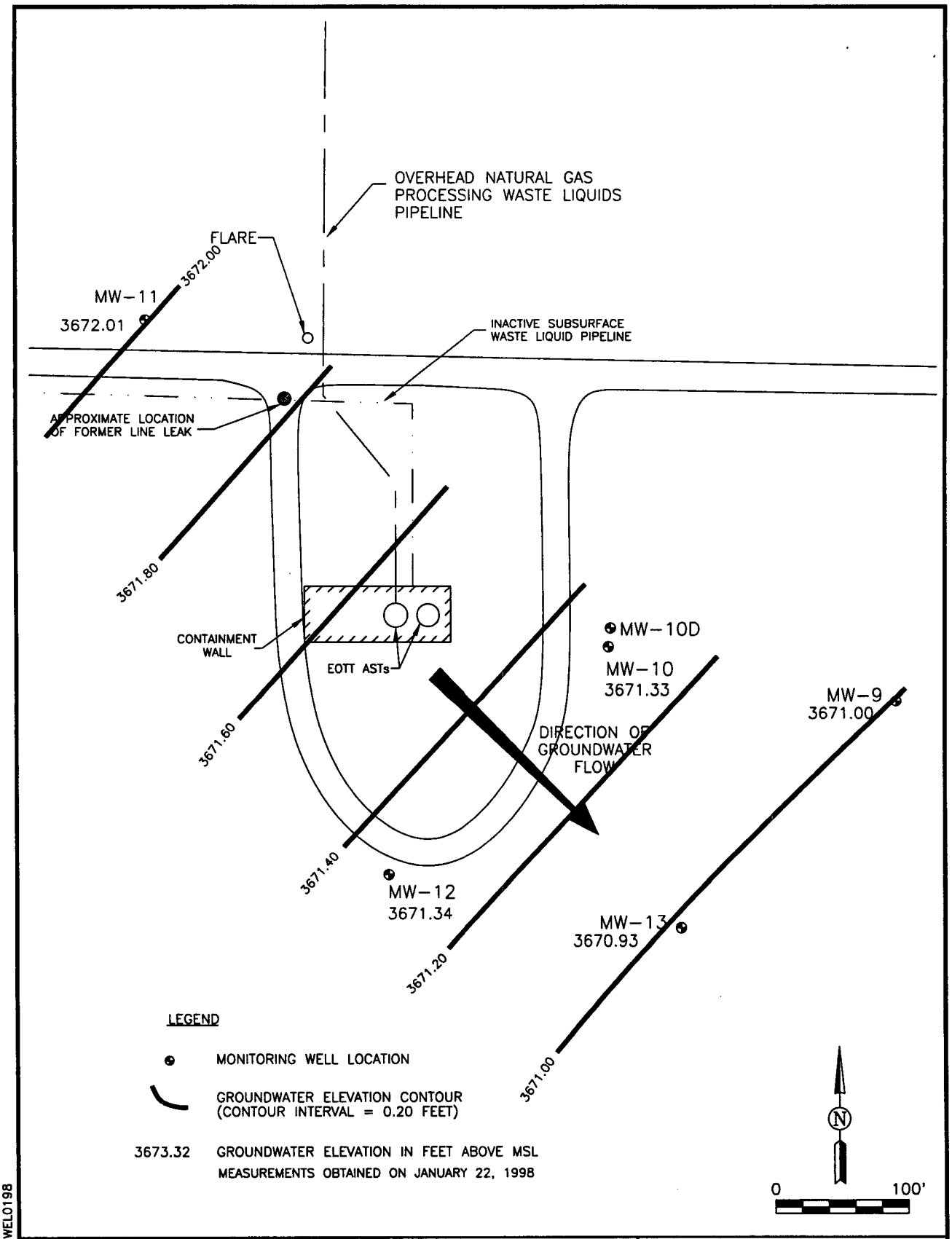
BTEX - benzene, toluene, ethylbenzene, xylenes
WQCC Metals - Ag, Al, Cr, Fe, and Mn
Major ions - TDS, Cl, NO_3, and SO_4
Bio-indicators - DO, NO_3, SO_4

4.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by TRW on July 20, 1998, the groundwater conditions at the Linam Ranch Plant are characterized below.

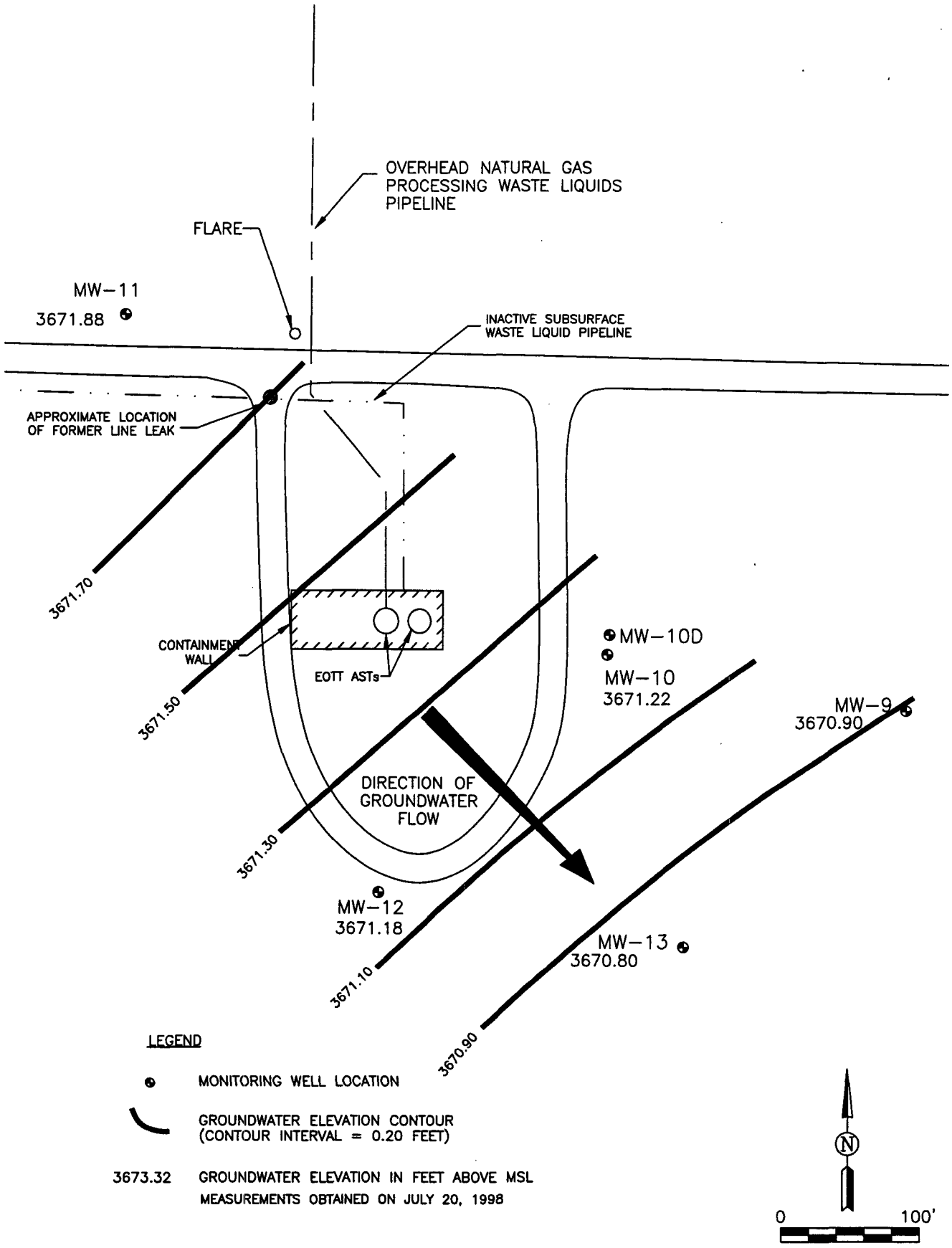
- The depth to the water table is approximately 49.5 feet below ground surface in the site area.
- The hydraulic gradient is approximately 0.002 feet/foot.
- The direction of groundwater flow is to the southeast.
- The water table elevation has continued to decline and is approximately 1.9 feet lower than in January 1996.

The direction of groundwater flow and hydraulic gradient has remained consistent for the past two 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 1998 sampling events are presented in Figure 1a (January 22, 1998) and Figure 1b (July 20, 1998). Figure 2 depicts the changes in groundwater elevations with time. Historical groundwater elevations and depth to water measurements are summarized in Table 2.



BDM	CLIENT: GPM GAS CORPORATION	**FIGURE 1a LINAM RANCH PLANT GROUNDWATER ELEVATION MAP**
	DATE: 01/22/98 / REV. NO.:	
	AUTHOR: GJV / DRN BY: DAG	
	CK'D BY: MWS / FILE: GWEL0198	

D:\P2398\21\GWEL0198



D:\P2398\21\GWEL0798

BDM

CLIENT: GPM GAS CORPORATION	
DATE: 07/20/98	REV. NO.:
AUTHOR: GJV	DRN BY: DAG
CK'D BY: MWS	FILE: GWEL0798

FIGURE 1b
LINAM RANCH PLANT
GROUNDWATER ELEVATION MAP

FIGURE 2

GROUNDWATER ELEVATION VS. TIME

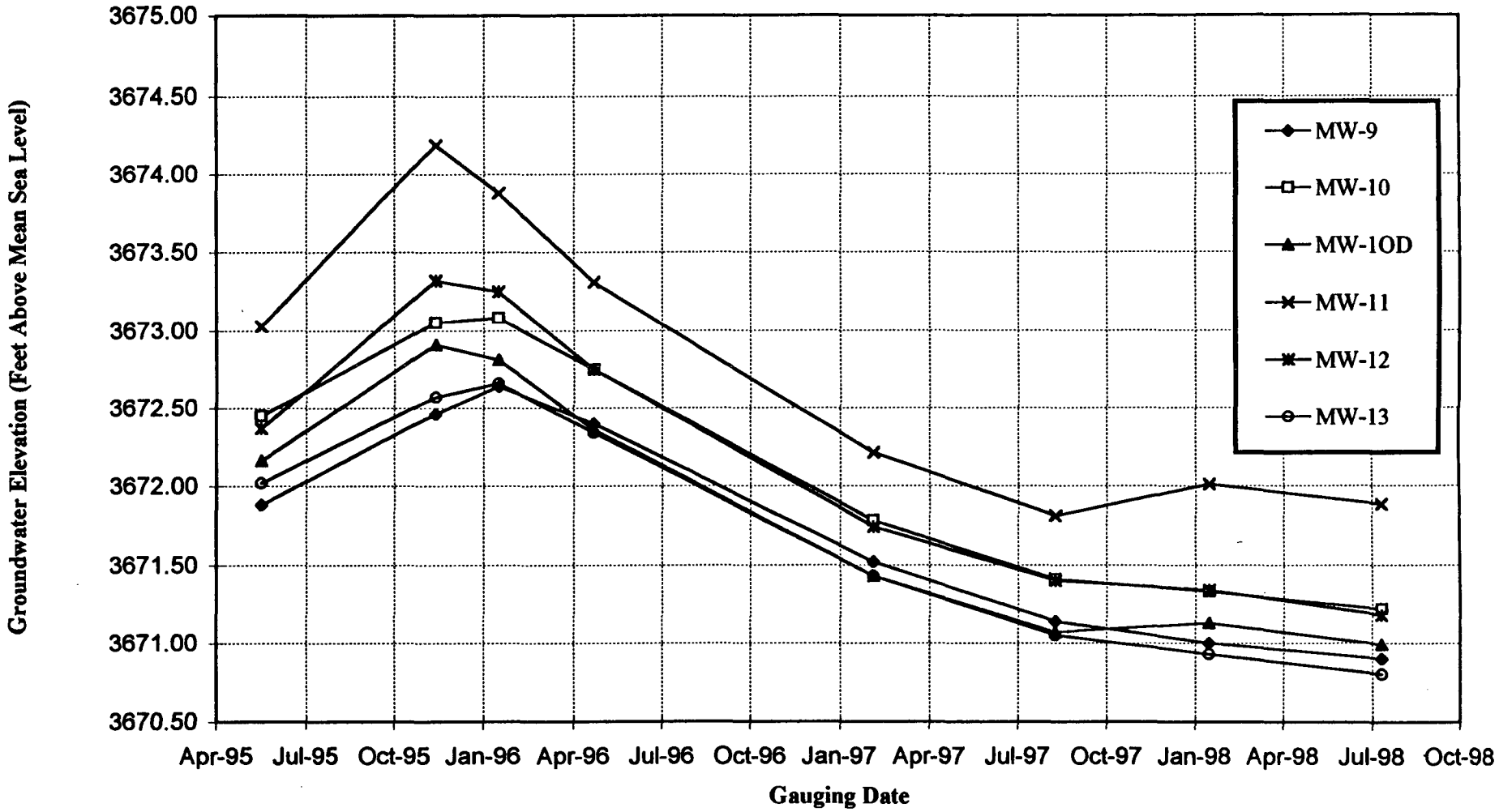


Table 2
Summary of Groundwater Elevations
Linam Ranch Plant - EOTT Tanks

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-9	5/17/95	3720.48	3722.48	50.60	3671.88	0.00
	11/14/95	3720.48	3722.48	50.02	3672.46	0.00
	1/17/96	3720.48	3722.48	49.84	3672.64	0.00
	4/24/96	3720.48	3722.48	50.08	3672.40	0.00
	2/7/97	3720.48	3722.48	50.96	3671.52	0.00
	8/15/97	3720.48	3722.48	51.34	3671.14	0.00
	1/22/98	3720.48	3722.48	51.48	3671.00	0.00
	7/20/98	3720.48	3722.48	51.58	3670.90	0.00
MW-10	5/17/95	3720.76	3722.90	50.45	3672.45	0.00
	11/14/95	3720.76	3722.90	49.85	3673.05	0.00
	1/17/96	3720.76	3722.90	49.82	3673.08	0.00
	4/24/96	3720.76	3722.90	50.15	3672.75	0.00
	2/7/97	3720.76	3722.90	51.12	3671.78	0.00
	8/15/97	3720.76	3722.90	51.49	3671.41	0.00
	1/22/98	3720.76	3722.90	51.57	3671.33	0.00
	7/20/98	3720.76	3722.90	51.68	3671.22	0.00
MW-10D	5/17/95	3720.85	3723.54	51.38	3672.16	0.00
	11/14/95	3720.85	3723.54	50.63	3672.91	0.00
	1/17/96	3720.85	3723.54	50.73	3672.81	0.00
	4/24/96	3720.85	3723.54	51.18	3672.36	0.00
	2/7/97	3720.85	3723.54	52.11	3671.43	0.00
	8/15/97	3720.85	3723.54	52.47	3671.07	0.00
	1/22/98	3720.85	3723.54	52.41	3671.13	0.00
	7/20/98	3720.85	3723.54	52.55	3670.99	0.00
MW-11	5/17/95	3722.02	3724.53	51.50	3673.03	0.00
	11/14/95	3722.02	3724.53	50.34	3674.19	0.00
	1/17/96	3722.02	3724.53	50.65	3673.88	0.00
	4/24/96	3722.02	3724.53	51.22	3673.31	0.00
	2/7/97	3722.02	3724.53	52.32	3672.21	0.00
	8/15/97	3722.02	3724.53	52.72	3671.81	0.00
	1/22/98	3722.02	3724.53	52.52	3672.01	0.00
	7/20/98	3722.02	3724.53	52.65	3671.88	0.00
MW-12	5/17/95	3720.60	3722.84	50.47	3672.37	0.00
	11/14/95	3720.60	3722.84	49.52	3673.32	0.00
	1/17/96	3720.60	3722.84	49.59	3673.25	0.00
	4/24/96	3720.60	3722.84	50.09	3672.75	0.00
	2/7/97	3720.60	3722.84	51.10	3671.74	0.00
	8/15/97	3720.60	3722.84	51.44	3671.40	0.00
	1/22/98	3720.60	3722.84	51.50	3671.34	0.00
	7/20/98	3720.60	3722.84	51.66	3671.18	0.00
MW-13	5/17/95	3721.63	3723.99	51.97	3672.02	0.00
	11/14/95	3721.63	3723.99	51.42	3672.57	0.00
	1/17/96	3721.63	3723.99	51.33	3672.66	0.00
	4/24/96	3721.63	3723.99	51.65	3672.34	0.00
	2/7/97	3721.63	3723.99	52.56	3671.43	0.00
	8/15/97	3721.63	3723.99	52.94	3671.05	0.00
	1/22/98	3721.63	3723.99	53.06	3670.93	0.00
	7/20/98	3721.63	3723.99	53.19	3670.80	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.002 feet/foot.

5.0 Groundwater Quality Conditions

5.1 Distribution of Hydrocarbons in Groundwater

A historical listing of benzene, toluene, ethylbenzene and xylene (BTEX) concentrations obtained from the on site monitoring wells is summarized in Table 3. Hydrocarbon concentration maps depicting the BTEX concentrations for the two 1998 sampling events are presented in Figure 3a (January 22, 1998) and Figure 3b (July 22, 1998). Figure 4 depicts benzene concentrations in groundwater from May 1995 to July 22, 1998 for the on site monitoring wells.

Based on the analytical results for samples collected by TRW on January 22, 1998 and July 22, 1998, the distribution of hydrocarbons at the Linam Ranch Plant is described below.

- BTEX concentrations in monitoring wells MW-9 and MW-12 were below the New Mexico Water Quality Control Commission (WQCC) standards for each constituent.
- Benzene concentrations in MW-10, MW-10D, MW-11, and MW-13 were 7.18 mg/L, 0.184 mg/L, 0.061 mg/L, and 0.061 mg/L, respectively, which exceed the WQCC standard of 0.001 mg/L.
- Benzene concentrations in MW-10 have remained relatively stable; however, both 1998 sampling events indicated increased benzene concentrations of 7.03 mg/L and 7.18 mg/L respectively.
- Benzene concentrations in MW-10D fluctuate over time but have declined from a high of 8.140 mg/L on the April 24, 1996, to a concentration of 0.184 mg/L on July 22, 1998.
- Benzene concentrations in MW-11 fluctuate over time but have declined from a high of 0.549 mg/L on the January 17, 1996, to a low of 0.0.061 mg/L on July 22, 1998.
- Benzene concentrations in MW-13 had increased from less than 0.001 mg/L, during the April 24, 1996 sampling event, to a high of 0.132 mg/L during the August 15, 1997 sampling event; however benzene concentrations have decreased to 0.082 mg/L and 0.061 mg/L during the January and July 1998 sampling events, respectively.
- The dissolved-phase hydrocarbons in groundwater are contained well within the boundaries of the facility.

Table 3

Summary of Dissolved BTEX Concentrations

Linam Ranch Plant - EOTT Tanks

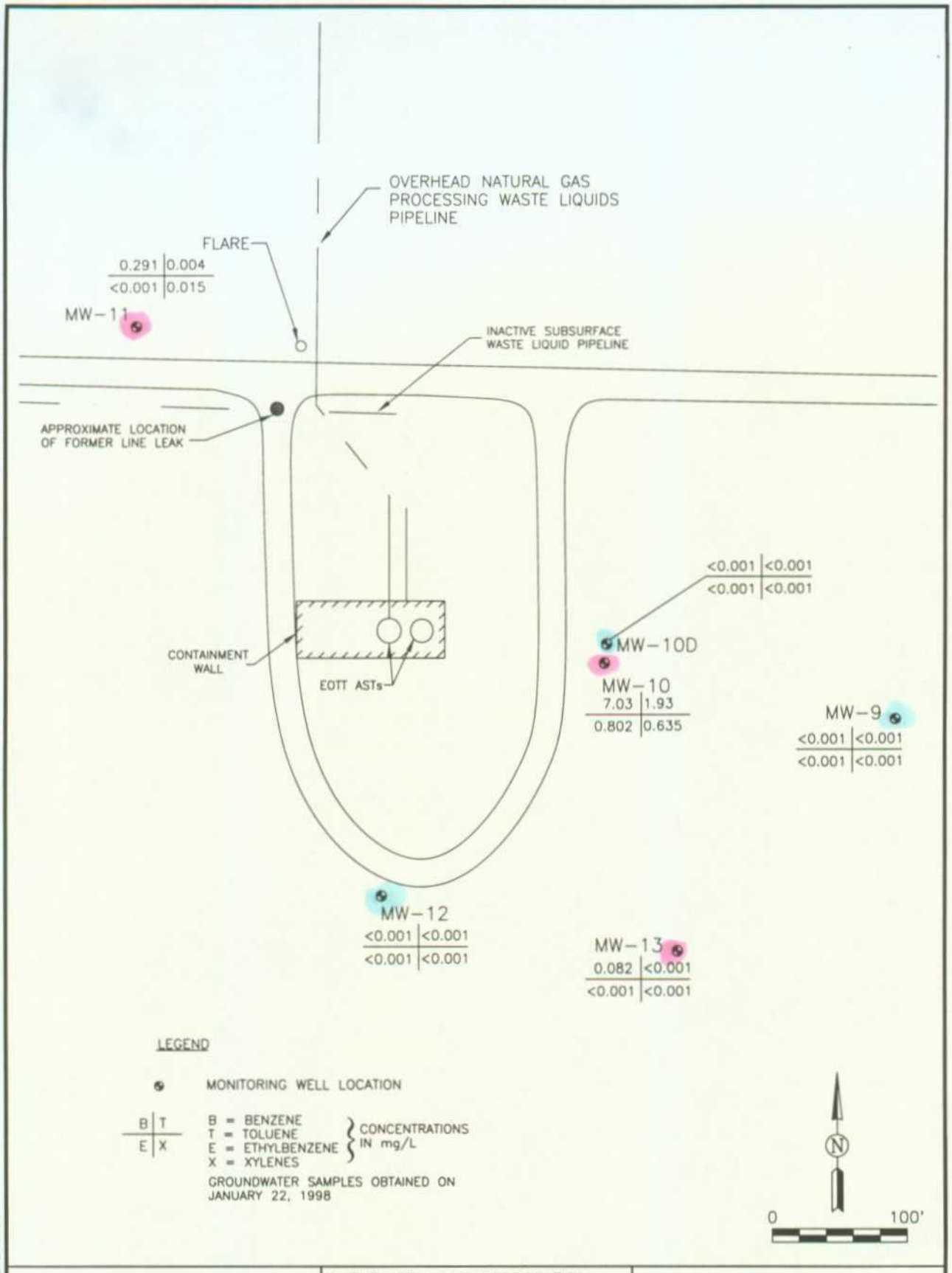
Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-9	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	< 0.001	< 0.001	< 0.001	< 0.001
	1/17/96	0.001	< 0.001	< 0.001	0.001
	4/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	1/22/97	< 0.001	< 0.001	< 0.001	< 0.001
	8/15/97	< 0.001	< 0.001	< 0.001	< 0.001
	1/22/98	< 0.001	< 0.001	< 0.001	< 0.001
	7/20/98	< 0.001	< 0.001	< 0.001	< 0.001
MW-10	5/17/95	**3.225**	0.052	0.049	0.169
	11/14/95	**5.230**	0.001	< 0.001	0.406
	1/17/96	**6.110**	**0.863**	**1.140**	**1.050**
	4/24/96	**6.940**	< 0.010	**1.190**	0.127
	1/22/97	**6.41**	**1.63**	0.294	**8.97**
	8/15/97	**5.63**	**1.35**	0.479	**0.453**
	1/22/98	**7.03**	**1.93**	**0.802**	**0.635**
	7/22/98	**7.18**	**2.34**	**0.777**	**0.606**
MW-10D	5/17/95	**0.096**	0.004	< 0.001	0.008
	11/14/95	**0.125**	0.001	< 0.001	0.011
	1/17/96	**0.841**	0.001	< 0.001	0.047
	4/24/96	**8.140**	0.046	**1.170**	0.076
	1/22/97	**0.365**	< 0.005	< 0.005	< 0.005
	8/15/97	**0.221**	<0.01	<0.01	<0.01
	1/22/98	< 0.001	< 0.001	< 0.001	< 0.001
	7/22/98	**0.184**	0.014	0.008	0.006
MW-11	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	**0.306**	< 0.001	< 0.001	0.013
	1/17/96	**0.549**	0.004	0.002	0.031
	4/24/96	**0.520**	< 0.002	< 0.002	< 0.002
	1/22/97	**0.267**	< 0.001	< 0.001	0.017
	8/15/97	**0.164**	<0.001	0.002	0.007
	1/22/98	**0.291**	0.004	< 0.001	0.015
	7/22/98	**0.061**	<0.001	< 0.001	0.010
MW-12	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	< 0.001	< 0.001	< 0.001	< 0.001
	1/17/96	< 0.001	< 0.001	< 0.001	< 0.001
	4/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	1/22/97	< 0.001	< 0.001	< 0.001	< 0.001
	8/15/97	0.001	<0.001	<0.001	<0.001
	1/22/98	< 0.001	<0.001	<0.001	<0.001
	7/22/98	0.002	<0.001	<0.001	<0.001
MW-13	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	0.003	< 0.001	0.001	< 0.001
	1/17/96	< 0.001	< 0.001	< 0.001	< 0.001
	4/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	1/22/97	**0.048**	< 0.001	< 0.001	< 0.001
	8/15/97	**0.132**	<0.001	<0.001	0.01
	1/22/98	**0.082**	<0.001	<0.001	< 0.001
	7/20/98	**0.061**	<0.001	<0.001	< 0.001
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 17, 1995 (EPA Method 8240).

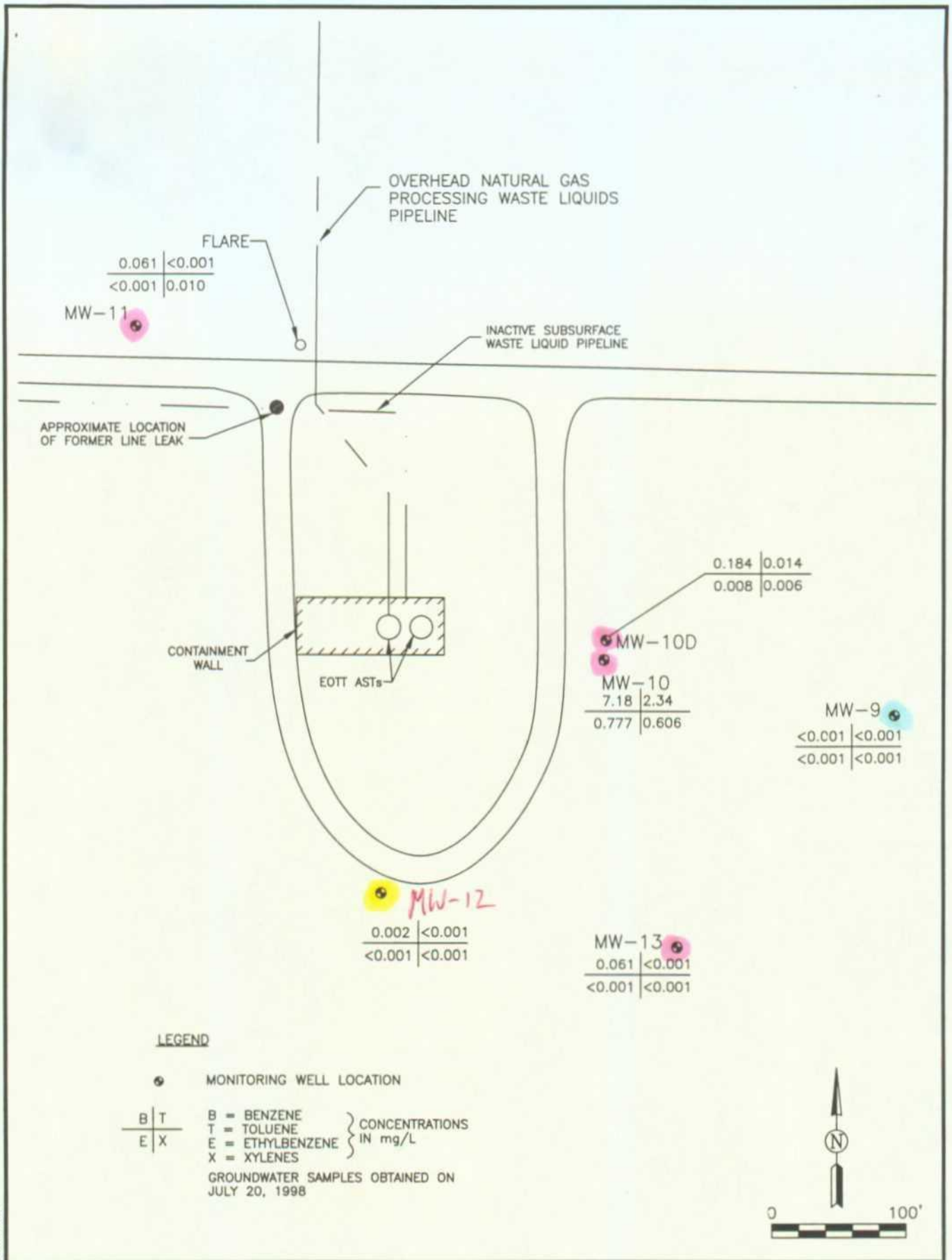
New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.

Values in boldface type indicate concentrations exceed WQCC groundwater standards



BDM	CLIENT: GPM GAS CORPORATION	FIGURE 3a LINAM RANCH PLANT BTEX CONCENTRATION MAP
	DATE: 01/22/98 | REV. NO.:	
	AUTHOR: GJV | DRN BY: DAG	
	CK'D BY: MWS | FILE: BTEX0198	

D:\P2398\21\BTEX0198



D:\P2398\21\BTEX0798

BDM

CLIENT: GPM GAS CORPORATION	
DATE: 07/20/98	REV. NO.:
AUTHOR: GJV	DRN BY: DAG
CK'D BY: MWS	FILE: BTEX0798

FIGURE 3b
LINAM RANCH PLANT
BTEX CONCENTRATION MAP

FIGURE 4

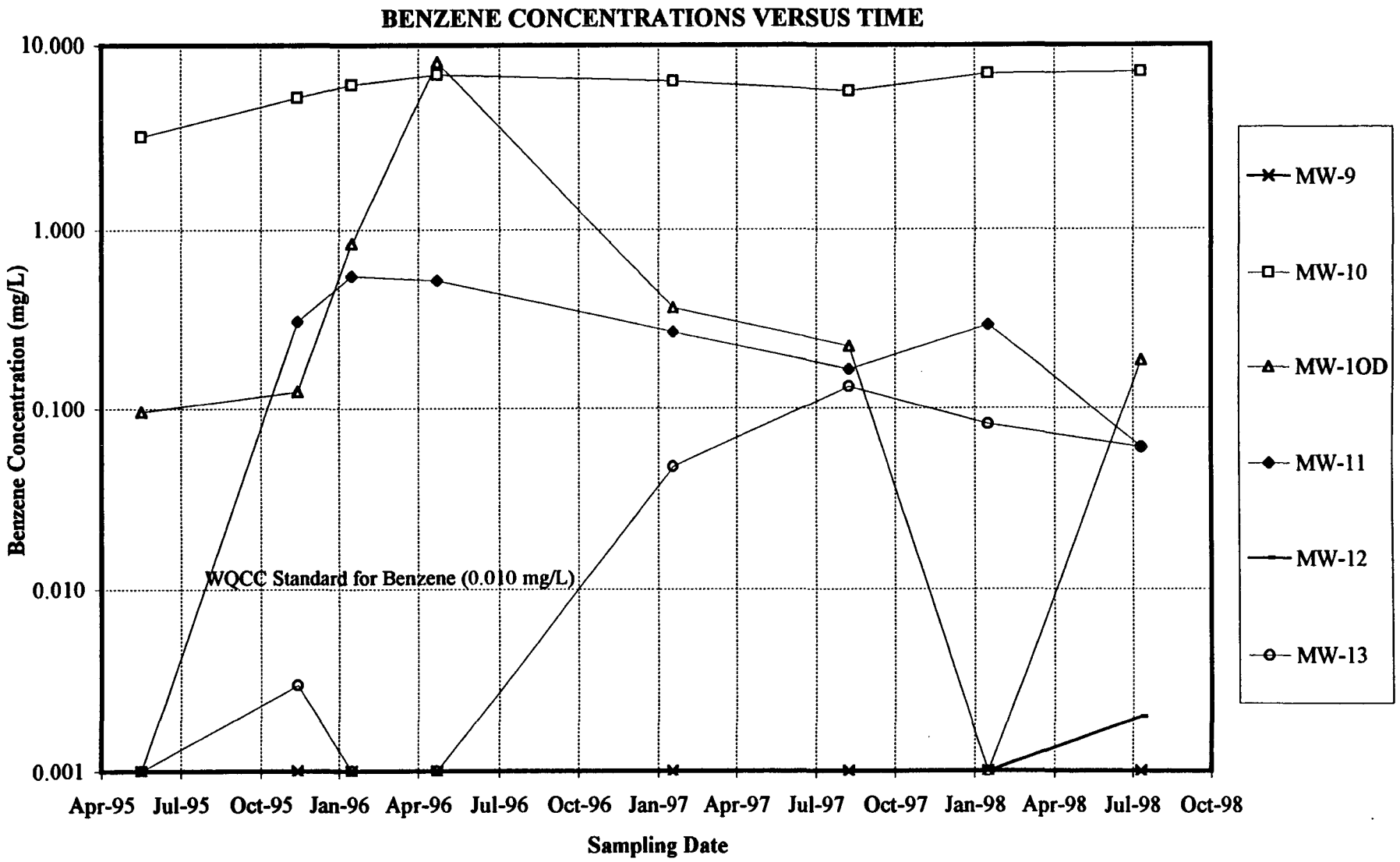

BENZENE CONCENTRATIONS VERSUS TIME
10.000
1.000
0.100
0.010
0.001
Benzene Concentration (mg/L)
WQCC Standard for Benzene (0.010 mg/L)
Apr-95
Jul-95
Oct-95
Jan-96
Apr-96
Jul-96
Oct-96
Jan-97
Apr-97
Jul-97
Oct-97
Jan-98
Apr-98
Jul-98
Oct-98
Sampling Date
MW-9
MW-10
MW-10D
MW-11
MW-12
MW-13

FIGURE 5

BTEX CONCENTRATIONS VS. TIME (MW-10)

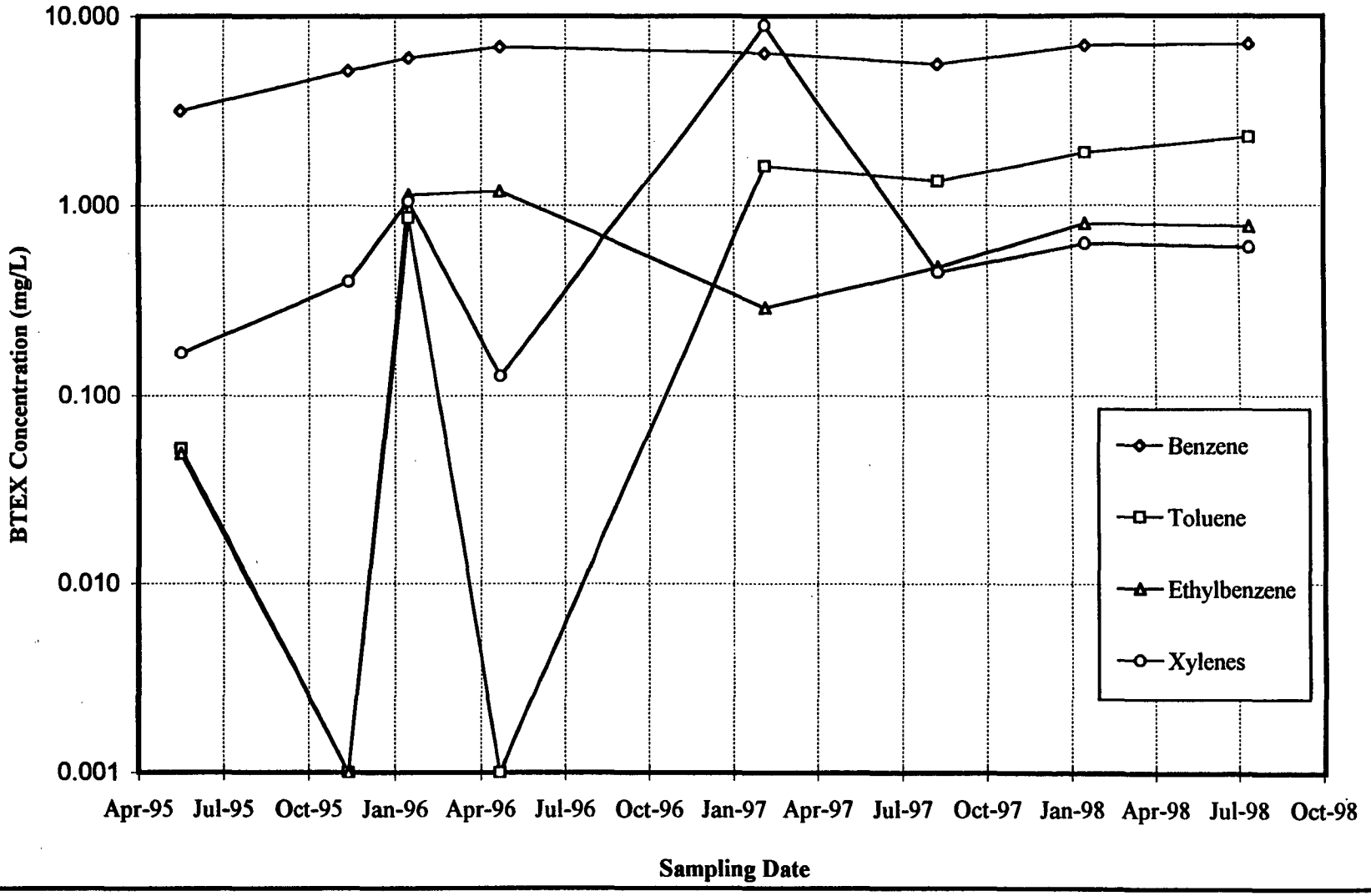
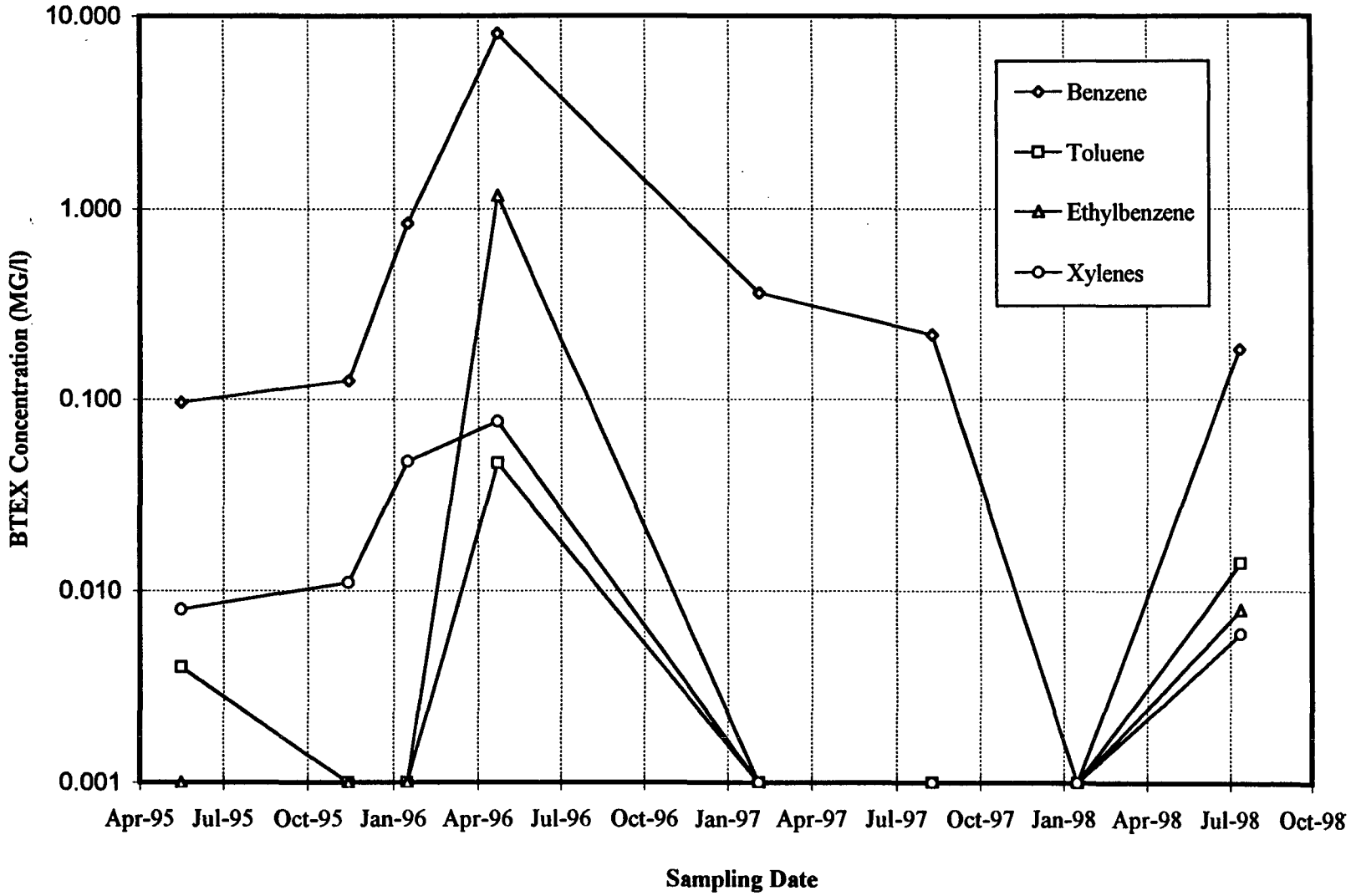


FIGURE 6

BTEX CONCENTRATIONS VS. TIME (MW-10D)



5.2 Distribution of WQCC Metals and Ions in Groundwater

Historical groundwater sample analytical results for WQCC metals (aluminum, chromium, iron, manganese, and silver) and selected ions (chloride, nitrate, sulfate, and TDS) are presented in Table 4. The WQCC standards are also listed in the table 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 metal analytical results for the 1998 annual sampling event indicate no constituents exceeded the WQCC standards with the exceptions of manganese and iron in MW-10. The elevated levels of manganese (0.77 mg/L) and iron (3.1 mg/L) in MW-10 appear to 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 resulting in higher concentrations. In contrast, cross-gradient and downgradient wells MW-9, MW-12, and MW-13 have much lower concentrations of manganese and iron. Based on the results of the metal analyses during the annual sampling event the groundwater in the site area is not adversely affected or impacted with dissolved metals.

The major cation and anion analyses for the annual 1998-sampling event indicate no constituents exceeded the WQCC standards with the exception of those listed below:

Total Dissolved Solids:	MW-11 (1,000 mg/L) and MW-12 (1,100 mg/L)
Nitrate:	MW-11 (19 mg/L) and MW-13 (12 mg/L)

The minor exceedance of the total dissolved solids (TDS) concentrations over the WQCC standards of 1,000 mg/L do not represent a significant risk to human health. Nitrate is commonly generated from fertilizing or septic sources; however, no such operations are known to exist in the area of the EOTT tanks. Since the groundwater is not extracted from the EOTT area of the gas plant, the nitrate levels observed in MW-11 and MW-13 do not represent a significant risk to human health. Furthermore, nitrate is an electron acceptor; therefore its presence in upgradient monitoring well MW-11 and downgradient well MW-13 may actually enhance the intrinsic biodegradation of the dissolved hydrocarbon plume.

Table 4
Summary of Analytical Results for WQCC Metals and Ions
Linam Ranch Plant - EOTT Tanks

Constituent	Date	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	WQCC Standards (mg/l)
WQCC Metals								
Aluminum (Al)	05-17-95	**26.58**	4.79	3.99	2.14	**5.35**	**14.08**	5.0
	04-24-96	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	08-11-97	0.50	<0.2	<0.2	<0.2	<0.2	<0.2	
	07-22-98	<0.01	<0.30	<0.30	<0.30	<0.30	0.36	
Chromium (Cr)	05-17-95	**0.06**	0.02	0.02	0.05	0.03	<0.01	0.05
	04-24-96	<0.05	<0.05	<0.05	<0.03	<0.05	<0.05	
	08-15-97	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
	07-22-98	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Iron (Fe)	05-17-95	**12.08**	**3.05**	**2.88**	**1.34**	**2.80**	**7.02**	1.0
	04-24-96	<0.03	0.26	0.22	0.13	<0.03	<0.03	
	08-15-97	0.91	0.61	0.39	0.11	0.48	0.24	
	07-22-98	0.07	**3.1**	0.60	<0.05	0.40	0.34	
Manganese (Mn)	05-17-95	0.15	**0.41**	**0.25**	0.15	0.07	0.11	0.2
	04-24-96	<0.01	**0.93**	0.17	0.08	<0.01	<0.01	
	08-15-97	<0.01	**0.63**	0.20	0.17	0.05	0.01	
	07-22-98	<0.01	**0.77**	0.15	0.09	0.05	0.01	
Silver (Ag)	05-17-95	<0.01	<0.01	<0.01	<0.01	<0.01	**0.18**	0.05
	04-24-96	<0.01	0.01	<0.01	0.02	<0.01	<0.01	
	08-15-97	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	07-22-98	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	
Major ions								
Chloride (Cl)	05-17-95	73	98	59	49	225	137	250
	04-24-96	58	72	72	28	91	96	
	08-15-97	57	120	78	39	**320**	190	
	07-22-98	53	67	82	31	210	97	
Nitrate (NO_3)	05-17-95	4.7	1.03	0.63	**28.6**	1.01	5.0	10.0
	04-24-96	0.2	<0.1	<0.1	1.9	<0.1	0.2	
	08-15-97	3.4	<1.0	<1.0	**40**	<1.0	4.5	
	07-22-98	5.4	3.50	4.0	**19**	0.71	**12**	
Sulfate (SO_4)	05-17-95	126	184	232	190	206	99	600
	04-24-96	60	16	21	124	53	46	
	08-15-97	82	210	180	160	210	78	
	07-22-98	72	40	140	200	130	74	
Total Dissolved Solids (TDS)	05-17-95	602	903	707	890	**1,128**	629	1,000
	04-24-96	579	909	861	963	736	667	
	08-15-97	**1,600**	**1,300**	910	**1,200**	**1,600**	930	
	07-22-98	580	820	690	**1,000**	**1,100**	800	

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 239.2, 270.2, 272.2, and 300.0
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples for metals analysis were not filtered on 5-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples for metals analysis were filtered with a 45 mm element on 4-24-96, 8-15-97, and 7-22-98, therefore results indicate total dissolved metals.

6.0 Intrinsic Bioremediation Assessment

Electron acceptors can be used by in situ microorganisms to achieve significant hydrocarbon degradation, therefore our suite of analytes included dissolved oxygen, (DO), sulfate (SO_4) and nitrate as nitrogen (NO_3). Electron acceptor results (biological parameters) are summarized in Table 5. Changes in dissolved oxygen, nitrate and sulfate concentrations with time are depicted in Figures 5, 6, and 7, respectively.

Hydrocarbon-impacted wells (MW-10, MW-10D, MW-11, and MW-13) are compared against non-impacted wells (MW-9 and MW-12) to observe whether or not significant differences are observed in electron acceptor concentrations that may be related to subsurface biodegradation. The following trends in the electron acceptor data are observed:

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

- Nitrate and sulfate concentrations fluctuate over time therefore no trend relationships are noted. However, the presence of these constituents as electron acceptors indicates their availability for use by micro-organisms in the course of hydrocarbon degradation.

Table 5

Summary of Biological Parameter Results

Linam Ranch Plant - EOTT Tanks

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
MW-9	5/17/95	1.85	4.70	126
	11/14/95	2.82	NA	NA
	1/17/96	5.3	NA	NA
	4/24/96	2.0	0.2	60
	1/22/97	14.6	3.4	71
	8/15/97	3.8	3.4	82
	1/22/98	5.2	4.1	160
	7/20/98	2.38	5.4	72
MW-10	5/17/95	1.05	1.030	184
	11/14/95	1.98	< 0.01	174
	1/17/96	5.0	< 0.5	40
	4/24/96	1.6	< 0.1	16
	1/22/97	8.75	< 0.1	25
	8/15/97	2.9	< 1.0	210
	1/22/98	4.5	0.22	52
	7/22/98	1.13	3.50	40
MW-10D	5/17/95	0.45	0.63	232
	11/14/95	2.41	NA	NA
	1/17/96	5.0	NA	NA
	4/24/96	1.8	< 0.1	21
	1/22/97	5.5	< 0.1	210
	8/15/97	1.8	< 1.0	180
	1/22/98	5.7	1.30	230
	7/22/98	1.49	4.0	140
MW-11	5/17/95	1.05	28.6	190
	11/14/95	2.30	1.56	184
	1/17/96	2.8	43.3	150
	4/24/96	2.0	1.9	124
	1/22/97	7.0	24	170
	8/15/97	1.8	40	160
	1/22/98	4.3	58	150
	7/22/98	1.06	19	200
MW-12	5/17/95	0.97	1.01	206
	11/14/95	3.15	NA	NA
	1/17/96	1.7	NA	NA
	4/24/96	1.8	< 0.1	53
	1/22/97	11.8	< 0.1	150
	8/15/97	1.9	< 1.0	210
	1/22/98	4.2	0.41	150
	7/22/98	2.52	0.71	130
MW-13	5/17/95	1.51	5.00	99
	11/14/95	5.00	0.02	44
	1/17/96	2.0	6.54	42
	4/24/96	2.6	0.2	46
	1/22/97	9.5	5.4	65
	8/15/97	5.1	4.5	78
	1/22/98	7.4	7.3	88
	7/20/98	3.62	12	74

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

Dissolved oxygen (DO) readings obtained with ICM Model 31250, YSI Model 51B, and Hanna DO meters.

FIGURE 7

DISSOLVED OXYGEN CONCENTRATIONS VERSUS TIME

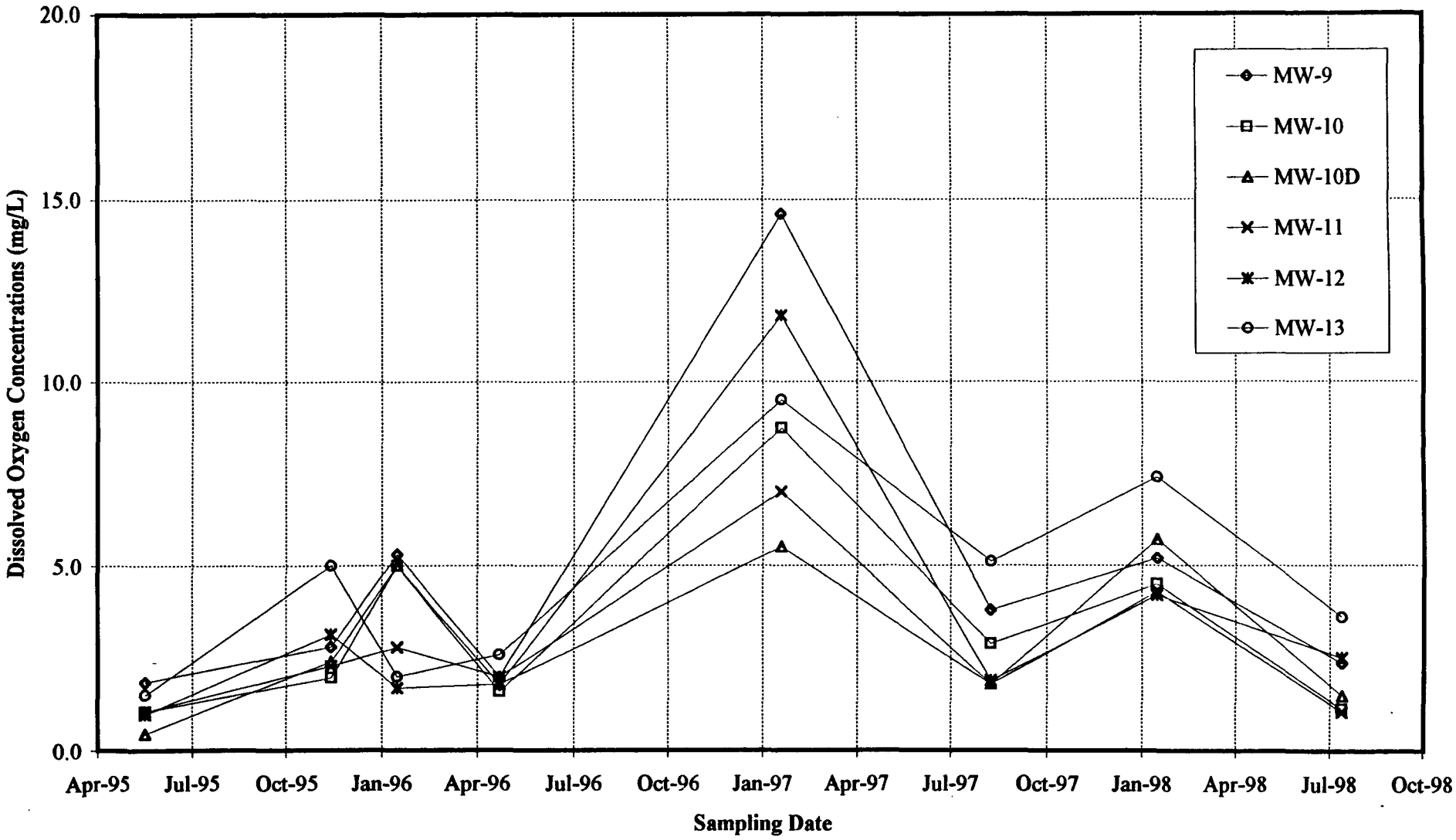


FIGURE 8

NITRATE CONCENTRATIONS VERSUS TIME

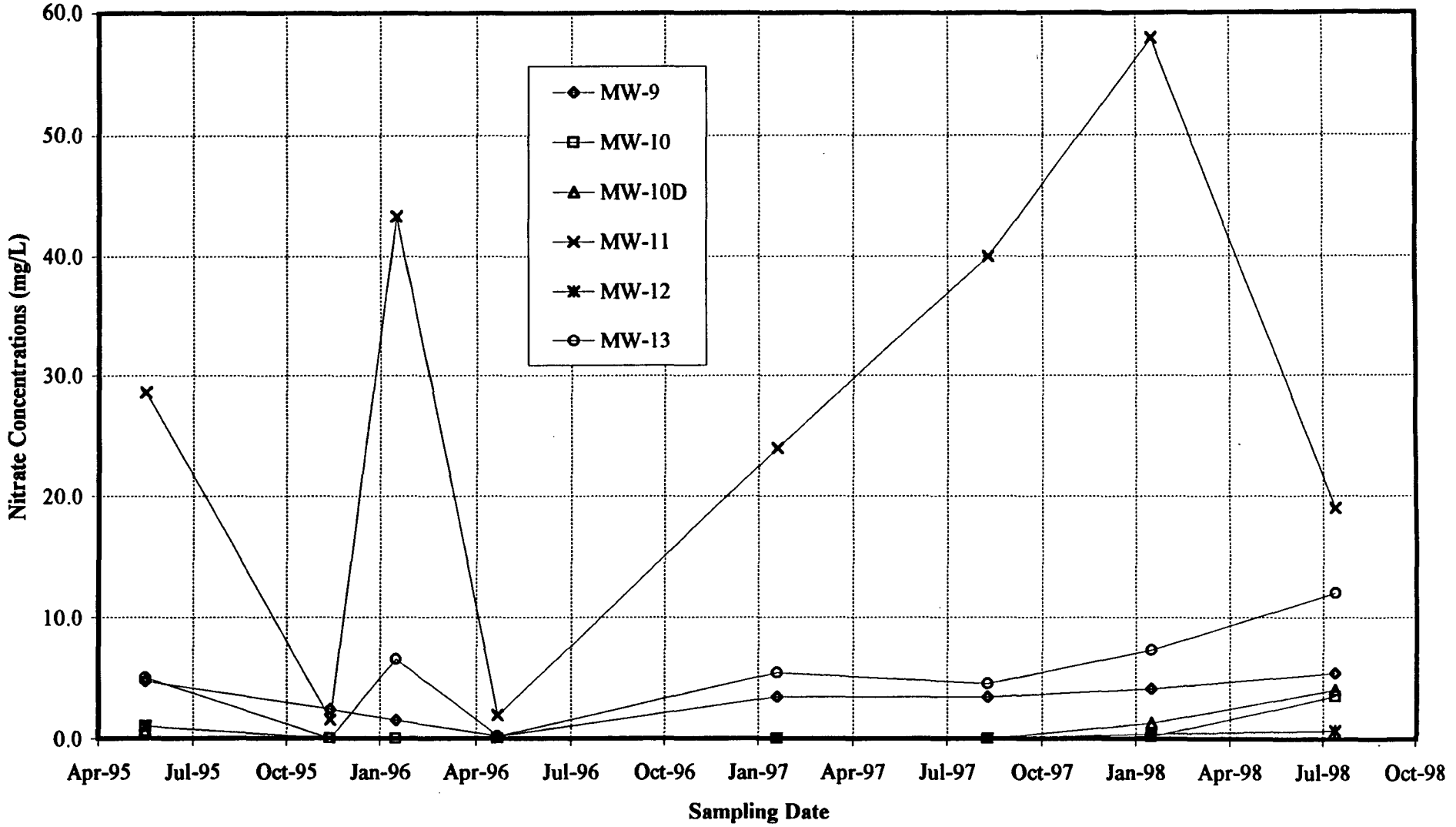
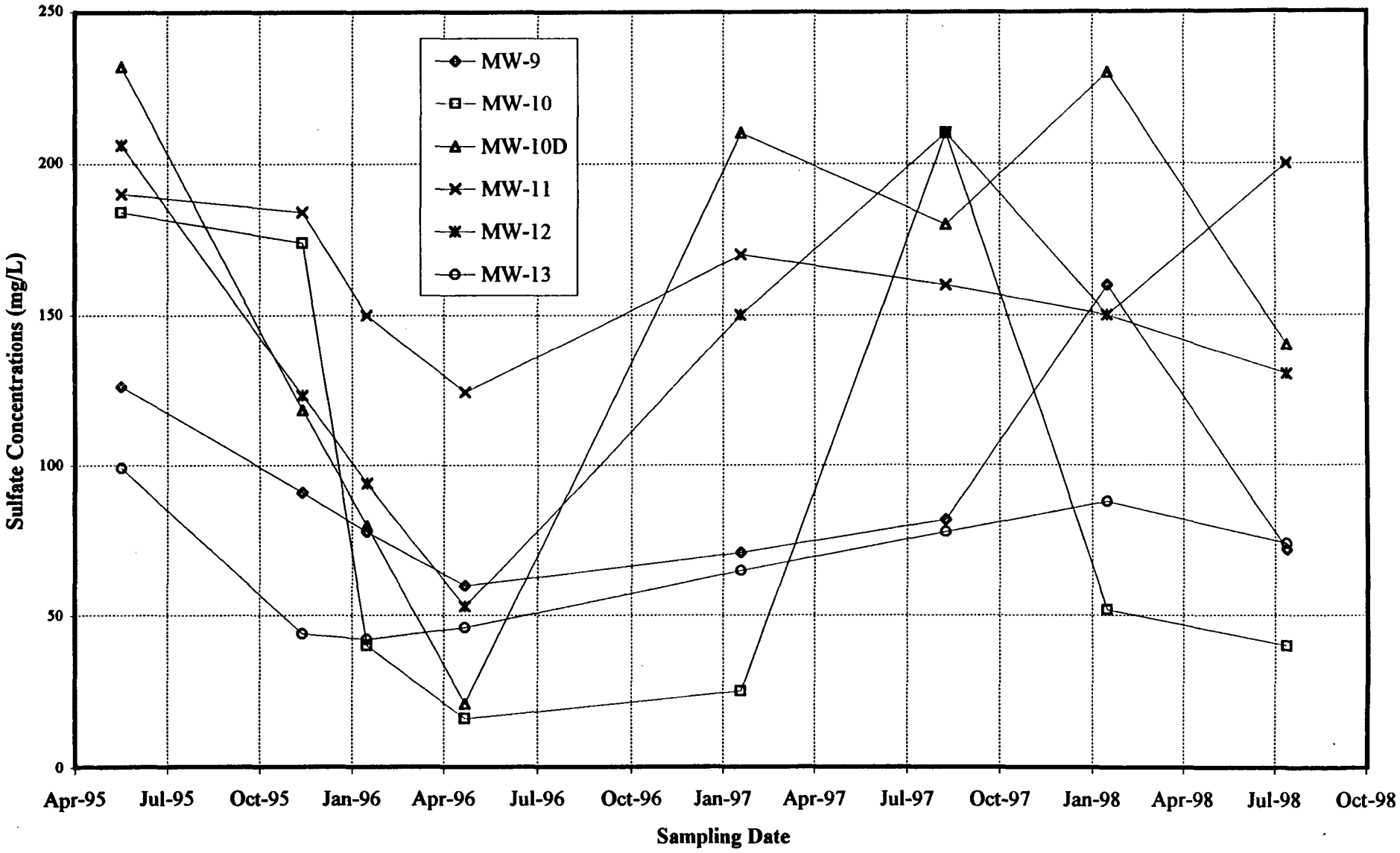


FIGURE 9

SULFATE CONCENTRATIONS VERSUS TIME



7.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Linam Ranch Plant are presented below.

- BTEX concentrations in monitoring wells MW-9 and MW-12 remained well below the WQCC standards for each constituent.
- Benzene concentrations in MW-10, MW-10D, MW-11, and MW-13 were 7.18 mg/L, 0.184 mg/L, 0.061 mg/L, and 0.061 mg/L, respectively, which exceed the WQCC standard of 0.010 mg/L.
- Benzene concentrations in MW-10 have remained relatively stable; however, both 1998 sampling events indicated increased benzene concentrations of 7.03 mg/L and 7.18 mg/L respectively.
- Benzene concentrations in MW-10D fluctuate over time but have declined from a high of 8.140 mg/L on the April 24, 1996, to a concentration of 0.184 mg/L on July 22, 1998.
- Benzene concentrations in MW-11 fluctuate over time but have declined from a high of 0.549 mg/L on the January 17, 1996, to a low of 0.061 mg/L on July 22, 1998.
- Benzene concentrations in MW-13 had increased from less than 0.001 mg/L, during the April 24, 1996 sampling event, to a high of 0.132 mg/L during the August 15, 1997 sampling event; however benzene concentrations have decreased to 0.082 mg/L and 0.061 mg/L during the January and July 1998 sampling events, respectively.
- Continued semi-annual sampling is necessary to monitor plume stability and to evaluate the effectiveness of natural attenuation in limiting the downgradient migration of the plume.
- The dissolved-phase hydrocarbons in groundwater are contained well within the boundaries of the facility.
- Based on the historical results of the inorganic analyses, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions. Although iron and manganese concentrations exceed WQCC standards, increased levels of these constituents indicate intrinsic bioremediation processes are active.

8.0 Recommendations

The following recommendations are proposed to monitor the groundwater conditions at the Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 1999.
- Benzene concentrations in downgradient well MW-13 should be monitored closely prior to initiating additional corrective action. It is expected that the benzene concentrations in MW-13 will continue decreasing and return to levels below the WQCC standards during subsequent sampling events.

APPENDIX A

Laboratory Analytical Reports

and

Chain of Custody Documentation

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

13230

Chain of Custody

Date 7/23/98 Page 1 Of 1

Lab Name Trace Analysis Inc.
Address 6701 Aberdeen Av.
Lubbock, Tx 79424
Telephone (806) 794-1296

Samplers (SIGNATURES) John Fergerson

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX	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	TPH/BTEX Modified 8015	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)	Metals: Ag, Al, Cr, Fe, Mn	Ions: Cl, SO_4, NO_3	TDS		Number of Containers
9807201440	Water	MW-9		✓																					✓	✓	✓		4
9807221140	Water	MW-10		✓																					✓	✓	✓		4
9807221245	Water	MW-10d		✓																					✓	✓	✓		4
9807221400	Water	MW-11		✓																					✓	✓	✓		4
9807221015	Water	MW-12		✓																					✓	✓	✓		4
9807220915	Water	MW-12d		✓																									2
9807201645	Water	MW-13		✓																					✓	✓	✓		4
9807221430	Water	Rinsate		✓																									2

Project Information	
Project	Linam Ranch Plant
Project Director	Gil Van Deventer
Charge Code No.	LREOTT-20-300
Shipping ID. No.	
Via:	

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

Special Instructions/Comments: Bill direct to GPM (Mel Driver)

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) John Fergerson (Time) 3:55	(Signature) (Time)	(Signature) (Time)
(Printed Name) John Fergerson (Date) 7/23/98	(Printed Name) (Date)	(Printed Name) (Date)
(Company) BDM International	(Company)	(Company)

Received By 1.	Received By 2.	Received By (Laboratory) 3.
(Signature) Thomas (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) 7/23 (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company) Trace 3:55pm	(Company)	(Laboratory)

Distribution: White, Canary-Laboratory • Pink, BDM

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
BDM International

Attention Gil VanDeVenter
415 W. Wall, Suite 1818
Midland TX 79701

Date: Jul 28, 1998
Date Rec: 7/24/98
Project: Linam Ranch Plant
Proj Name: N/A
Proj Loc: N/A

Lab Receiving # : 9807000429
Sampling Date: 7/22/98
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)
103311	MW-9	Water	0.006	<0.001	<0.001	<0.001	0.006
103313	MW-10D	Water	0.184	0.014	0.008	0.006	0.212
103314	MW-11	Water	0.061	<0.001	<0.001	0.010	0.071
103315	MW-12	Water	0.002	<0.001	<0.001	<0.001	0.002
103316	MW-12D	Water	0.002	<0.001	<0.001	<0.001	0.002
103317	MW-13	Water	0.061	<0.001	<0.001	<0.001	0.061
103318	Rinsate	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	0.102	0.104	0.323	
RPD			4	4	4	5	
% Extraction Accuracy			104	102	103	109	
% Instrument Accuracy			106	102	104	108	

TEST	PREP METHOD	PREP DATE	ANALYSIS METHOD	ANALYSIS COMPLETED	CHEMIST	QC: (mg/L)	SPIKE: (mg/L)
BTEX	EPA 5030	7/27/98	EPA 8021B	7/27/98	JG	0.100 ea	0.1 ea

Director, Dr. Blair Leftwich

7-28-98
Date

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
BDM International
Attention Gil VanDeVenter
415 W. Wall, Suite 1818
Midland TX 79701

Date: Jul 30, 1998
Date Rec: 7/24/98
Project: Linam Ranch Plant
Proj Name: N/A
Proj Loc: N/A

Lab Receiving # : 9807000429
Sampling Date: 7/22/98
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)
103312	MW-10	Water	7.18	2.34	0.777	0.606	10.9
Method Blank			<0.001	<0.001	<0.001	<0.001	
Reporting Limit			0.001	0.001	0.001	0.001	
QC			0.109	0.104	0.106	0.326	
RPD			2	1	1	1	
% Extraction Accuracy			113	108	108	115	
% Instrument Accuracy			109	104	106	109	

TEST	PREP METHOD	PREP DATE	ANALYSIS METHOD	ANALYSIS COMPLETED	CHEMIST	QC: (mg/L)	SPIKE: (mg/L)
BTEX	EPA 5030	7/30/98	EPA 8021B	7/30/98	MLS	0.100 ea	0.1 ea

BL

Director, Dr. Blair Leftwich

7-30-98

Date

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

Sampling Date: 07/20,22/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TOTAL Cr (mg/L)	TOTAL Ag (mg/L)	TOTAL Al (mg/L)	TOTAL Fe (mg/L)	TOTAL Mn (mg/L)
T103311	9807201440 MW-9	<0.01	<0.002	<0.30	0.07	<0.01
T103312	9807221140 MW-10	<0.01	<0.002	<0.30	3.1	0.77
T103313	9807221245 MW-10d	<0.01	<0.002	<0.30	0.60	0.15
T103314	9807221400 MW-11	<0.01	<0.002	<0.30	<0.05	0.09
T103315	9807221015 MW-12	<0.01	<0.002	<0.30	0.40	0.05
ICV		2.5	0.50	2.5	2.5	2.6
CCV		2.5	0.50	2.5	2.5	2.4
REPORTING LIMIT		0.01	0.002	0.30	0.05	0.01
RPD		0	0	0	5	0
% Extraction Accuracy		90	90	105	90	90
% Instrument Accuracy		100	100	100	100	100
PREP DATE		07/27/98	07/27/98	07/27/98	07/27/98	07/27/98
ANALYSIS DATE		07/28/98	07/28/98	07/28/98	07/28/98	07/28/98

METHODS: EPA SW 846-3015, 6010B.
CHEMIST: RR
TOTAL METALS SPIKE: 2.0 mg/L Cr, Al, Fe, Mn; 1.0 mg/L Ag.
TOTAL METALS CV: 2.5 mg/L Cr, Al, Fe, Mn; 0.50 mg/L Ag.

Director, Dr. Blair Leftwich

7-31-98
Date

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

Sampling Date: 07/20/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TOTAL Cr (mg/L)	TOTAL Ag (mg/L)	TOTAL Al (mg/L)	TOTAL Fe (mg/L)	TOTAL Mn (mg/L)
T103317	9807201645 MW-13	0.03	<0.002	0.36	0.34	0.01
ICV		2.4	0.51	2.6	2.5	2.5
CCV		2.6	0.50	2.5	2.5	2.4
REPORTING LIMIT		0.01	0.002	0.30	0.05	0.01
RPD		0	5	5	0	0
% Extraction Accuracy		100	94	90	100	100
% Instrument Accuracy		100	100	100	100	96
PREP DATE		07/27/98	07/27/98	07/27/98	07/27/98	07/27/98
ANALYSIS DATE		07/28/98	07/28/98	07/28/98	07/28/98	07/28/98

METHODS: EPA SW 846-3015, 6010B.
CHEMIST: RR
TOTAL METALS SPIKE: 2.0 mg/L Cr, Al, Fe, Mn; 1.0 mg/L Ag.
TOTAL METALS CV: 2.5 mg/L Cr, Al, Fe, Mn; 0.50 mg/L Ag.

Director, Dr. Blair Leftwich

7-31-98
Date

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E-Mail: lab@traceanalysis.com

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

Sampling Date: 07/22/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TDS (mg/L)	CHLORIDE (mg/L)	N03-N (mg/L)	SULFATE (mg/L)
T103311	9807201440 MW-9	580	53	5.4	72
ICV		---	11	4.6	11
CCV		---	11	4.6	11
REPORTING LIMIT		10	0.5	0.2	0.5
RPD		0	0	0	1
% Extraction Accuracy		---	90	93	82
% Instrument Accuracy		101	91	93	93
PREP DATE		07/28/98	07/27/98	07/27/98	07/27/98
ANALYSIS DATE		07/28/98	07/27/98	07/27/98	07/27/98

METHODS: EPA 300.0, 160.1.
CHEMIST: TDS: RS N03-N/CHLORIDE/SULFATE: JS
SPIKE: 31.25 mg/L CHLORIDE, SULFATE; 12.5 mg/L N03-N.
CV: 12.5 mg/L CHLORIDE, SULFATE; 5.0 mg/L N03-N.

BL

Director, Dr. Blair Leftwich

7-31-98

Date

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

Sampling Date: 07/22/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TDS (mg/L)	CHLORIDE (mg/L)	N03-N (mg/L)	SULFATE (mg/L)
T103312	9807221140 MW-10	820	67	3.5	40
ICV		—	11	4.6	11
CCV		—	11	4.6	11
REPORTING LIMIT		10	0.5	0.2	0.5
RPD		0	0	0	1
% Extraction Accuracy		—	90	93	82
% Instrument Accuracy		102	91	93	93
PREP DATE		07/29/98	07/27/98	07/27/98	07/27/98
ANALYSIS DATE		07/29/98	07/27/98	07/27/98	07/27/98

METHODS: EPA 300.0, 160.1.
CHEMIST: TDS: RS N03-N/CHLORIDE/SULFATE: JS
SPIKE: 31.25 mg/L CHLORIDE, SULFATE; 12.5 mg/L N03-N.
CV: 12.5 mg/L CHLORIDE, SULFATE; 5.0 mg/L N03-N.

BL

Director, Dr. Blair Leftwich

7-31-98

Date

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

Sampling Date: 07/22/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TDS (mg/L)	CHLORIDE (mg/L)	N03-N (mg/L)	SULFATE (mg/L)
T103313	9807221245 MW-10d	690	82	4.0	140
ICV		—	11	4.6	11
CCV		—	11	4.6	11
REPORTING LIMIT		10	0.5	0.2	0.5
RPD		0	0	0	1
% Extraction Accuracy		—	90	93	82
% Instrument Accuracy		102	91	93	93
PREP DATE		07/29/98	07/27/98	07/27/98	07/27/98
ANALYSIS DATE		07/29/98	07/27/98	07/27/98	07/27/98

METHODS: EPA 300.0, 160.1.
CHEMIST: TDS: RS N03-N/CHLORIDE/SULFATE: JS
SPIKE: 31.25 mg/L CHLORIDE, SULFATE; 12.5 mg/L N03-N.
CV: 12.5 mg/L CHLORIDE, SULFATE; 5.0 mg/L N03-N.

Director, Dr. Blair Leftwich

7-31-98
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

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

Sampling Date: 07/22/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TDS (mg/L)	CHLORIDE (mg/L)	N03-N (mg/L)	SULFATE (mg/L)
T103314	9807221400 MW-11	1,000	31	19	200
ICV		—	11	4.6	11
CCV		—	11	4.6	11
REPORTING LIMIT		10	0.5	0.2	0.5
RPD		0	0	0	1
% Extraction Accuracy		—	90	93	82
% Instrument Accuracy		102	91	93	93
PREP DATE		07/29/98	07/27/98	07/27/98	07/27/98
ANALYSIS DATE		07/29/98	07/27/98	07/27/98	07/27/98

METHODS: EPA 300.0, 160.1.
CHEMIST: TDS: RS N03-N/CHLORIDE/SULFATE: JS
SPIKE: 31.25 mg/L CHLORIDE, SULFATE; 12.5 mg/L N03-N.
CV: 12.5 mg/L CHLORIDE, SULFATE; 5.0 mg/L N03-N.

Director, Dr. Blair Leftwich

7-31-98
Date

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

Sampling Date: 07/22/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TDS (mg/L)	CHLORIDE (mg/L)	N03-N (mg/L)	SULFATE (mg/L)
T103315	9807221015 MW-12	1,100	210	0.71	130
ICV		—	11	4.6	11
CCV		—	11	4.7	11
REPORTING LIMIT		10	0.5	0.2	0.5
RPD		0	1	2	1
% Extraction Accuracy		—	91	88	89
% Instrument Accuracy		102	92	92	93
PREP DATE		07/29/98	07/27/98	07/28/98	07/27/98
ANALYSIS DATE		07/29/98	07/27/98	07/28/98	07/27/98

METHODS: EPA 300.0, 160.1.
CHEMIST: TDS: RS N03-N/CHLORIDE/SULFATE: JS
SPIKE: 31.25 mg/L CHLORIDE, SULFATE; 25 mg/L N03-N.
CV: 12.5 mg/L CHLORIDE, SULFATE; 5.0 mg/L N03-N.

Director, Dr. Blair Leftwich

7-31-98
Date

TRACEANALYSIS, INC.

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E-Mail: lab@traceanalysis.com

July 31, 1998
Receiving Date: 07/24/98
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 13230

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

Sampling Date: 07/20/98
Sample Condition: Intact & Cool
Sample Received by: VW
Project Name: Linam Ranch Plant

TA#	FIELD CODE	TDS (mg/L)	CHLORIDE (mg/L)	N03-N (mg/L)	SULFATE (mg/L)
T103317	9807201645 MW-13	800	97	12	74
ICV		—	11	4.6	11
CCV		—	11	4.6	11
REPORTING LIMIT		10	0.5	0.2	0.5
RPD		0	1	0	1
% Extraction Accuracy		—	91	91	89
% Instrument Accuracy		101	92	93	93
PREP DATE		07/28/98	07/27/98	07/27/98	07/27/98
ANALYSIS DATE		07/28/98	07/27/98	07/27/98	07/27/98

METHODS: EPA 300.0, 160.1.
CHEMIST: TDS: RS N03-N/CHLORIDE/SULFATE: JS
SPIKE: 31.25 mg/L CHLORIDE, SULFATE; 12.5 mg/L N03-N.
CV: 12.5 mg/L CHLORIDE, SULFATE; 5.0 mg/L N03-N.

Director, Dr. Blair Leftwich

7-31-98
Date

89822-30

375

13114

BDM

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

Chain of Custody

Date 1-23-97 Page 1 Of 1

Lab Name Trace Analysis Inc
Address 6701 Aberdeen Ave
Lubbock, Tx 79424
Telephone 800 378 1298

Samplers (SIGNATURES)

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 C TEX	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	TPH/BTEX Modified 8015	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
9801221400	Water	MW-12		✓								89822													✓				3
9801221340	Water	MW-9		✓										23											✓				3
9801221450	Water	MW-13		✓										24											✓				3
9801221557	Water	MW-11		✓										25											✓				3
9801221705	Water	MW-10		✓										26											✓				3
9801221710	Water	MW-10d		✓										27											✓				3
9801221630	Water	MW-11d		✓										28															2
9801221615	Water	Rinsate		✓										29															2
172A & 172B	Water	Trip Blank		✓										30															2

Project Information	Sample Receipt	Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Project GPM-Linam	Total No. of Containers	(Signature) (Time) 2:30pm	(Signature) (Time)	(Signature) (Time)
Project Director G. Van Deventer	Chain of Custody Seals	Gil Van Deventer 1-23-98		
Charge Code No. P/2398/SC	Rec'd Good Condition/Cold	(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
Shipping ID. No.	Conforms to Record	BDM International		
	Lab No.	(Company)	(Company)	(Company)
Via:		Received By 1.	Received By 2.	Received By (Laboratory) 3.
		(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
		(Printed Name) (Date)	(Printed Name) (Date)	M. Lopez 1-24-98 (Printed Name) (Date)
		(Company)	(Company)	Trace Analysis (Laboratory)

Special Instructions/Comments: Bill direct to GPM (Mel Price)
GPM Proj. No - LREOTT-20-300

1st Bus 154-691-6767

Distribution: White, Canary-Laboratory • Pink, BDM

F 30-98

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

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

January 28, 1998
Receiving Date: 01/24/98
Sample Type: Water
Charge Code: P/2398/5C
Project Location: GPM - Linam

Prep Date: 01/24/98
Analysis Date: 01/24/98
Sampling Date: 01/22/98
Sample Condition: Intact & Cool
Sample Received by: ML
Project Name: GPM

TA#	FIELD CODE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	M,P,O XYLENE (mg/L)	TOTAL BTEX (mg/L)
T89822	9801221400 MW-12	<0.001	<0.001	<0.001	<0.001	<0.001
T89823	9801221340 MW-9	<0.001	<0.001	<0.001	<0.001	<0.001
T89824	9801221450 MW-13	0.082	<0.001	<0.001	<0:001	0.082
T89825	9801221557 MW-11	0.291	0.004	<0.001	0.015	0.310
T89826	9801221705 MW-10	7.03	1.93	0.802	0.635	10.4
T89827	9801221710 MW-10D	<0.001	<0.001	<0.001	<0.001	<0.001
T89828	9801221630 MW-11D	0.289	0.004	<0.001	0.015	0.308
T89829	9801221615 Rinsate	<0.001	<0.001	<0.001	<0.001	<0.001
T89830	172A & 172B Trip Blank	<0.001	<0.001	<0.001	<0.001	<0.001
QC	Quality Control	0.097	0.097	0.094	0.286	
REPORTING LIMIT		0.001	0.001	0.001	0.001	
RPD		5	6	6	6	
% Extraction Accuracy		93	92	89	91	
% Instrument Accuracy		97	97	94	95	

METHODS: EPA SW 846-8021B, 5030.
CHEMIST: JG
BTEX SPIKE AND QC: 0.100 mg/L BTEX.

BL

Director, Dr. Blair Leftwich

1-28-98

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
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 West Wall, Suite 1818
Midland, TX 79701

February 11, 1998
Receiving Date: 01/24/98
Sample Type: Water
Project No: P/2398/5C
Project Location: GPM - Linam
COC# 13114

Prep Date: 02/04/98
Analysis Date: 02/04/98
Sampling Date: 01/22/98
Sample Condition: Intact & Cool
Sample Received by: ML
Project Name: GPM

TA#	FIELD CODE	N03-N (mg/L)	SULFATE (mg/L)
T89822	9801221400 MW-12	0.41	150
T89823	9801221340 MW-9	4.1	160
T89824	9801221450 MW-13	7.3	88
T89825	9801221557 MW-11	58	150
T89826	9801221705 MW-10	0.22	52
T89827	9801221710 MW-10D	1.30	230
ICV		1.34	8.8
CCV		1.26	8.6
METHOD BLANK		<0.01	<1.0
REPORTING LIMIT		0.01	1.0
RPD		3	4
% Extraction Accuracy		97	90
% Instrument Accuracy		98	87

METHODS: EPA 375.4, 353.3.
CHEMIST: N03-N: RS/RC SULFATE: JS
N03-N SPIKE: 19.99 mg/L N03-N.
N03-N CV: 1.33 mg/L N03-N.
SULFATE SPIKE: 100 mg/L SULFATE.
SULFATE CV: 10 mg/L SULFATE.

Director, Dr. Blair Leftwich

2-11-98
DATE

1997 Annual Groundwater Monitoring and Sampling Report
GPM - Linam Ranch Natural Gas Plant
Lea County, New Mexico

DECEMBER 2, 1997

Prepared For:

GPM Gas Corporation
4044 Penbrook
Odessa, Texas 79762

Prepared By:

BDM

BDM International, Inc.
415 West Wall, Suite 1818
Midland, Texas 79701

1997 Annual Groundwater Monitoring and Sampling Report
GPM - Linam Ranch Gas Plant
Lea County, New Mexico

Prepared by:

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Midland, Texas 79701
(915) 682-0008
FAX (915) 682-0028

SUBMITTED BY: DATE:

Gilbert J. Van Deventer, REM
Project Manager

12-2-97

REVIEWED BY: DATE:

for Michael W. Selke, RG
Senior Program Director

12/2/97

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APPENDICES

1.0 Executive Summary

BDM International, Inc. (BDM) was retained by GPM Gas Corporation (GPM) to perform the sampling and monitoring operations at the Linam Ranch Plant. This 1997 annual report documents the two semi-annual sampling events performed by BDM at the GPM Linam Ranch Plant on January 22, 1997 and August 15, 1997. 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) as specified in his letter dated February 15, 1997.

Based on the sampling and monitoring data to date, the following conclusions relevant to groundwater conditions at the Linam Ranch Plant are evident:

- BTEX concentrations in monitoring wells MW-9 and MW-12 were below the laboratory detection limits and New Mexico Water Quality Control Commission (WQCC) standards for each constituent.

- Benzene concentrations in MW-10, MW-10D, MW-11, and MW-13 were 5.63 mg/L, 0.221 mg/L, 0.164 mg/L, and 0.132 mg/L, respectively, which exceed the WQCC standard of 0.001 mg/L.

- Benzene concentrations in MW-10, MW-10D, and MW-11 have declined since the April 24, 1996 sampling event.

- Benzene concentrations in MW-13 have increased from less than 0.001 mg/L during the April 24, 1996 sampling event to 0.132 mg/L during the August 15, 1997 sampling event.

- The benzene increase in MW-13 and concurrent decrease in MW-10, MW-10D and MW-11 indicates a minor movement of the dissolved hydrocarbon plume in the downgradient direction.

- Continued semi-annual monitoring is necessary to track the movement or steady state condition of the plume and to evaluate the effectiveness of intrinsic bioremediation in limiting the migration or elimination of the dissolved hydrocarbons.

- The dissolved-phase hydrocarbons in groundwater are contained well within the boundaries of the facility.

- Based on the results of the inorganic analyses during the annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions.

The following actions are recommended for monitoring groundwater conditions at the Linam Ranch Plant.

- The sampling and monitoring program should continue on a semi-annual basis. The next sampling event is scheduled during the first quarter of 1998.

- Benzene concentrations in downgradient well MW-13 will be monitored closely prior to initiating additional corrective action. It is expected that the benzene concentrations in MW-13 will return to levels below the WQCC standards during subsequent sampling events.

- Since the groundwater is not adversely impacted with inorganic constituents, as reported throughout the previous two years, analysis of dissolved metals and major ions is an unnecessary expense. Further analysis of the WQCC metals and major ions should be discontinued with the exception of manganese, chloride, sulfate, nitrate and TDS.

2.0 Chronology of Events

February 7, 1994	Geoscience Consultants Ltd (GCL) was retained by ENRON Operations Corporation (ENRON) to address groundwater quality conditions at the Hobbs Gas Plant which was scheduled for acquisition by GPM. As part of a subsurface investigation for two areas within the plant, GCL completed temporary drive point wells DP-1 and DP-2 downgradient and upgradient, respectively, of the EOTT tanks, and one monitoring well, MW-8, downgradient of the former liquid waste disposal area. Hydrocarbon-impacted groundwater was identified in DP-1.
May 18-22, 1994	Daniel B. Stevens and Associates (DBS&A) completed seven temporary drive point wells (EOTT-1 through EOTT-7) to delineate the areal extent of hydrocarbon-impacted soils and groundwater in the EOTT tank area. Drive point well EOTT-6 was converted into monitoring well MW-9. Hydrocarbon-impacted groundwater was identified east of the EOTT tanks.
October 7, 1994	The OCD requested ENRON to provide a work plan to completely define the extent of groundwater contamination at the Hobbs Gas Plant.
November 1994	GPM Gas Corporation (GPM) acquired ownership and operation of the Linam Ranch Plant (formerly Hobbs Gas Plant) from ENRON.
February 23, 1995	GPM submitted a subsurface investigation work plan to the OCD to address the groundwater conditions at Linam Ranch Plant.
April 5, 1995	The OCD approved the subsurface investigation work plan.
May 10-13, 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 five monitoring wells (MW-10D, MW-10, MW-11, MW-12, and MW-13) and two soil borings (SB-1 and SB-2).
September 18, 1995	GPM submitted the *Subsurface Investigation and Preliminary Remedial Response* report for the Linam Ranch Plant to the OCD.
October 19, 1995	The OCD approved GPM's recommendations for remedial action which included a quarterly sampling and monitoring program.
November 14, 1995	GCL conducted the fourth quarter 1995 sampling event at Linam Ranch Plant.
January 17, 1996	GCL conducted the first quarter 1996 sampling event at Linam Ranch Plant.
April 24, 1996	GCL conducted the annual (second quarter 1996) sampling event at Linam Ranch Plant. The annual report included recommendations to the OCD for continued monitoring on a semi-annual basis.
January 22, 1997	BDM (formerly GCL) conducted the first quarter 1997 sampling event.
August 15, 1997	BDM conducted the annual (third quarter 1997) sampling event.

3.0 Procedures

Prior to sampling, the on-site monitoring wells (MW-9 through MW-13) were gauged for depth to groundwater using a Solinst Model 101 electronic water level probe. Immediately prior to collecting groundwater samples, each 4-inch diameter monitoring well (MW-10, MW-11, MW-12, and MW-13) was purged using a decontaminated 2-inch diameter submersible pump (Grundfos Redi-Flo2). The 2-inch diameter monitoring wells (MW-9 and MW-10D) were purged by using a clean, decontaminated bailer. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen (DO) were measured during and after purging using a Hydac Model 910 pH/conductivity meter and a YSI Model 51B DO meter. Groundwater samples were obtained using a new, decontaminated, disposable bailer for each well after purging. Groundwater samples were collected after these parameters stabilized. A total of 343 gallons of water was purged from monitoring wells MW-9 through MW-13 during the January 22, 1997 and August 15, 1997 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 benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020. A duplicate sample of MW-11 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 15, 1997, a third and fourth set of water samples were transferred into appropriately preserved containers for analysis of major ions and WQCC metals. A summary of purging and sampling methods is provided in Table 2 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-9	1/22/97	Bailer	3	Disposable bailer	BTEX and Bio-indicators
	8/15/97	Bailer	5	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10	1/22/97	Bailer	15	Disposable bailer	BTEX and Bio-indicators
	8/15/97	Bailer	50	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-10D	1/22/97	Bailer	5	Disposable bailer	BTEX and Bio-indicators
	8/15/97	Bailer	57	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-11	1/22/97	Bailer	15	Disposable bailer	BTEX and Bio-indicators
	8/15/97	Bailer	55	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-12	1/22/97	Bailer	12	Disposable bailer	BTEX and Bio-indicators
	8/15/97	Bailer	51	Disposable bailer	BTEX, Metals, Ions, Bio-indicators
MW-13	1/22/97	Bailer	15	Disposable bailer	BTEX and Bio-indicators
	8/15/97	Bailer	54	Disposable bailer	BTEX, Metals, Ions, Bio-indicators

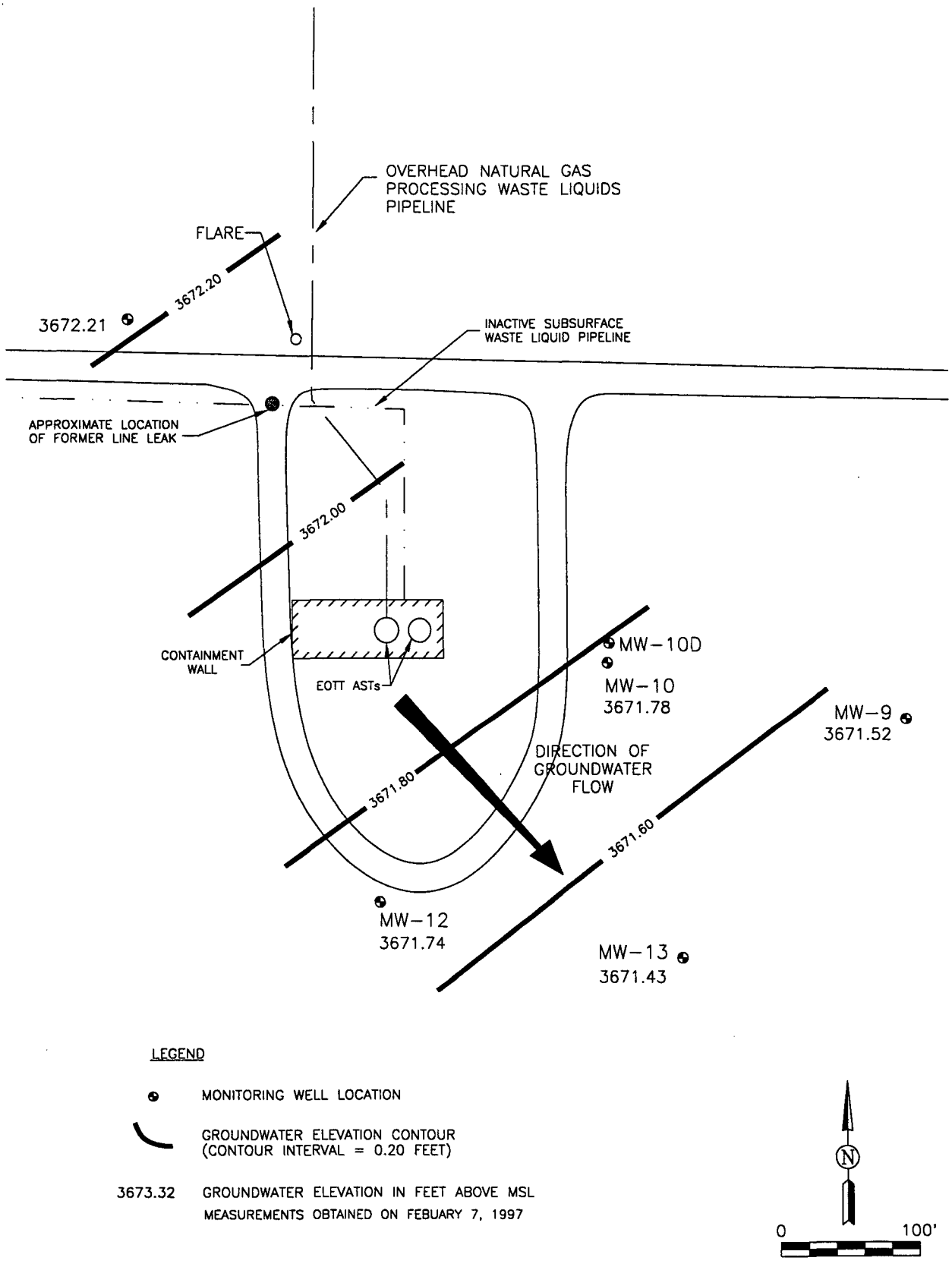
BTEX - benzene, toluene, ethylbenzene, xylenes
WQCC Metals - Ag, Al, As, B, Ba, Cd, Co, Cu, Cr, Fe, Hg, Pb, Mn, Mo, Ni, Se, and Zn
Major ions - TDS, Ca, Na, Mg, F, Cl, HCO_3, SO_4
Bio-indicators - DO, NO3, SO4

4.0 Groundwater Elevations, Hydraulic Gradient and Flow Direction

Based on the most recent gauging data collected by BDM on August 15, 1997, the groundwater conditions at the Linam Ranch Plant are characterized below.

- The depth to the water table is approximately 49 feet below ground surface in the site area.
- The hydraulic gradient is approximately 0.001 feet/foot.
- The direction of groundwater flow is to the southeast.
- The water table elevation has continued to decline and is approximately 1.7 feet lower than in January 1996.

The direction of groundwater flow and hydraulic gradient have remained consistent for the past two 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 1997 sampling events are presented in Figure 1a (February 7, 1997) and Figure 1b (August 15, 1997). Figure 2 depicts the changes in groundwater elevations with time. Historical groundwater elevations and depth to water measurements are summarized in Table 2.



LEGEND

MONITORING WELL LOCATION

GROUNDWATER ELEVATION CONTOUR (CONTOUR INTERVAL = 0.20 FEET)

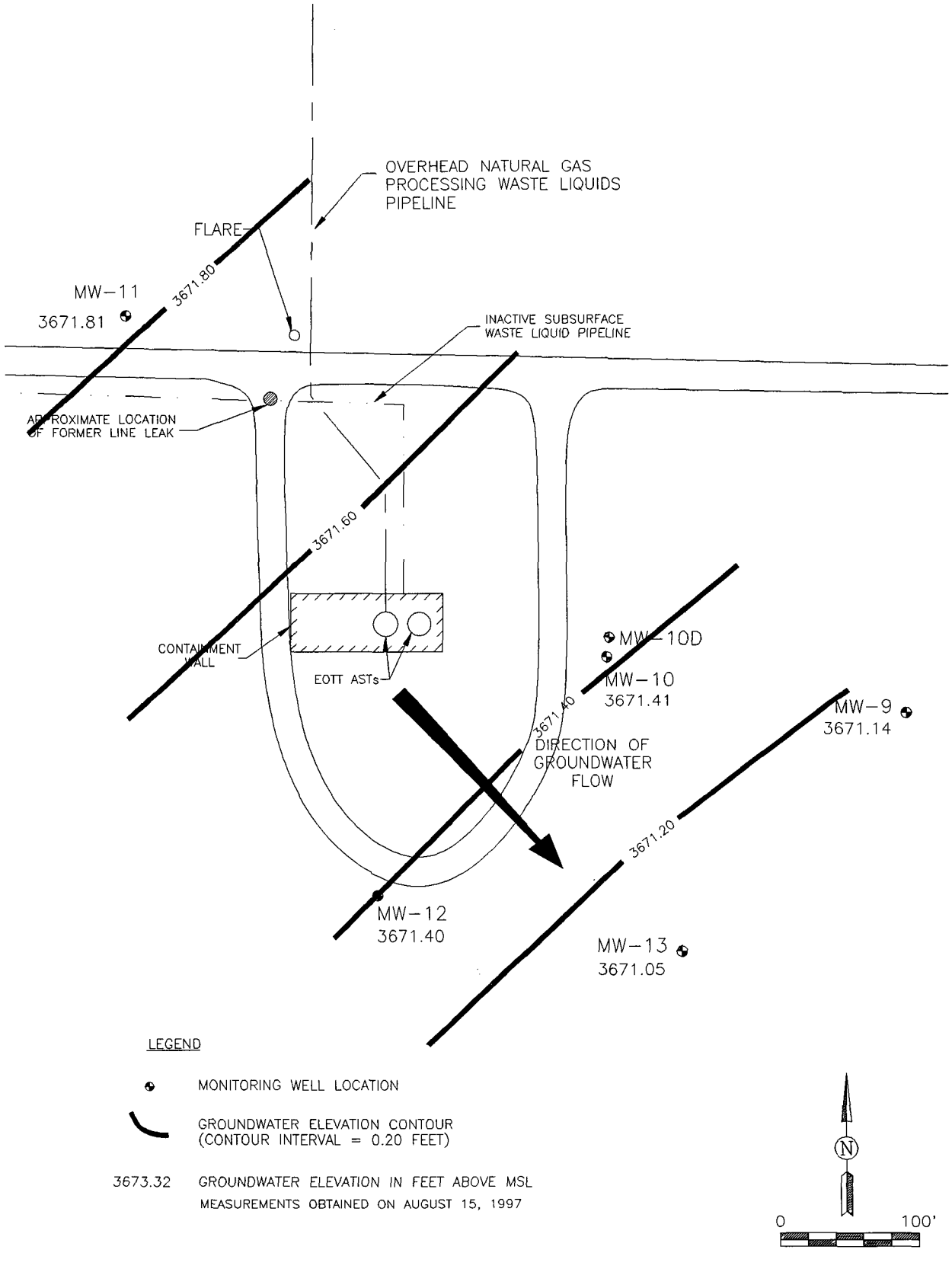
3673.32 GROUNDWATER ELEVATION IN FEET ABOVE MSL MEASUREMENTS OBTAINED ON FEBUARY 7, 1997

D:\P2398\21\GWEL0297

BDM

CLIENT: GPM GAS CORPORATION	
DATE: 2/5/97	REV. NO.: 0
AUTHOR: GJV	DRN BY: FJG
CK'D BY: MWS	FILE: GWEL0297

FIGURE 1a
LINAM RANCH PLANT
GROUNDWATER ELEVATION MAP



CLIENT: GPM GAS CORPORATION		FIGURE 1b LINAM RANCH PLANT GROUNDWATER ELEVATION MAP
DATE:08/15/97	REV. NO.:	
AUTHOR: GJV	DRN BY: DAG	
CK'D BY: MWS	FILE: GWEL0897	

D:\P2398\21\GWEL0897

FIGURE 2

GROUNDWATER ELEVATION VS. TIME

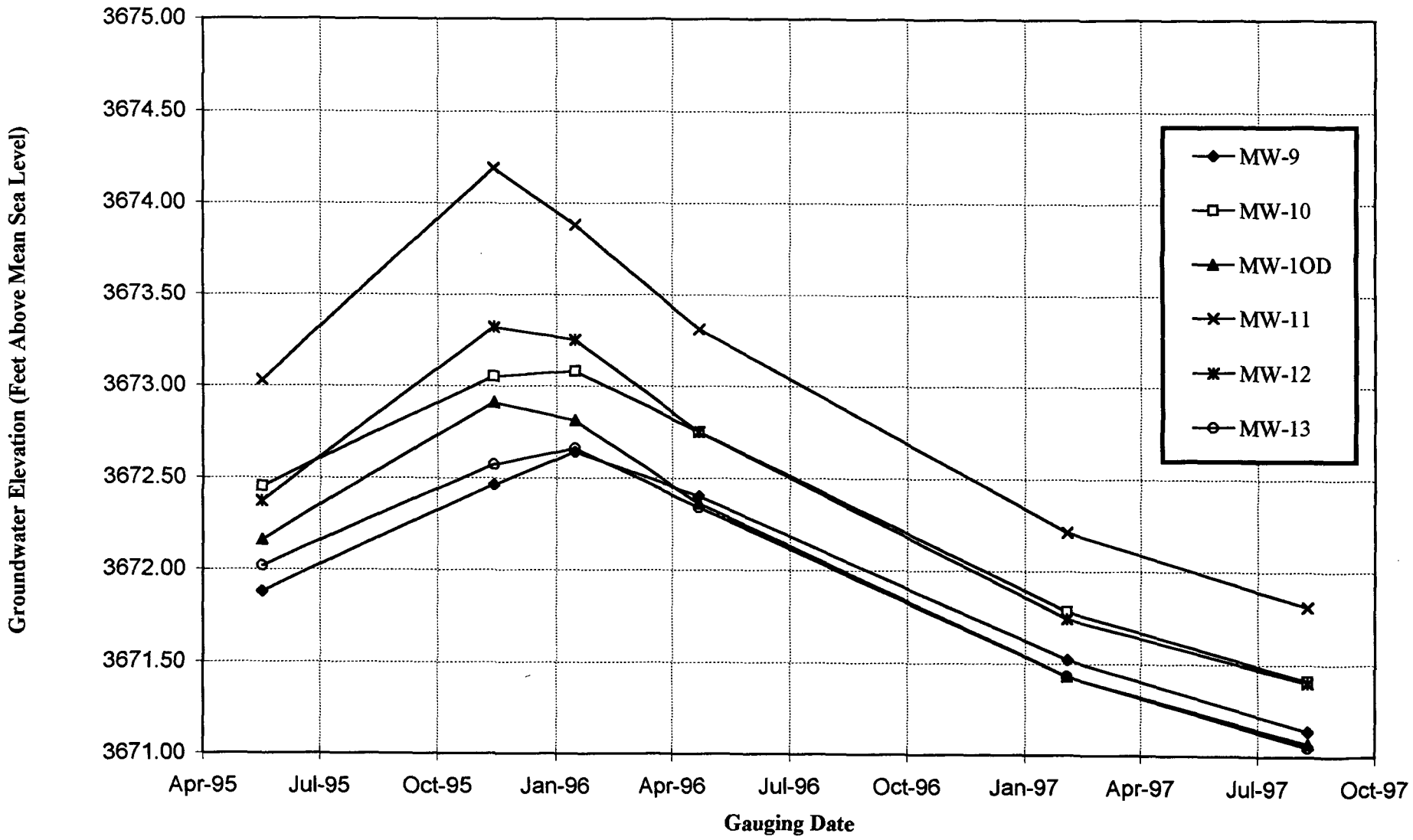


Table 2

Summary of Groundwater Elevations

Linam Ranch Plant - EOTT Tanks

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-9	5/17/95	3720.48	3722.48	50.60	3671.88	0.00
	11/14/95	3720.48	3722.48	50.02	3672.46	0.00
	1/17/96	3720.48	3722.48	49.84	3672.64	0.00
	4/24/96	3720.48	3722.48	50.08	3672.40	0.00
	2/7/97	3720.48	3722.48	50.96	3671.52	0.00
	8/15/97	3720.48	3722.48	51.34	3671.14	0.00
MW-10	5/17/95	3720.76	3722.90	50.45	3672.45	0.00
	11/14/95	3720.76	3722.90	49.85	3673.05	0.00
	1/17/96	3720.76	3722.90	49.82	3673.08	0.00
	4/24/96	3720.76	3722.90	50.15	3672.75	0.00
	2/7/97	3720.76	3722.90	51.12	3671.78	0.00
	8/15/97	3720.76	3722.90	51.49	3671.41	0.00
MW-10D	5/17/95	3720.85	3723.54	51.38	3672.16	0.00
	11/14/95	3720.85	3723.54	50.63	3672.91	0.00
	1/17/96	3720.85	3723.54	50.73	3672.81	0.00
	4/24/96	3720.85	3723.54	51.18	3672.36	0.00
	2/7/97	3720.85	3723.54	52.11	3671.43	0.00
	8/15/97	3720.85	3723.54	52.47	3671.07	0.00
MW-11	5/17/95	3722.02	3724.53	51.50	3673.03	0.00
	11/14/95	3722.02	3724.53	50.34	3674.19	0.00
	1/17/96	3722.02	3724.53	50.65	3673.88	0.00
	4/24/96	3722.02	3724.53	51.22	3673.31	0.00
	2/7/97	3722.02	3724.53	52.32	3672.21	0.00
	8/15/97	3722.02	3724.53	52.72	3671.81	0.00
MW-12	5/17/95	3720.60	3722.84	50.47	3672.37	0.00
	11/14/95	3720.60	3722.84	49.52	3673.32	0.00
	1/17/96	3720.60	3722.84	49.59	3673.25	0.00
	4/24/96	3720.60	3722.84	50.09	3672.75	0.00
	2/7/97	3720.60	3722.84	51.10	3671.74	0.00
	8/15/97	3720.60	3722.84	51.44	3671.40	0.00
MW-13	5/17/95	3721.63	3723.99	51.97	3672.02	0.00
	11/14/95	3721.63	3723.99	51.42	3672.57	0.00
	1/17/96	3721.63	3723.99	51.33	3672.66	0.00
	4/24/96	3721.63	3723.99	51.65	3672.34	0.00
	2/7/97	3721.63	3723.99	52.56	3671.43	0.00
	8/15/97	3721.63	3723.99	52.94	3671.05	0.00

* Elevations 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 direction is to the southeast with a hydraulic gradient of approximately 0.0012 feet/foot.

5.0 Groundwater Quality Conditions

5.1 Distribution of Hydrocarbons in Groundwater

A historical listing of benzene, toluene, ethylbenzene and xylene (BTEX) concentrations obtained from the on site monitoring wells is summarized in Table 3. Hydrocarbon concentration maps depicting the BTEX concentrations for the two 1997 sampling events are presented in Figure 3a (January 22, 1997) and Figure 3b (August 15, 1997). Figure 4 depicts benzene concentrations in groundwater from May 1995 to August 15, 1997 for the on site monitoring wells.

Based on the analytical results for samples collected by BDM on January 22, 1997 and August 15, 1997, the distribution of hydrocarbons at the Linam Ranch Plant is described below.

- BTEX concentrations in monitoring wells MW-9 and MW-12 were at below the laboratory detection limits and below New Mexico Water Quality Control Commission (WQCC) standards for each constituent.
- Benzene concentrations in MW-10, MW-10D, MW-11, and MW-13 exceed the WQCC standard of 0.001 mg/L.
- Toluene and xylene concentrations in MW-10 exceed the WQCC standards of 0.75 mg/l and 0.62 mg/l, respectively.
- Benzene concentrations in MW-10, MW-10D, and MW-11 have declined since the April 24, 1996 sampling event.
- Benzene concentrations in MW-13 have increased from less than 0.001 mg/L during the April 24, 1996 sampling event to 0.132 mg/L during the August 15, 1997 sampling event.
- The benzene increase in MW-13 and concurrent decrease in MW-10, MW-10D and MW-11 indicates a minor movement of the dissolved hydrocarbon plume in the downgradient direction.

5.2 Distribution of Dissolved Metals and Major Ions in Groundwater

Historical groundwater sample analytical results for New Mexico Water Quality Control Commission (WQCC) metals and major ions are presented in Tables 3 and 4, 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.

As with the 1996 annual sampling event, the WQCC metal results for the 1997 annual sampling event indicate no constituents exceeded the WQCC standards with the exception of manganese in MW-10.

The elevated levels of manganese in MW-10 (0.63 mg/l), 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 resulting in higher concentrations. In contrast, non-impacted wells MW-9, MW-12, and MW-13 have no detectable concentrations of manganese. Based on the results of the metal analyses during the annual sampling event the groundwater in the site area is not adversely affected or impacted with dissolved metals.

The major cation and anion analyses for the annual 1997 sampling event indicate no constituents exceeded the WQCC standards with the exception of those listed below:

Total Dissolved Solids:	MW-9 (1,600 mg/l), MW-10 (1,300 mg/l), MW-11 (1,200 mg/l), and MW-12 (1,600 mg/l)
Chloride:	MW-12 (320 mg/l)
Nitrate:	MW-11 (40 mg/l)

The minor exceedance of the total dissolved solids (TDS) and chloride concentrations over the WQCC standards of 1,000 mg/l and 250 mg/l, respectively, do not represent a significant risk to human health. Nitrate is commonly generated from fertilizing or septic sources, however, no such operations are known to exist in the area of the EOTT tanks. Since the groundwater is not extracted from the EOTT area of the gas plant, a level of 40 mg/l does not represent a significant risk to human health. Furthermore, nitrate is an electron acceptor, therefore its presence in upgradient monitoring well MW-11 may actually enhance the intrinsic biodegradation of the dissolved hydrocarbon plume.

Table 3

Summary of Dissolved BTEX Concentrations

Linam Ranch Plant - EOTT Tanks

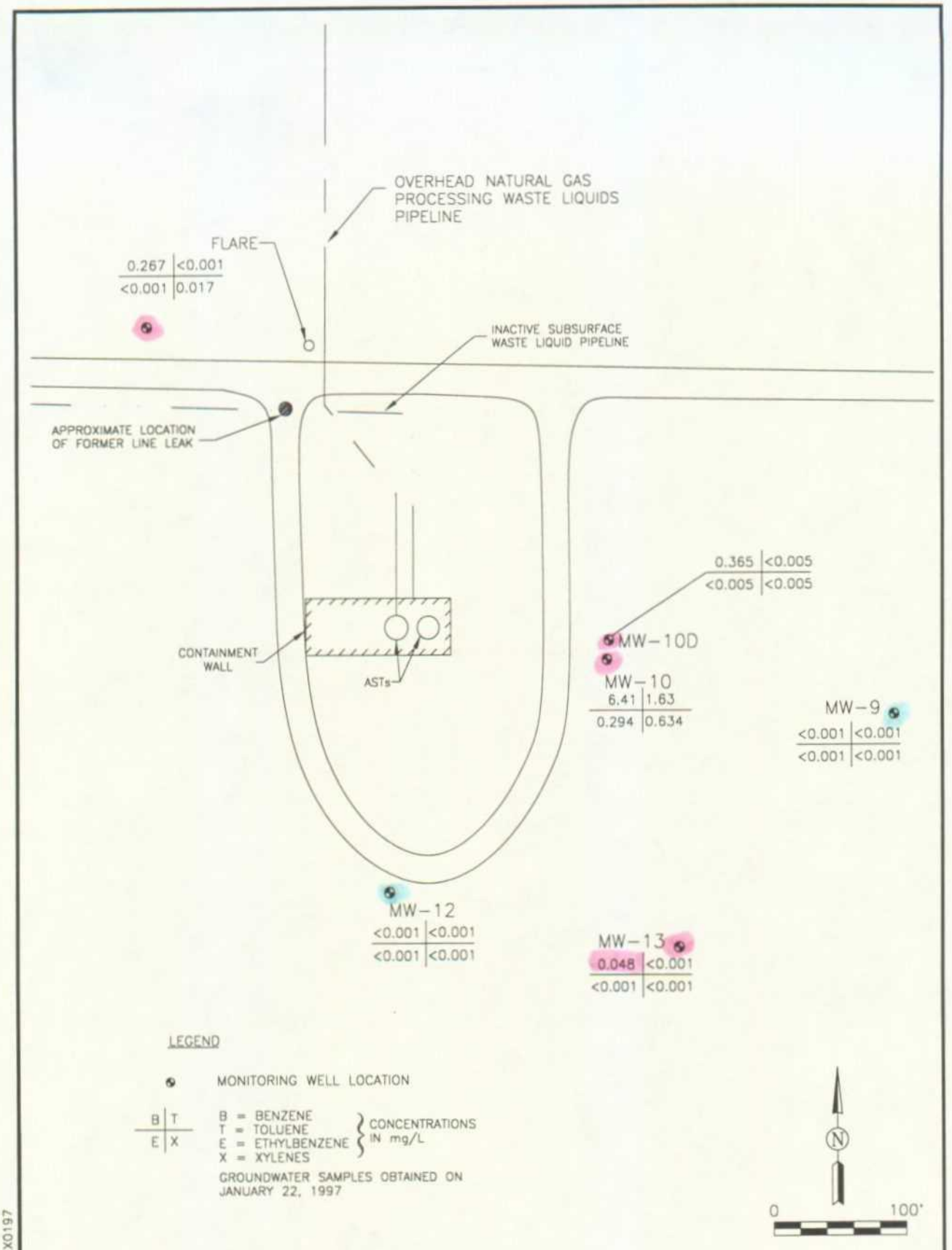
Monitoring Well	Sampling Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)
MW-9	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	< 0.001	< 0.001	< 0.001	< 0.001
	1/17/96	0.001	< 0.001	< 0.001	0.001
	4/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	1/22/97	< 0.001	< 0.001	< 0.001	< 0.001
	8/15/97	< 0.001	< 0.001	< 0.001	< 0.001
MW-10	5/17/95	**3.225**	0.052	0.049	0.169
	11/14/95	**5.230**	0.001	< 0.001	0.406
	1/17/96	**6.110**	**0.863**	**1.140**	**1.050**
	4/24/96	**6.940**	< 0.010	**1.190**	0.127
	1/22/97	**6.41**	**1.63**	0.294	**8.97**
	8/15/97	**5.63**	**1.35**	0.479	**0.453**
MW-10D	5/17/95	**0.096**	0.004	< 0.001	0.008
	11/14/95	**0.125**	0.001	< 0.001	0.011
	1/17/96	**0.841**	0.001	< 0.001	0.047
	4/24/96	**8.140**	0.046	**1.170**	0.076
	1/22/97	**0.365**	< 0.005	< 0.005	< 0.005
	8/15/97	**0.221**	<0.01	<0.01	<0.01
MW-11	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	**0.306**	< 0.001	< 0.001	0.013
	1/17/96	**0.549**	0.004	0.002	0.031
	4/24/96	**0.520**	< 0.002	< 0.002	< 0.002
	1/22/97	**0.267**	< 0.001	< 0.001	0.017
	8/15/97	**0.164**	<0.001	0.002	0.007
MW-12	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	< 0.001	< 0.001	< 0.001	< 0.001
	1/17/96	< 0.001	< 0.001	< 0.001	< 0.001
	4/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	1/22/97	< 0.001	< 0.001	< 0.001	< 0.001
	8/15/97	0.001	<0.001	<0.001	<0.001
MW-13	5/17/95	< 0.001	< 0.001	< 0.001	< 0.001
	11/14/95	0.003	< 0.001	0.001	< 0.001
	1/17/96	< 0.001	< 0.001	< 0.001	< 0.001
	4/24/96	< 0.001	< 0.001	< 0.001	< 0.001
	1/22/97	**0.048**	< 0.001	< 0.001	< 0.001
	8/15/97	**0.132**	<0.001	<0.001	0.01
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 17, 1995 (EPA Method 8240).

New Mexico Water Quality Control Commission (WQCC) standards are listed as specified in Section 3-103.

Values in **boldface** type indicate concentrations exceed WQCC groundwater standards

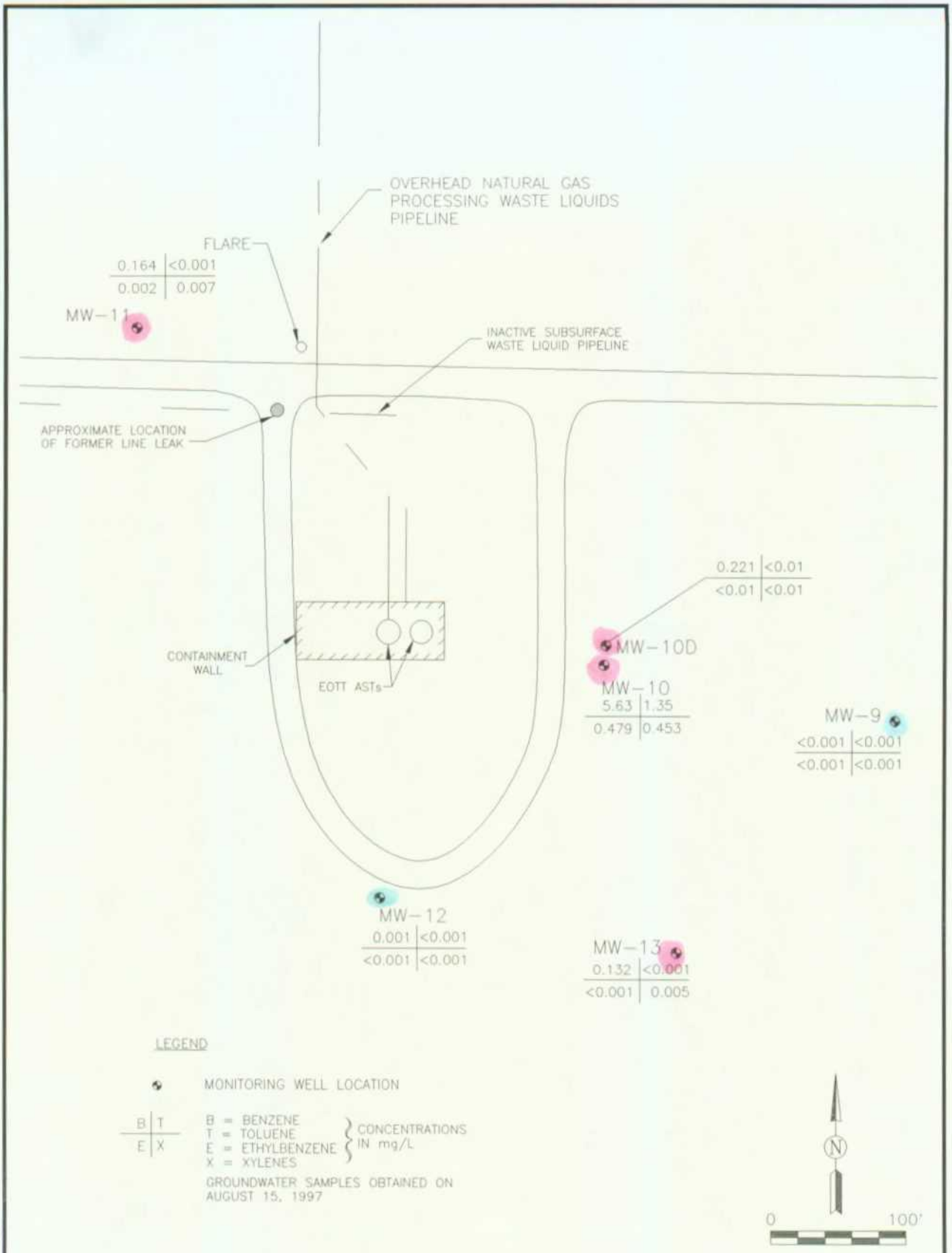


BDM

CLIENT: GPM GAS CORPORATION	
DATE: 2/5/97	REV. NO.: 0
AUTHOR: GJV	DRN BY: FJG
CK'D BY: MWS	FILE: BTEX0197

FIGURE 3a
LINAM RANCH PLANT
BTEX CONCENTRATION MAP

D:\P2398\21\BTEX0197



BDM	CLIENT: GPM GAS CORPORATION	FIGURE 3b LINAM RANCH PLANT BTEX CONCENTRATION MAP
	DATE: 08/15/97 | REV. NO.:	
	AUTHOR: GJV | DRN BY: DAG	
	CK'D BY: MWS | FILE: BTEX0897	

D:\P2398\21\BTEX0897

FIGURE 4

BENZENE CONCENTRATIONS VERSUS TIME

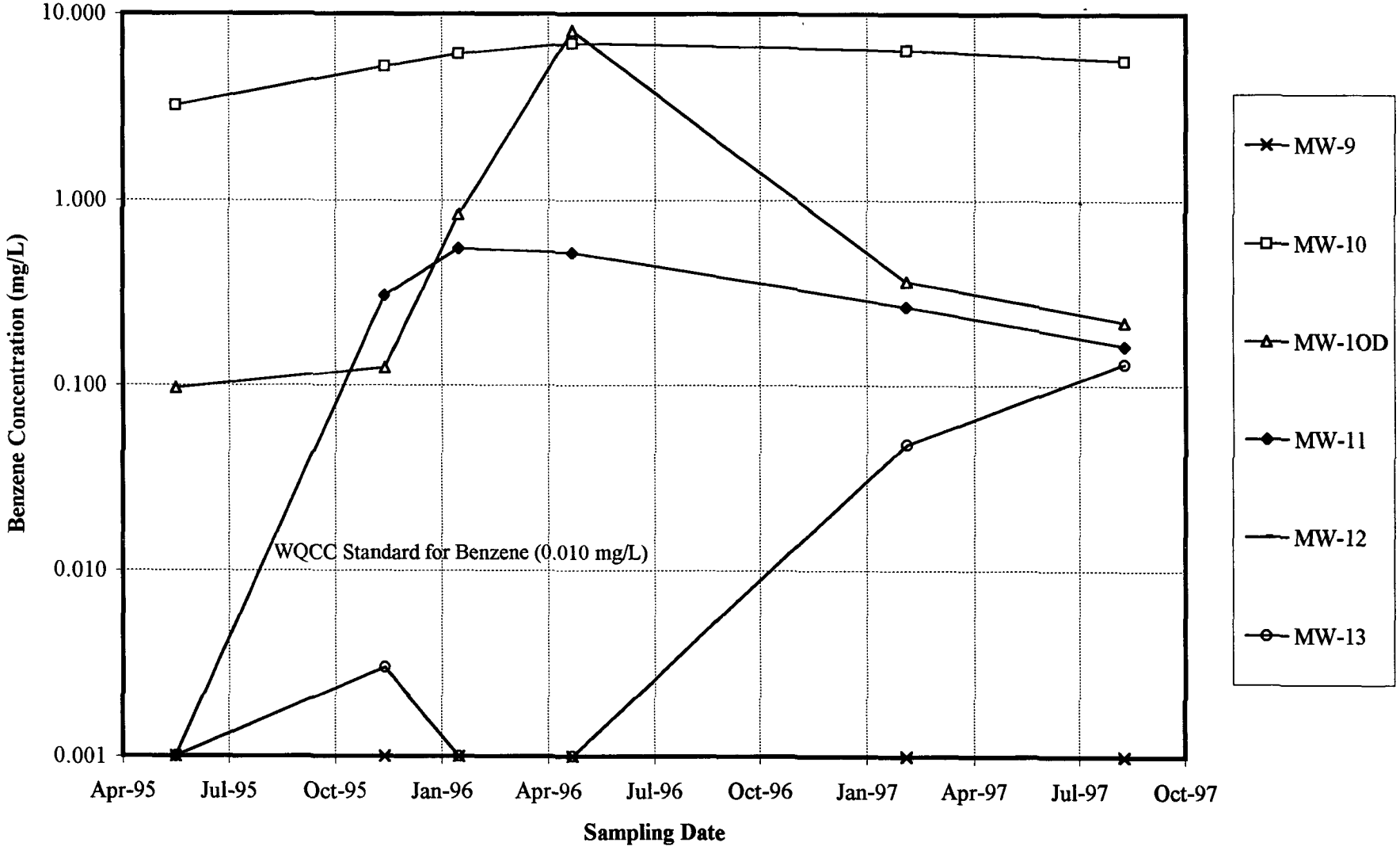


FIGURE 5

BTEX CONCENTRATIONS VS. TIME (MW-10)

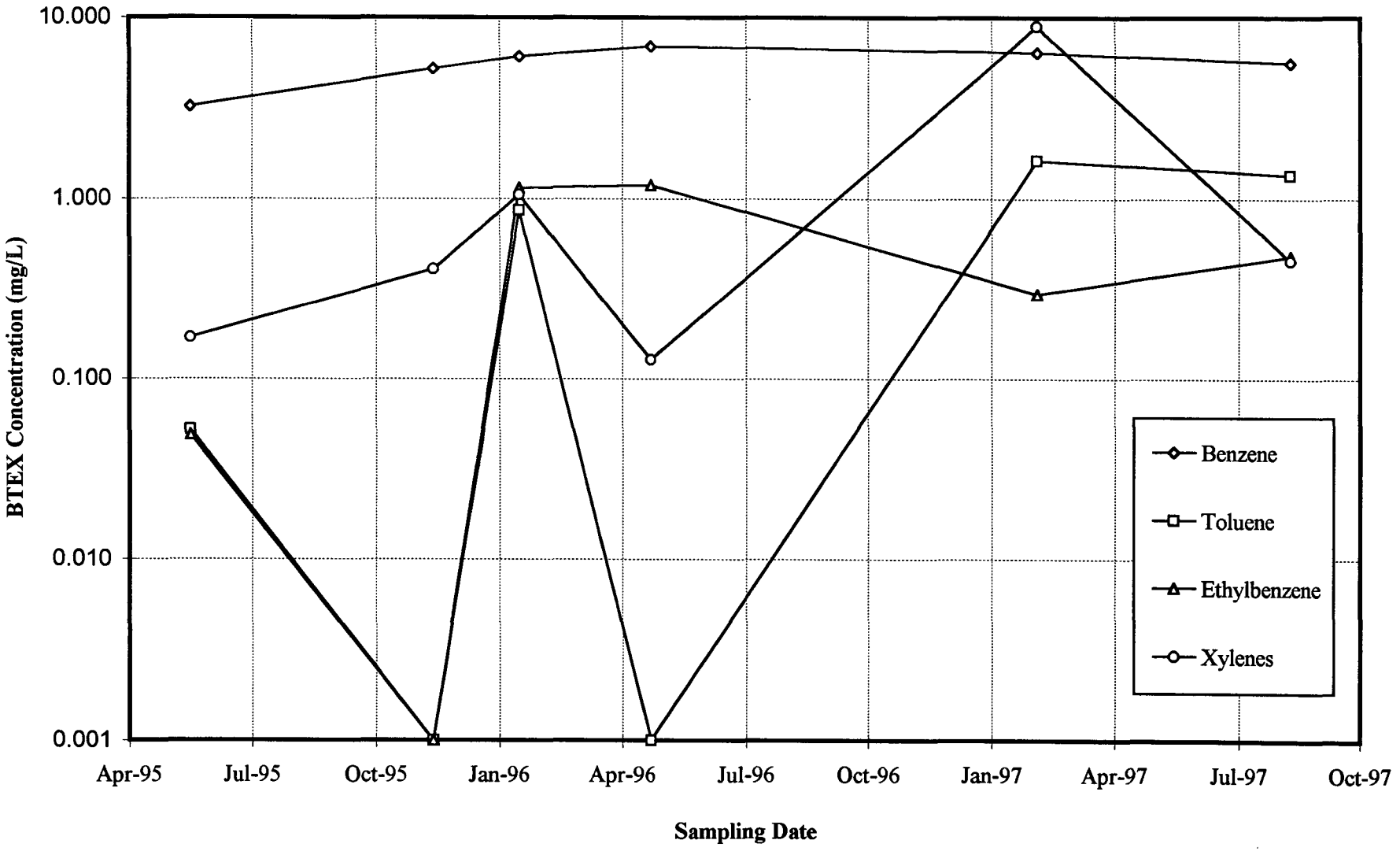


FIGURE 6

BTEX CONCENTRATIONS VS. TIME (MW-10D)

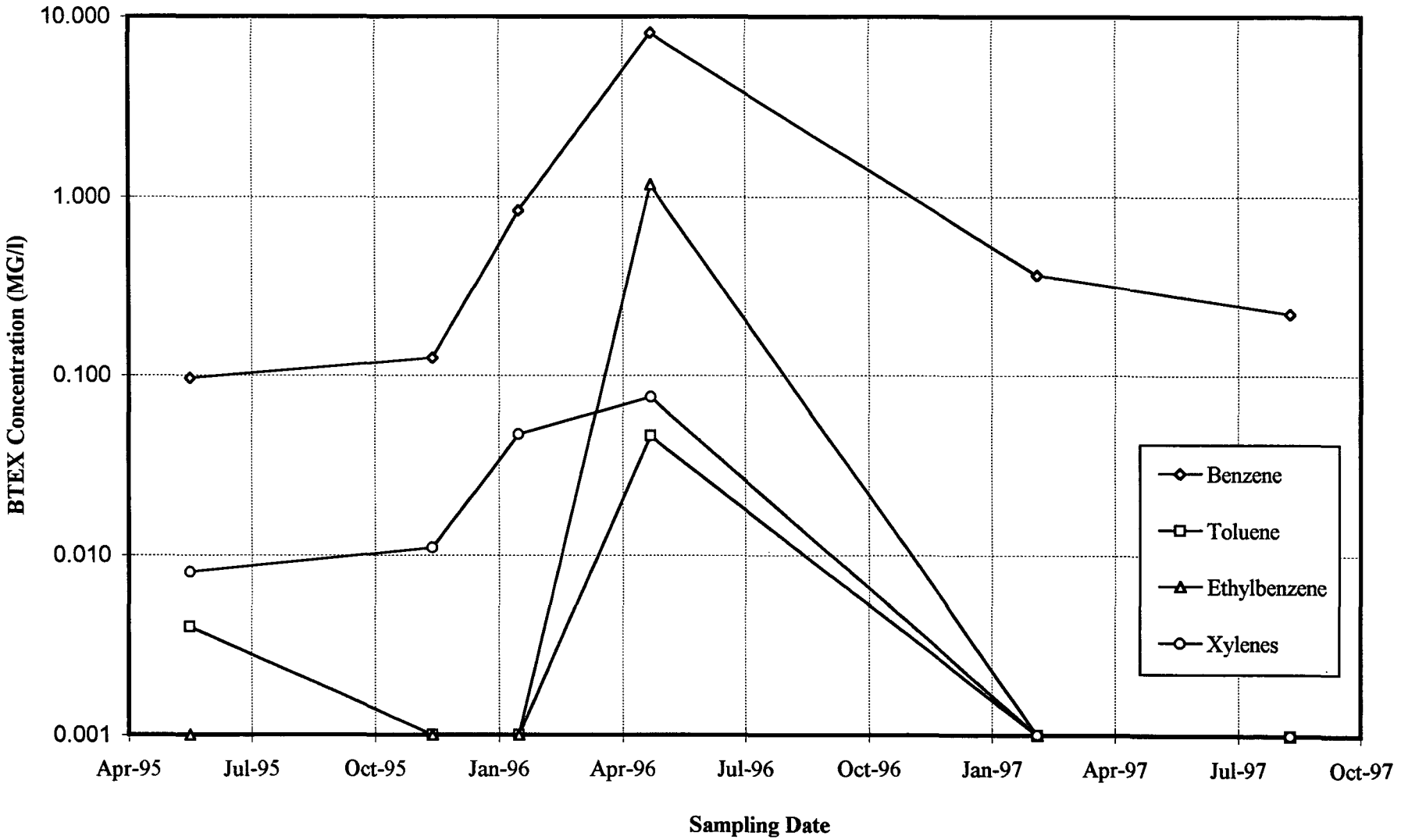


Table 4
Summary of Metal Analytical Results
Linam Ranch Plant - EOTT Tanks

Constituent	Date	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	WQCC Standards (mg/l)
Aluminum (Al)	05-17-95	**26.58**	4.79	3.99	2.14	**5.35**	**14.08**	5.0
	04-24-96	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	08-11-97	0.50	<0.2	<0.2	<0.2	<0.2	<0.2	
Arsenic (As)	05-17-95	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
	04-24-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	08-15-97	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Barium (Ba)	05-17-95	0.30	0.18	0.17	0.10	0.13	0.59	1.0
	04-24-96	<0.2	0.5	<0.2	<0.2	<0.2	0.2	
	08-15-97	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Boron (B)	05-17-95	0.20	0.16	0.10	0.33	0.16	0.16	0.75
	04-24-96	<0.03	0.04	<0.03	0.08	0.09	<0.03	
	08-15-97	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	
Cadmium (Cd)	05-17-95	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01
	04-24-96	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
	08-15-97	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Cobalt (Co)	05-17-95	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
	04-24-96	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
	08-15-97	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Copper (Cu)	05-17-95	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.0
	04-24-96	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	
	08-15-97	0.02	0.03	<0.02	0.04	<0.02	<0.02	
Chromium (Cr)	05-17-95	**0.06**	0.02	0.02	0.05	0.03	<0.01	0.05
	04-24-96	<0.05	<0.05	<0.05	<0.03	<0.05	<0.05	
	08-15-97	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Iron (Fe)	05-17-95	**12.08**	**3.05**	**2.88**	**1.34**	**2.80**	**7.02**	1.0
	04-24-96	<0.03	0.26	0.22	0.13	<0.03	<0.03	
	08-15-97	0.91	0.61	0.39	0.11	0.48	0.24	
Lead (Pb)	05-17-95	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.05
	04-24-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	08-15-97	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Manganese (Mn)	05-17-95	0.15	**0.41**	**0.25**	0.15	0.07	0.11	0.2
	04-24-96	<0.01	**0.93**	0.17	0.08	<0.01	<0.01	
	08-15-97	<0.01	**0.63**	0.20	0.17	0.05	0.01	
Mercury (Hg)	05-17-95	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
	04-24-96	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	
	08-15-97	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	
Molybdenum (Mo)	05-17-95	<0.05	0.06	0.08	0.06	0.06	0.07	1.0
	04-24-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	08-15-97	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Nickel (Ni)	05-17-95	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.2
	04-24-96	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
	08-15-97	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Selenium (Se)	05-17-95	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.05
	04-24-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
	08-15-97	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Silver (Ag)	05-17-95	<0.01	<0.01	<0.01	<0.01	<0.01	**0.18**	0.05
	04-24-96	<0.01	0.01	<0.01	0.02	<0.01	<0.01	
	08-15-97	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc (Zn)	05-17-95	0.07	0.07	0.04	0.06	0.04	0.05	10.0
	04-24-96	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
	08-15-97	0.04	0.58	<0.02	<0.02	0.03	0.05	

Analyses performed by Trace Analysis, Inc. using EPA Methods 200.7, 239.2, 270.2, and 272.2
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metals.
Samples were filtered with a 45 mm element on 04-24-96 and 08-15-97, therefore results indicate total dissolved metals.

Table 5
Summary of Major Ion Analytical Results
Linam Ranch Plant - EOTT Tanks

Constituent	Date	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	WQCC Standards (mg/l)
Total Dissolved Solids (TDS)	05-17-95	602	903	707	890	**1,128**	629	1,000
	04-24-96	579	909	861	963	736	667	
	08-15-97	**1,600**	**1,300**	910	**1,200**	**1,600**	930	
Calcium (Ca)	05-17-95	162	217	171	249	274	158	NS
	04-24-96	101	117	131	133	122	117	
	08-15-97	140	270	190	280	360	200	
Fluoride (F)	05-17-95	0.5	0.7	0.6	0.5	0.7	0.6	1.6
	04-24-96	0.57	0.62	0.67	0.47	0.59	0.50	
	08-15-97	0.52	0.51	0.44	0.46	0.48	0.48	
Magnesium (Mg)	05-17-95	18.2	37.6	22.0	26.8	37.2	20.3	NS
	04-24-96	12.3	29.9	20.7	21.7	18.7	17.2	
	08-15-97	12.0	35.0	22.0	22.0	32.0	17.0	
Sodium (Na)	05-17-95	52.7	89.2	61.4	71.5	132.2	68.9	NS
	04-24-96	44.2	118	59.0	110	59.3	48.8	
	08-15-97	41.0	99.0	52.0	61.0	130.0	42.0	
Bicarbonate (HCO_3)	05-17-95	283	414	303	419	494	277	NS
	04-24-96	286	660	648	553	420	330	
	08-15-97	410	530	300	430	690	290	
Chloride (Cl)	05-17-95	73	98	59	49	225	137	250
	04-24-96	58	72	72	28	91	96	
	08-15-97	57	120	78	39	**320**	190	
Nitrate (NO_3-N)	05-17-95	4.7	1.03	0.63	**28.6**	1.01	5.0	10.0
	04-24-96	0.2	<0.1	<0.1	1.9	<0.1	0.2	
	08-15-97	3.4	<1.0	<1.0	**40**	<1.0	4.5	
Sulfate (SO_4)	05-17-95	126	184	232	190	206	99	600
	04-24-96	60	16	21	124	53	46	
	08-15-97	82	210	180	160	210	78	

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 340.2, 375.4, 353.3, 4500 C1-B, and 310.1
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
NS - Indicates no standard established or applicable.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.
Dissolved oxygen obtained using a YSI Model 51B dissolved oxygen meter or comparable model.

6.0 Intrinsic Bioremediation Assessment

Electron acceptors can be used by in situ microorganisms to achieve significant hydrocarbon degradation, therefore our suite of analytes included dissolved oxygen, (DO), sulfate (SO_4) and nitrate as nitrogen(NO_3). Electron acceptor results (biological parameters) are summarized in Table 6. Changes in dissolved oxygen, nitrate and sulfate concentrations with time are depicted in Figures 5, 6, and 7, respectively.

Hydrocarbon-impacted wells (MW-10, MW-10D, and MW-11) are compared against non-impacted wells (MW-9, MW-12, and MW-13) to observe whether or not significant differences are observed in electron acceptor concentrations that may be related to subsurface biodegradation. The following trends 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.

- An overall increase in dissolved oxygen, nitrate, and sulfate concentrations since April 1996 is evident in all of the monitoring wells which may correlate to a decrease in the use of these receptors by micro-organisms in the course of hydrocarbon degradation.

Since the determination of the presence of an adequate population of total aerobic bacteria and hydrocarbon degrading bacteria has been made, continued monitoring of bacteria populations is not being conducted. This change in procedure was discussed with and approved by Bill Olson (OCD) on February 12, 1997 (personal communication with Gilbert Van Deventer, BDM).

Table 6

Summary of Biological Parameter Results

Linam Ranch Plant - EOTT Tanks

Monitoring Well	Sampling Date	Dissolved Oxygen (mg/L)	Nitrate - NO_3 (mg/L)	Sulfate - SO_4 (mg/L)
MW-9	5/17/95	1.85	4.70	126
	11/14/95	2.82	NA	NA
	1/17/96	5.3	NA	NA
	4/24/96	2.0	0.2	60
	1/22/97	14.6	3.4	71
	8/15/97	3.8	3.4	82
MW-10	5/17/95	1.05	1.030	184
	11/14/95	1.98	< 0.01	174
	1/17/96	5.0	< 0.5	40
	4/24/96	1.6	< 0.1	16
	1/22/97	8.75	< 0.1	25
	8/15/97	2.9	< 1.0	210
MW-10D	5/17/95	0.45	NA	NA
	11/14/95	2.41	NA	NA
	1/17/96	5.0	NA	NA
	4/24/96	1.8	NA	NA
	1/22/97	5.5	< 0.1	210
	8/15/97	1.8	< 1.0	180
MW-11	5/17/95	1.05	28.6	190
	11/14/95	2.30	1.56	184
	1/17/96	2.8	43.3	150
	4/24/96	2.0	1.9	124
	1/22/97	7.0	24	170
	8/15/97	1.8	40	160
MW-12	5/17/95	0.97	1.01	206
	11/14/95	3.15	NA	NA
	1/17/96	1.7	NA	NA
	4/24/96	1.8	< 0.1	53
	1/22/97	11.8	< 0.1	150
	8/15/97	1.9	< 1.0	210
MW-13	5/17/95	1.51	5.00	99
	11/14/95	5.00	0.02	44
	1/17/96	2.0	6.54	42
	4/24/96	2.6	0.2	46
	1/22/97	9.5	5.4	65
	8/15/97	5.1	4.5	78

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

Dissolved oxygen (DO) readings obtained with ICM Model 31250 and YSI Model 51B DO meters.

FIGURE 7

DISSOLVED OXYGEN CONCENTRATIONS VERSUS TIME

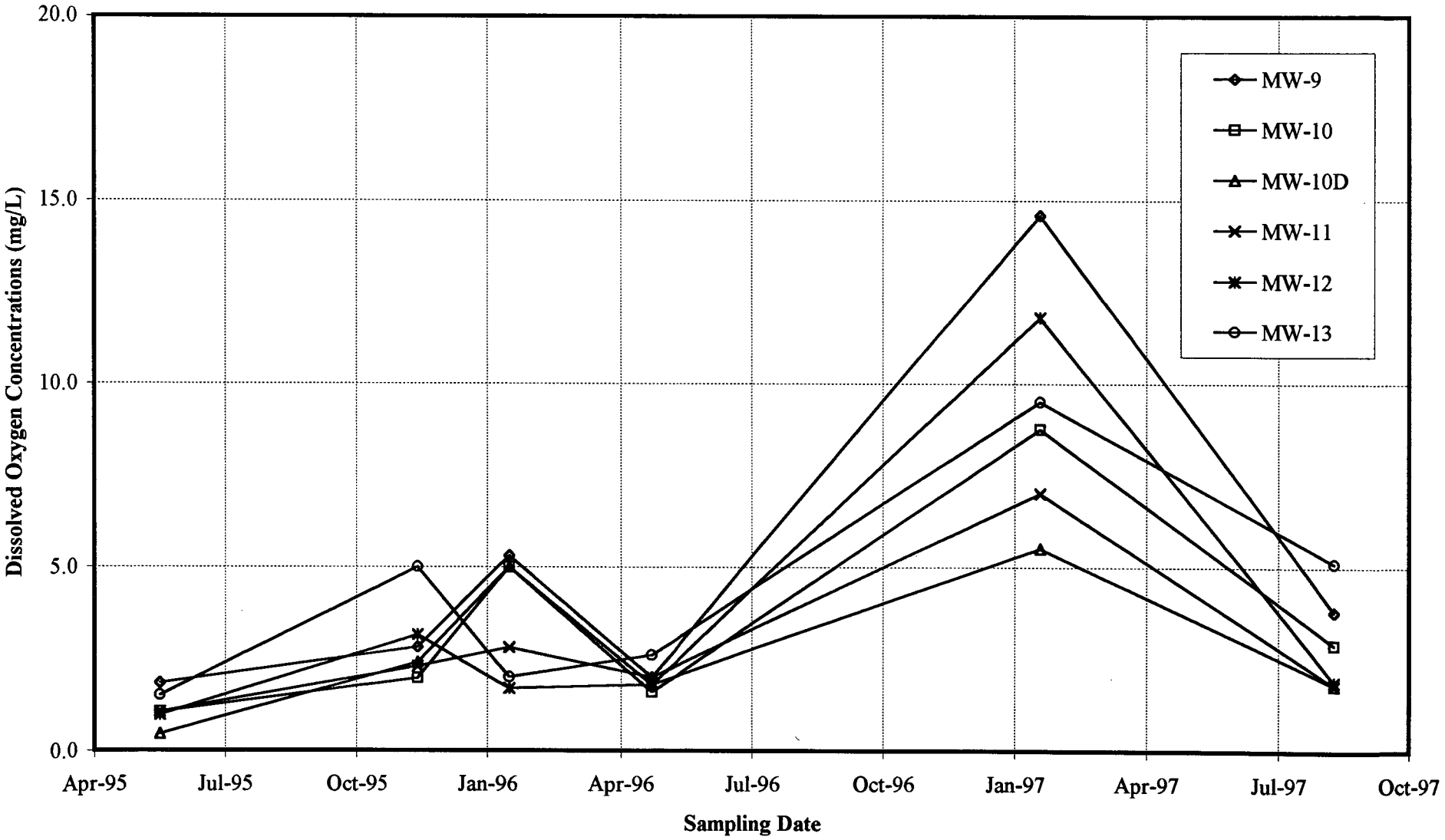


FIGURE 8

NITRATE CONCENTRATIONS VERSUS TIME

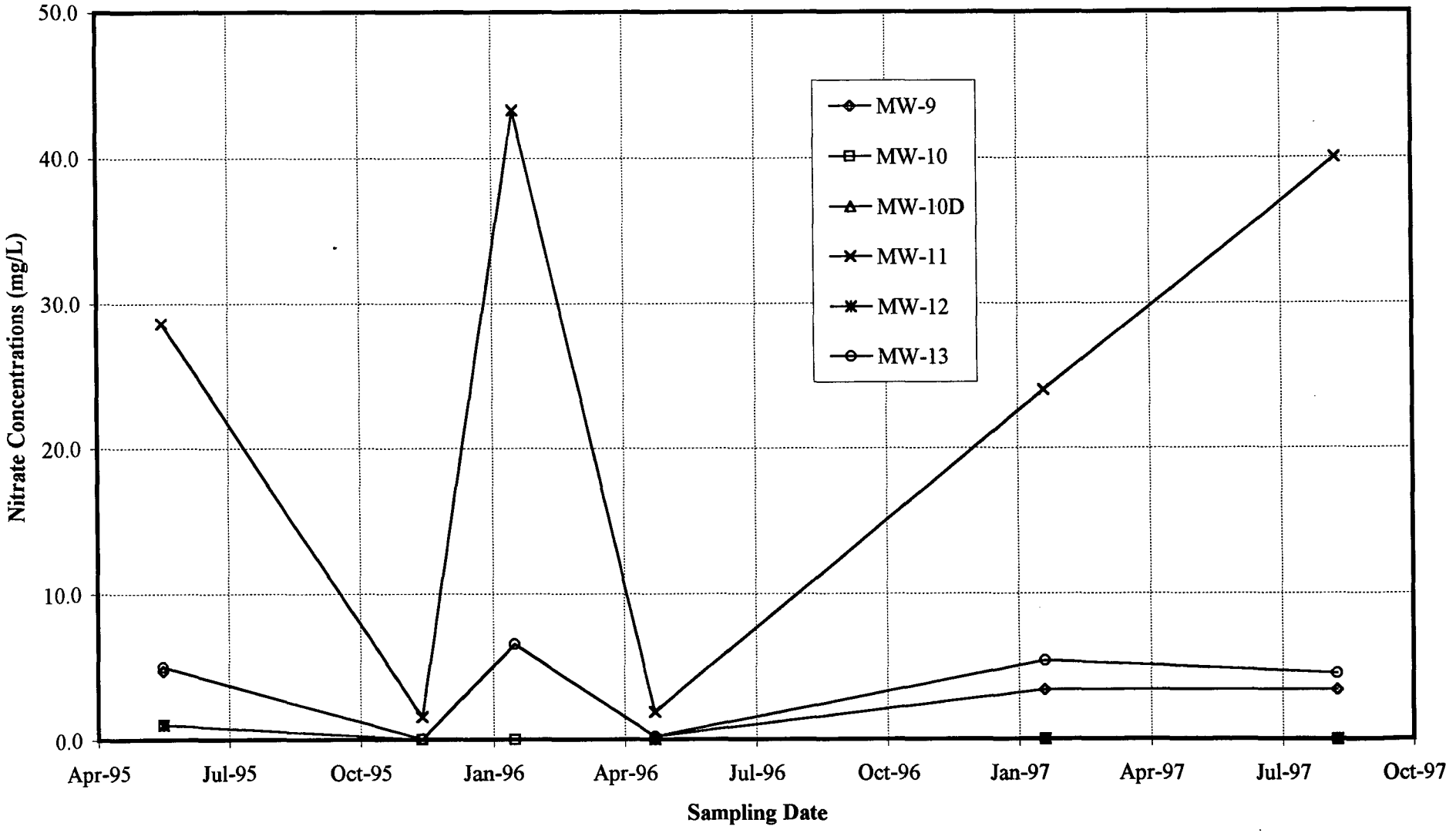
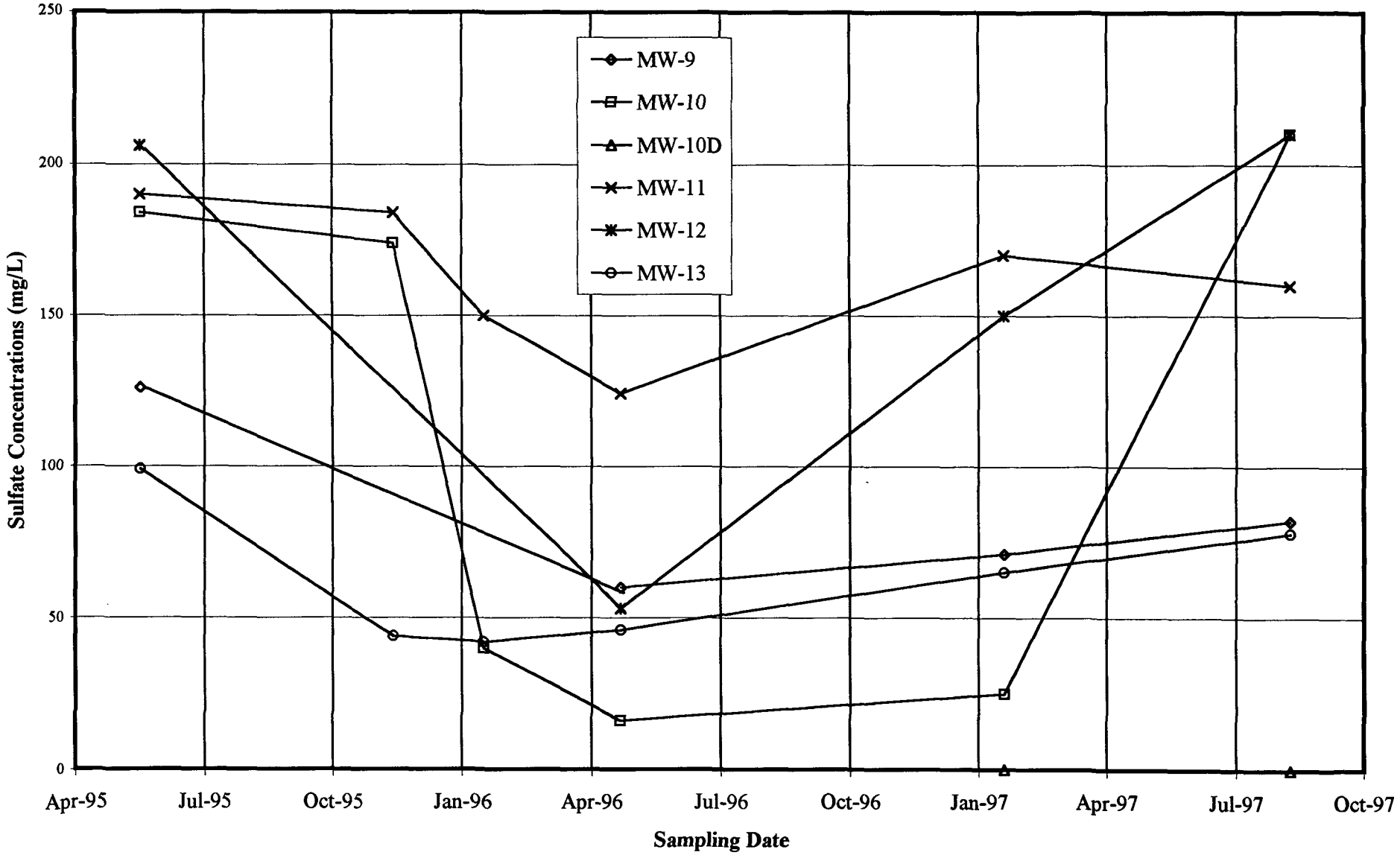


FIGURE 9

SULFATE CONCENTRATIONS VERSUS TIME



7.0 Conclusions

Conclusions relevant to groundwater conditions and the remediation performance at the Linam Ranch Plant are presented below.

- BTEX concentrations in monitoring wells MW-9 and MW-12 were below the laboratory detection limits and New Mexico Water Quality Control Commission (WQCC) standards for each constituent.
- Benzene concentrations in MW-10, MW-10D, MW-11, and MW-13 exceed the WQCC standard of 0.001 mg/L.
- Benzene concentrations in MW-10, MW-10D, and MW-11 have declined since the April 24, 1996 sampling event.
- Benzene concentrations in MW-13 have increased from less than 0.001 mg/L during the April 24, 1996 sampling event to 0.132 mg/L during the August 15, 1997 sampling event.
- The benzene increase in MW-13 and concurrent decrease in MW-10, MW-10D and MW-11 indicates a minor movement of the dissolved hydrocarbon plume in the downgradient direction.
- Continued semi-annual monitoring is necessary to track the movement or steady state condition of the plume and to evaluate the effectiveness of intrinsic bioremediation in limiting the migration or elimination of the dissolved hydrocarbons.
- The dissolved-phase hydrocarbons in groundwater are contained well within the boundaries of the facility.
- Based on the results of the inorganic analyses during the annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals or major ions with the exception of manganese (MW-10), nitrate (MW-11), TDS (MW-9, MW-10, MW11, and MW-12), and chloride (MW-12).

8.0 Recommendations

The following recommendations are proposed for monitoring the groundwater conditions at the Linam Ranch Plant.

- Continue the sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled during the first quarter of 1998.
- Benzene concentrations in downgradient well MW-13 should be monitored closely prior to initiating additional corrective action.
- Since the groundwater is not adversely impacted with inorganic constituents, as reported throughout the previous two years, analysis of dissolved metals and major ions is an unnecessary expense. Further analysis of the WQCC metals and major ions should be discontinued with the exception of manganese, chloride, sulfate, nitrate and TDS.

APPENDIX A

LABORATORY ANALYTICAL REPORTS

AND CHAIN OF CUSTODY DOCUMENTATION

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

ANALYTICAL RESULTS FOR
BDM International
Attention Gil VanDeVenter
415 W. Wall, Suite 1818
Midland TX 79701

Date: Aug 25, 1997
Date Rec: 8/16/97
Project: N/A
Proj Name: GPM-Linam Ranch Plant
Proj Loc: N/A

Lab Receiving # : 9708000316
Sampling Date: 8/15/97
Sample Condition: Intact and Cool
Sample Received By: SA

TA#	Field Code	MATRIX	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	M,P,O XYLENE (mg/L)	TOTAL BTEX (mg/L)
T79800	MW-12	Water	0.001	<0.001	<0.001	<0.001	0.001
T79801	MW-13	Water	0.132	<0.001	<0.001	0.005	0.137
T79802	MW-14D	Water	0.172	<0.001	0.001	0.006	0.179
T79803	MW-11	Water	0.164	<0.001	0.002	0.007	0.173
T79804	MW-9	Water	<0.001	<0.001	<0.001	<0.001	<0.001
T79805	MW-10	Water	5.63	1.35	0.479	0.453	7.91
T79806	MW-10D	Water	0.221	<0.010	<0.010	<0.010	0.221
T79807	Rinsate	Water	0.022	0.003	0.004	0.007	0.036
Method Blank			<0.001	<0.001	<0.001	<0.001	
Reporting Limit			0.001	0.001	0.001	0.001	
QC			0.097	0.100	0.099	0.312	
RPD			1	2	1	2	
% Extraction Accuracy			103	103	103	109	
% Instrument Accuracy			97	100	99	104	

TEST	PREP METHOD	PREP DATE	ANALYSIS METHOD	ANALYSIS COMPLETED	CHEMIST	QC: (mg/L)	SPIKE: (mg/L)
BTEX	EPA 5030	8/20/97	EPA 8020	8/20/97	AG	0.100 ea	0.1 ea

Director, Dr. Blair Leftwich

8-25-97
Date

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

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

September 8, 1997
Receiving Date: 08/16/97
Sample Type: Water
Project No: LREOTT-20-300
Project Location: NA
COC# 13183

Prep Date: 08/18/97
Analysis Date: 08/18/97
Sampling Date: 08/15/97
Sample Condition: Intact & Cool
Sample Received by: SA
Project: GPM-Linam Ranch Plant

TA#	FIELD CODE	CHLORIDE (mg/L)	SULFATE (mg/L)	FLUORIDE (mg/L)	TDS (mg/L)	NITRATE-N (mg/L)	ALKALINITY (mg/L as CaCo3) HC03	C03
T79800	9708150940 MW-12	320	210	0.48	1,600	<1.0	690	<1.0
T79801	9708151035 MW-13	190	78	0.48	930	4.5	290	<1.0
T79803	9708151130 MW-11	39	160	0.46	1,200	40	430	<1.0
T79804	9708151140 MW-9	57	82	0.52	1,600	3.4	410	<1.0
T79805	9708151445 MW-10	120	210	0.51	1,300	<1.0	530	<1.0
T79806	9708151530 MW-10d	78	180	0.44	910	<1.0	300	<1.0
QC	Quality Control	24	25	1.01	---	9.4	---	---
RPD		2	3	1	2	3	2	2
% Extraction Accuracy		98	101	94	---	98	---	---
% Instrument Accuracy		97	100	100	---	97	---	---
REPORTING LIMIT		10	10	0.1	---	1.0	1.0	1.0

METHODS: EPA 300.0, 340.2, 160.1, 310.1.
CHEMIST: CHLORIDE/NITRATE-N/SULFATE: RC FLUORIDE/TDS/ALKALINITY: JS
CHLORIDE SPIKE: 25 mg/L CHLORIDE. CHLORIDE QC: 25 mg/L CHLORID
SULFATE SPIKE: 25 mg/L SULFATE. SULFATE QC: 25 mg/L SULFATE.
FLUORIDE SPIKE: 1.0 mg/L FLUORIDE. FLUORIDE QC: 1.0 mg/L FLUORIDE.
NITRATE-N SPIKE: 10 mg/L NITRATE-N. NITRATE-N QC: 10 mg/L NITRIATE-N.

Director, Dr. Blair Leftwich

9-8-97
Date

TRACEANALYSIS, INC.

6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

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

September 8, 1997
Receiving Date: 08/16/97
Sample Type: Water
Project No: LREOTT-20-300
Project Location: NA
COC# 13183

Prep Date: 08/25/97
Analysis Date: 09/03/97
Sampling Date: 08/15/97
Sample Condition: Intact & Cool
Sample Received by: SA
Project Name: GPM-Linam Ranch Plant

TA#	Field Code	POTASSIUM (mg/L)	MAGNESIUM (mg/L)	CALCIUM (mg/L)	SODIUM (mg/L)
T79800	9708150940 MW-12	4.9	32	360	130
T79801	9708151035 MW-13	3.2	17	200	42
T79803	9708151130 MW-11	3.4	22	280	61
T79804	9708151140 MW-9	2.4	12	140	41
T79805	9708151445 MW-10	2.4	35	270	99
T79806	9708151530 MW-10d	2.4	22	190	52
QC	Quality Control	46	45	49	45
MET BLK	**METHOD BLANK**	**<0.30**	**<0.03**	**<0.05**	**<0.40**
Reporting Limit		0.30	0.01	0.01	0.40
RPD		5	3	7	5
% Extraction Accuracy		100	92	93	110
% Instrument Accuracy		91	90	92	90

METHODS: EPA 200.7.
CHEMIST: RR
SPIKE: 100 mg/L POTASSIUM, MAGNESIUM, CALCIUM, SODIUM.
QC: 50 mg/L POTASSIUM, MAGNESIUM, CALCIUM, SODIUM.

Director, Dr. Blair Leftwich

9-8-97
Date

TRACEANALYSIS, INC.

6701 Aberdeen Avenue Lubbock, Texas 79424 806•794•1296 FAX 806•794•1298

September 11, 1997
Receiving Date: 08/16/97
Sample Type: Water
Project No: LREOTT-20-300
Project Location: NA
COC# 13183

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

Prep Date: 08/15/97
Analysis Date: 08/18/97
Sampling Date: 08/15/97
Sample Condition: Intact & Cool
Sample Received by: SA
Project: GPM-Linam Ranch Plant

DISSOLVED METALS

TA#	FIELD CODE	As (mg/L)	Se (mg/L)	Cd (mg/L)	Cr (mg/L)	Pb (mg/L)	Ag (mg/L)	Ba (mg/L)	Al (mg/L)	Be (mg/L)	U (mg/L)
T79800	9708150940 MW-12	<0.10	<0.05	<0.01	<0.05	<0.05	<0.01	<0.20	<0.20	<0.01	<1.0
T79801	9708151035 MW-13	<0.10	<0.05	<0.01	<0.05	<0.05	<0.01	<0.20	<0.20	<0.01	<1.0
T79803	9708151130 MW-11	<0.10	<0.05	<0.01	<0.05	<0.05	<0.01	<0.20	<0.20	<0.01	<1.0
T79804	9708151140 MW-9	<0.10	<0.05	<0.01	<0.05	<0.05	<0.01	<0.20	0.50	<0.01	<1.0
T79805	9708151445 MW-10	<0.10	<0.05	<0.01	<0.05	<0.05	<0.01	<0.20	<0.20	<0.01	<1.0
T79806	9708151530 MW-10d	<0.10	<0.05	<0.01	<0.05	<0.05	<0.01	<0.20	<0.20	<0.01	<1.0
QC	Quality Control	5.3	5.0	5.2	5.1	5.0	0.99	4.8	4.9	4.5	4.8
HIGH		**10.9 109%	---	**9.4 94%	---	---	---	---	---	**9.26 93%	---
REPORTING LIMIT		0.10	0.05	0.01	0.05	0.05	0.01	0.20	0.20	0.01	1.0
RPD		2	1	1	1	2	2	2	2	0	0
% Extraction Accuracy		98	87	88	85	87	87	76*	82	112	100
% Instrument Accuracy		106	99	103	101	100	99	95	98	91	98

TA#	FIELD CODE	Hg (mg/L)	Co (mg/L)	Cu (mg/L)	Fe (mg/L)	Mn (mg/L)	Mo (mg/L)	Ni (mg/L)	V (mg/L)	Zn (mg/L)	B (mg/L)
T79800	9708150940 MW-12	<0.001	<0.03	<0.02	0.48	0.05	<0.10	<0.20	<0.05	0.03	<0.2
T79801	9708151035 MW-13	0.005	<0.03	<0.02	0.24	0.01	<0.10	<0.20	<0.05	0.05	<0.2
T79803	9708151130 MW-11	<0.001	<0.03	0.04	0.11	0.17	<0.10	<0.20	<0.05	<0.02	<0.2
T79804	9708151140 MW-9	<0.001	<0.03	0.02	0.91	<0.01	<0.10	<0.20	<0.05	0.04	<0.2
T79805	9708151445 MW-10	<0.001	<0.03	0.03	0.61	0.63	<0.10	<0.20	<0.05	0.58	0.3
T79806	9708151530 MW-10d	<0.001	<0.03	<0.02	0.39	0.20	<0.10	<0.20	<0.05	<0.02	<0.2
QC	Quality Control	0.0044	5.3	4.9	5.1	5.1	5.1	5.1	5.0	5.0	5.1
REPORTING LIMIT		0.001	0.03	0.02	0.03	0.01	0.10	0.20	0.05	0.02	0.2
RPD		7	0	0	0	1	0	0	0	1	5
% Extraction Accuracy		89	90	70*	107	83	89	84	83	83	101
% Instrument Accuracy		88	105	97	102	101	102	101	99	100	108

***NOTE: Extraction Accuracy is out of limits of 80-120%.**
****NOTE: High is out of limits of 95-105%.**
METHODS: EPA 200.7, 245.1.
CHEMIST: As, Se, Cd, Cr, Pb, Ag, Ba, Al, Be, Co, Cu, Fe, Mn, Mo, Ni, V, zn: RR U, Hg: HC
DISSOLVED METALS SPIKE: 2.0 mg/L As, Se, Cd, Cr, Pb, Ba, Al, Be, U, Co, Cu, Fe, Mn, Mo, Ni, V, Zn, B; 1.0 mg/L Ag; 0.005 mg/L Hg.
DISSOLVED METALS QC: 5.0 mg/L As, Se, Cd, Cr, Pb, Ba, Al, Be, U, Co, cu, Fe, Mn, Mo, Ni, V, Zn, B; 1.0 mg/L Ag; 0.005 mg/L Hg.

BL 9-11-97

Director, Dr. Blair Leftwich DATE

79800 - 7

316

13183

BDM

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

Chain of Custody

Date 8-15-97 Page 1 Of 1

Lab Name Trace Analysis Inc
Address 6701 Aberdeen Ave.
Lubbock, Tx 79424
Telephone 800 378-1296

Samplers (SIGNATURES) Gil Van Deventer, John Zergerman

Analysis Request

	Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX	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	TPH/BTEX Modified 8015	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)	Dissolved Metals* Ca, Na, Mg, K, TDS, SO_4, Cl, HCO_3, NO_3				Number of Containers
79800	970815 0940	Water	MW-12		✓																					✓	✓	✓		5
79801	970815 1035	Water	MW-13		✓																					✓	✓	✓		5
2	970815 1000	Water	MW-14d		✓																									2
3	970815 1130	Water	MW-11		✓																					✓	✓	✓		5
4	970815 1140	Water	MW-9		✓																					✓	✓	✓		5
5	970815 1445	Water	MW-10		✓																					✓	✓	✓		5
6	970815 1530	Water	MW-10d		✓																					✓	✓	✓		5
7	970815 1540	Water	Rinsate		✓																									2

Project Information	
Project	GPM-Linam Ranch Plant
Project Director	G. Van Deventer
Charge Code No.	LREOTT-20-3007
Shipping ID. No.	155-448-996-0
Via:	TNM&O Bus Greyhound

Sample Receipt	
Total No. of Containers	34
Chain of Custody Seals	yes
Rec'd Good Condition/Cold	3°C
Conforms to Record	yes
Lab No.	797800 - 7

Special Instructions/Comments: *Dissolved metals: Al, Ag, As, Ba, B, Cd, Co, Cu, Cr, Fe, Pb, Mn, Hg, Mo, Ni, Se & Zn (samples must be filtered & preserved in lab)

⇒ Bill GPM direct (Attention: Mel Driver)

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
Gil Van Deventer 2000 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
Gil Van Deventer 8-15-97 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
BDM Environmental Services (Company)	(Company)	(Company)

Received By 1.	Received By 2.	Received By (Laboratory) 3.
(Signature) (Time)	(Signature) (Time)	Suzy Abbe (Signature) 9:45 (Time)
(Printed Name) (Date)	(Printed Name) (Date)	Suzy Abbe (Printed Name) 8/16/97 (Date)
(Company)	(Company)	Trace Analysis (Laboratory)

Distribution: White, Canary-Laboratory • Pink, BDM

228AF

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

13183

Chain of Custody

Date 8-15-97 Page 1 Of 1

Lab Name Trace Analysis Inc
Address 6701 Aberdeen Ave.
Lubbock Tx 79424
Telephone 800-378-1296

Samplers (SIGNATURES) [signature]

Analysis Request

Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX	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	TPH/BTEX Modified 8015	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)	Dissolved Metals*	Ca, Na, Mg, F, K, TDS, SO_4, Cl, HCO_3, NO_3		Number of Containers
970815 0940	Water	MW-12		✓																					✓	✓	✓	5
970815 1035	Water	MW-13		✓																					✓	✓	✓	5
970815 1000	Water	MW-14d		✓	Duplicate					of	MW-11																	2
970815 1130	Water	MW-11		✓																					✓	✓	✓	5
970815 1140	Water	MW-9		✓																					✓	✓	✓	5
970815 1445	Water	MW-10		✓																					✓	✓	✓	5
970815 1530	Water	MW-10d		✓																					✓	✓	✓	5
970815 1540	Water	Rinsate		✓																								2

Project Information	Sample Receipt
Project GPM-Linam Ranch Plant	Total No. of Containers
Project Director G. Van Deventer	Chain of Custody Seals
Charge Code No. LREOTT-20-300	Rec'd Good Condition/Cold
Shipping ID. No. 155-448-996-0	Conforms to Record
Via: TNM&O Bus Greyhound	Lab No.

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
[signature] 2000 (Time)	(Signature) (Time)	(Signature) (Time)
G. Van Deventer 8-15-97 (Date)	(Printed Name) (Date)	(Printed Name) (Date)
BDM Environmental Services (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)	(Laboratory)

Special Instructions/Comments: *Dissolved metals: Al, Ag, As, Ba, B, Cd, Co, Cu, Cr, Fe, Pb, Mn, Hg, Mo, Ni, Se & Zn (samples must be filtered & preserved in lab)

⇨ Bill GPM direct (Attention: Mel Driver)

Distribution: White, Canary-Laboratory • Pink, BDM

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

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil VanDeventer
415 W. Wall, Suite 1818
Midland, TX 79701

January 27, 1997
Receiving Date: 01/23/97
Sample Type: Water
Charge Code No: P/2398/21
Project Location: Linam Ranch Plant
COC# 10290

Prep Date: 01/24/97
Analysis Date: 01/24/97
Sampling Date: 01/22/97
Sample Condition: I & C
Sample Received by: JH
Project Name: GPM

TA#	FIELD CODE		BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	M,P,O XYLENE (mg/L)	TOTAL BTEX (mg/L)
T66157	9701220845	MW-9	<0.001	<0.001	<0.001	<0.001	<0.001
T66158	9701220940	MW-12	<0.001	<0.001	<0.001	<0.001	<0.001
T66159	9701221045	MW-13	0.048	<0.001	<0.001	<0.001	0.048
T66160	9701221130	MW-11	0.267	<0.001	<0.001	0.017	0.284
T66161	9701221200	MW-11d	0.274	<0.001	<0.001	0.017	0.291
T66162	9701221215	Rinsat	<0.001	<0.001	<0.001	<0.001	<0.001
T66163	9701221330	MW-10d	0.365	<0.005	<0.005	<0.005	0.365
T66164	9701221445	MW-10	6.41	1.63	0.294	0.634	8.97
T66165	9701221500	Trip Blank	<0.001	<0.001	<0.001	<0.001	<0.001
QC	Quality Control		0.097	0.098	0.099	0.301	
Reporting Limit			0.001	0.001	0.001	0.001	
RPD			1	1	0	1	
% Extraction Accuracy			104	105	106	106	
% Instrument Accuracy			97	98	99	100	

METHODS: EPA SW 846-5030, 8020.
CHEMIST: RW
BTEX SPIKE AND QC: 0.100 mg/L BTEX.

BZ
Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

1-27-97
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
BDM INTERNATIONAL, INC.
Attention: Gil Vandeventer
415 W. Wall, Suite 1818
Midland, TX 79701

January 28, 1997
Receiving Date: 01/23/97
Sample Type: Water
Charge Code No: P/2398/21
Project Location: Linam Ranch Plant
COC #10290

Prep Date: 01/23/97
Analysis Date: 01/23/97
Sampling Date: 01/22/97
Sample Condition: Intact & Cool
Sample Received by: JH
Project: GPM

TA#	FIELD CODE	NITRATE-N (mg/L)	SULFATE (mg/L)
T66157	9701220845 MW-9	3.4	71
T66158	9701220940 MW-12	<1.0	150
T66159	9701221045 MW-13	5.4	65
T66160	9701221130 MW-11	24	170
T66163	9701221330 MW-10d	<1.0	210
T66164	9701221445 MW-10	<1.0	56
QC	Quality Control	10	25
	REPORTING LIMIT	1.0	1.0
	RPD	5	0
	% Extraction Accuracy	103	103
	% Instrument Accuracy	100	100

METHODS: EPA 300.0.
CHEMIST: MS
NITRATE-N SPIKE: 200 mg/L Nitrate-N.
NITRATE-N QC: 10 mg/L Nitrate-N.
SULFATE SPIKE: 500 mg/L Sulfate.
SULFATE QC: 25 mg/L Sulfate.

BL

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

1-28-97
DATE

TRACEANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

DISK 67 286

GCL
Environmental Science and Engineering
A BDM International Company

☐ Albuquerque
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001
FAX: (505) 842-0595

☐ Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 10290

Chain of Custody

Date 1/22/97 Page 1 Of 1

Lab Name TRACE ANALYSIS
Address 6701 ABERDEENE AVENUE
LUBBOCK TX 79424
Telephone (806) 794-1296

Samplers (SIGNATURES) D Nee

Analysis Request

	Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX	Phenols, Sub Phenols 604/8040	Pesticides/PCB 608/8080	Polynuclear Aromatic Hydrocarbons 610/831C	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	TPH/BTEX Modified 8015	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)	Sulfides				Number of Containers
6157	9701220845	H2O	MW-9		2																					1				
6158	9701220940	H2O	MW-12		2																					1				
6159	9701221045	H2O	MW-13		2																					1				
6160	9701221130	H2O	MW-11		2																					1				
6161	9701221200	H2O	MW-11d		2																									
6162	9701221215	H2O	Rinsate		2																									
6163	9701221330	H2O	MW-10d		2																					1				
6164	9701221445	H2O	MW-10		2																					1				
6165	9701221500	H2O	TRIP BLANK		2																									

Project Information

Project GPM Lime Ranch Plant
Project Director G.I. Van Deventer
Charge Code No. 3100 007
Shipping ID. No.
Via Gary Howard

Sample Receipt

Total No. of Containers	24
Chain of Custody Seals	Y
Rec'd Good Condition/Cold	Y
Conforms to Record	Y
Lab No.	

Special Instructions/Comments:

Relinquished By 1.
D Nee 1910
(Signature) (Time)
DAVID NEE 1/22/97
(Printed Name) (Date)
BDM
(Company)

Relinquished By 2.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Relinquished By 3.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Received By 1.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Received By 2.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Received By (Laboratory) 3.
R Cutberdell
(Signature) (Time)
Renee C. Hardell 1320A
(Printed Name) (Date)
Trace Analysis 1/23/97
(Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

CIT

23AE

GCL
Environmental Science and Engineering
A BDM International Company

☐ Albuquerque
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001
FAX: (505) 842-0595

☐ Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 10290

Chain of Custody

Date 1/22/97 Page 1 Of 1

Lab Name TRACE ANALYSIS
Address 6701 ABERDEENE AVENUE
LUBBOCK TX 79424
Telephone (806) 794-1296

Samplers (SIGNATURES) D. Nee

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	TPH/BTEX Modified 8015	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)	Soil Moist				Number of Containers
9701220845	H2O	MW-9		2																					1				
9701220940	H2O	MW-12		2																					1				
9701221045	H2O	MW-13		2																					1				
9701221130	H2O	MW-11		2																					1				
9701221200	H2O	MW-11d		2	duplicate of MW-11																								
9701221215	H2O	Rinsate		2																									
9701221330	H2O	MW-10d		2																					1				
9701221445	H2O	MW-10		2																					1				
9701221500	H2O	TRIP BLANK		2																									

Project Information	
Project	GPM-Linam Ranch Plant
Project Director	G.J. Van Deventer
Charge Code No.	3100-007
Shipping ID. No.	
Via	Fedex Ground

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

Special Instructions/Comments:

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
D. Nee 1410 (Signature) (Time)	(Signature) (Time)	(Signature) (Time)
DAVID NEE 1/22/97 (Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
BDM (Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)	(Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TEXAS 75202-2733

February 10, 1997

Mr. Pat Sanchez
Oil Conservation District
2040 South Pacheco
Santa Fe, NM 87505

Dear Mr. Sanchez:

Enclosed you will find a copy of the inspection report developed for those facilities visited by EPA for RCRA inspections in Hobbs, NM.

I will be sending you other reports as they become available from my contractor.

I hope these documents will assist you in preparing and monitoring the Discharge Plans completed for the oil and gas industry in Hobbs, NM. If you need anything else, I will be glad to help you. My number is (214)665-2287.

Sincerely,

Gregory E. Pashia

Gregory E. Pashia, Enforcement Officer
ALONM Section
RCRA Enforcement Branch

Enclosures: (4)

Kearney/Centaur Division
A.T. Kearney, Inc.
Lincoln Plaza, Suite 4170
500 North Akard Street
Dallas, Texas 75201
214 969 0010
Facsimile 214 720 5900

Management Consultants

RZ2-R06054.01-ID-022

AT KEARNEY

January 31, 1997

Ms. Rena McClurg
Regional Project Officer
U.S. EPA Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Reference: EPA Contract No. 68-W4-0006; EPA Work Assignment No. R06054; Oil and Gas Service Industry Inspections; Subtask 01-07; GPM Gas Corporation, Inc., Linam Ranch Natural Gas Plant; Letter Report

Dear Ms. McClurg:

Attached please find a letter report addressed to Mr. Greg Pashia, the EPA Work Assignment Manager, documenting the inspection activities conducted at GPM Gas Corporation Inc., Linam Ranch Natural Gas Plant in Hobbs, New Mexico, on November 22, 1996. As discussed with Mr. Pashia, the enclosed inspection report has been formatted as a letter report. Attachments to the letter report include a copy of the logbook kept during the inspection, photographs taken during a site tour, and documents received from the facility.

Additionally, Mr. Mark Nault, GPM, Plant Manager requested that a copy of the report for this facility, be sent to him at 11525 Carlsbad Highway, Hobbs, New Mexico, 88240.

Please feel free to contact me at (214) 777-5258 if you have any questions.

Sincerely,

Debra Pandak
Regional Manager

cc: G. Pashia, EPA Region 6 WAM
B. Rhottenberry, EPA
B. Jordan. Central Files
D. Irvin
Dallas Files

Kearney/Centaur Division
A.T. Kearney, Inc.
Lincoln Plaza, Suite 4170
500 North Akard Street
Dallas, Texas 75201
214 969 0010
Facsimile 214 720 5900

Management
Consultants

RZ2-R06054.01-ID-022

January 31, 1997

AT KEARNEY

Mr. Greg Pashia
Work Assignment Manager
U.S. EPA Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Reference: EPA Contract No. 68-W4-0006; EPA Work Assignment No. R06054; Subtask 01-07; Oil and Gas Service Industry Inspections; GPM Gas Corporation, Inc., Linam Ranch Natural Gas Plant; EPA ID NO. NMD360023503

Dear Mr. Pashia:

A.T. Kearney, Inc., was tasked to support the Environmental Protection Agency, Region 6, in conducting a Compliance Evaluation Inspection (CEI) at the GPM Gas Corporation, Inc., Linam Ranch Natural Gas Plant (GPM) facility located in Hobbs, New Mexico, under the RCRA Enforcement, Permitting and Assistance (REPA) Contract 68-W4-0006, Work Assignment R06054. This letter report, with attachments, presents the results of the November 17, 1996, visual drive-by reconnaissance inspection and the CEI conducted on November 22, 1996.

Visual Drive-by

At 0940 hours on November 17, 1996, Mr. Dan Irvin and Ms. Cathy Dare of A.T. Kearney and Mr. Wally O'Rear of Metcalf and Eddy (M&E) conducted a visual drive-by reconnaissance inspection of the GPM facility located at 11525 Carlsbad Highway, Hobbs, New Mexico, 88240. This inspection consisted of observing the facility property from public access roadways in order to identify potential waste management areas present at the site. Four photographs of the facility property (see Photographs 0-1 and 0-4) were taken from off-site.

On-Site Visit

At 0815 hours on November 22, 1996, Mrrs. Greg Pashia and William Rhottenberry of EPA Region 6, Mrrs. Irvin and O'Rear and Ms. Dare arrived at the GPM facility and

were greeted by Mr. John Eggerman, GPM Plant Engineer. Mr. Rhottenberry announced the inspection. Mr. Eggerman indicated that prior to beginning any inspection activities the inspection team would be required to watch an approximately 20 minute safety video. After viewing the safety video, Mr. Eggerman answered several questions posed by the inspection team based on questions raised during the watching of the video.

At 0900 hours, an opening meeting was conducted. Mr. Scott Sebby, GPM's corporate Environmental Manager, joined the meeting via conference call. Mr. Pashia explained the purpose of the inspection. Mr. Sebby stated that the GPM facility was originally built in 1953 and had passed through several ownerships prior to being purchased by GPM in 1995. It was noted that the facility had a 200 million gallon per day liquefied natural gas production capacity. The layout of the facility is shown in a plot plan provided by the facility (see copy attached). Mr. Sebby indicated that all of the facility's raw materials are received by the facility via three pipelines.

Mr. Pashia inquired about a surface impoundment located, known as "duck pond", on the southwest portion of the facility property. Mr. Sebby stated that the surface impoundment was used by a former owner (Enron) as a holding pond for water generated in the facility's primary separation process. He indicated that GPM does not pump water into the surface impoundment and only uses the impoundment as an emergency overflow basin. He indicated that he had no knowledge of any production wastes ever being discharged to the surface impoundment. Mr. Eggerman indicated that GPM maintains a certain level of water in the impoundment in order to ensure that the impoundment's liner does not bubble or deteriorate. Mr. Sebby indicated that no RCRA hazardous wastes are generated by the facility and that waste oils generated at the facility are reused as feed materials at a GPM facility located on the Gulf Coast. Mr. Sebby informed the inspection team that the facility has received a New Mexico Oil Conservation District (OCD) discharge permit. At 0920 hours, Mr. Sebby disconnected from the conference call line. Mr. Eggerman supplied the inspection team with a copy of the facility's waste management plan for review.

At 0955 hours, the inspection team was joined by GPM's Plant Manager, Mr. Mark Nulte, to begin a tour of the surface impoundment. The inspection team proceeded to the surface impoundment via vehicle. The impoundment consisted of an approximately one acre lined pond (see Photographs 1-2 through 1-4). Mr. Eggerman indicated the waters from primary separation process are pumped to a holding tank (see Photograph 1-1 and 1-4) located adjacent to the surface impoundment. After reaching a level of approximately one-third of the volume of the tank, the water is automatically discharged to a sewer system connected to the OCD. Water would only be discharged to the pond in an emergency tank overflow.

Facility representatives also indicated that a spill of monoetholamine (MEA) had occured approximately one month ago. MEA is used to sweeten gas. According to the facility representatives, the spill was reportedly deemed exempt by the OCD.

A ground water remediation project is also occuring in the southeast portion of the plant. The clean-up is voluntary and reportedly under the authority of the OCD.

Mr. Nault also indicated that slude from the cooling tower tanks/basins has been dried, sampled and subsequently spread across the facility grounds. According to the facility, analytical results did not exceed EPA limits. On December 9, 1996, GPM mailed additional information regarding the cooling tower sediments. Attached to this report is a copy of the letter received, which includes analytical data and a copy of the sample chain-of-custody.

The inspection team returned to the facility's administrative building to conduct a brief close-out meeting at 1020 hours. Mr. Sebby joined the close-out meeting via conference call. The inspection team concluded the close-out meeting at 1030 hours and departed the facility property at 1044 hours.

Please feel free to contact me or Dan Irvin at (703) 739-1659 if you have any other questions regarding this report.

Sincerely,

Debra Pandak
Regional Manager

cc: B. Rhottenberry, EPA
B. Jordan, Central Files
D. Irvin
C. Dare
W. O'Rear
Dallas Files

INCH CM

IF YOU KNOW	MULTIPLY BY	TO FIND
LENGTH		
inches	2.540	centimeters
feet	30.480	centimeters
yards	0.914	meters
miles	1.609	kilometers
millimeters	0.039	inches
centimeters	0.393	inches
meters	3.280	feet
meters	1.093	yards
kilometers	0.621	miles
WEIGHT		
ounces	28.350	grams
pounds	0.453	kilograms
grams	0.035	ounces
kilograms	2.204	pounds
VOLUME		
fluid ounces	29.573	milliliters
pints	0.473	liters
quarts	0.946	liters
gallons (U.S.)	3.785	liters
milliliters	0.033	fluid ounces
liters	1.056	quarts
liters	0.264	gallons (U.S.)

TEMPERATURE

°C = (°F - 32) x .555
°F = (°C x 1.8) + 32

Inches	Decimals of foot	Milli-meters
1/16	.0052	1.5875
1/8	.0104	3.1750
3/16	.0156	4.7625
1/4	.0208	6.3500
5/16	.0260	7.9350
3/8	.0313	9.5250
1/2	.0417	12.700
5/8	.0521	15.875
3/4	.0625	19.050
7/8	.0729	22.225
1"	.0833	25.400
2"	.1667	50.800
3"	.2500	76.200
4"	.3333	101.60
5"	.4167	127.00
6"	.5000	152.40
7"	.5833	177.80
8"	.6667	203.20
9"	.7500	228.60
10"	.8333	254.00
11"	.9167	279.40
1 foot	1.0000	304.80

"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

Name GPM GAS CORPORATION
ROUTE 18
Address APPROXIMATELY 7 MILES WEST
OF HOBBS, NM
Phone
Project

"Rite in the Rain" - a unique all-weather writing surface created to shed water and to enhance the written image. Makes it possible to write sharp, legible field data in any kind of weather.

a product of

J. L. DARLING CORPORATION
TACOMA, WA 98421-3696 USA

CONTENTS

REFERENCE	DATE

11-17-96

11.17.96

11/17/96
GPM GAS CORPORATION
0940 Photos 1-3 Photo of
GPM Natural Gas Plant
Looking Southeast
Photo 4 Photo of Burn off
at the GPM Plant LOOKING
SOUTHEAST

Could not access pond area

left the GPM site @0945

11.17.96

11-22-96

11/22/96

08'15 ARRIVE AT FACILITY
GPM GAS CORPORATION

08'20 GREETED BY ~~UNKNOWN~~ DI
FACILITY REP.
JOHN ~~ACKERMAN~~ EGGERMAN, DI PLANT ENG.

0827 WATCH SAFETY VIDEO OF
PLANT OPERATIONS.
~ 20 MIN IN DURATION

GAS INTO INLET RECEIVER
TO INLET ~~CONNE~~ DI CONTACTER
TI REMOVE AMINES
H_2S/CO_2 STRIPPED
COMPRESSED TO 650 PSIG
~~IN~~ DI H_2O CONDENSATE
REMOVED GENERATE LIQ. S
OTHER GASES ALSO generated
(i.e., METHANE)
AND BUTANE

11-22-96

11-22-96

0850 END VIDEO

0851 ~~A~~ DI DI

~~OPENING MEETING WITH~~ DI
~~MR. ACKERMAN~~ DI 11-22-96
11-22-96

~~NO~~ DI ONLY SOLVENTS DI
~~USED ON-SITE~~ DI 11-22-96
11-22-96

HOLD BRIEF QUESTION AND ANSWER SESSION WITH MR. ~~ACKERMAN~~ DI EGGERMAN
11-22-96

- ONLY SOLVENTS USED ON-SITE IS PARTS WASHING SOLVENT

- TANK SLUDGE ARE PUMP OUT OF TANKS VIA VACUUM TRUCKS AND DISPOSED OF AT UNKNOWN LOCATION TO MR. ~~ACKERMAN~~ DI EGGERMAN 11-22-96

11-22-96

11-22-96

11/22/96 0900

BEGIN OPENING MEETING

- SCOTT SKERBY, CORPORATION ENVIRONMENTAL MGR. 11-22-96
  ALSO ON AT OPENING MEETING VIA CONFERENCE

- FACILITY OWNED BY ENRON
  1953 FACILITY BUILT
  PURCHASED BY GPM 12 YRS AGO
- FACILITY HAS COPY OF WASTE MANAGEMENT PLAN

- PASHIA ASK ABOUT A SURFACE IMPOUNDMENT ON ~~NNE~~ SW 11-22 SIDE OF FACILITY

ENRON REPORTEDLY OPERATED THE IMPOUNDMENT.
GPM DOES NOT OPERATE IT.
NO PRODUCTION WASTES ARE PLACED IN UNIT BY GPM

11-22-96

11.22.96

11.22.96 DC PLANT MGR
MARK NULTE OF GPM
IS TO BE SPOKEN TO REGARDING
THE SURFACE IMPOUNDMENTS

ACCORDING TO SEPTBY, ONLY
NON-OIL & GAS EXEMPT WASTES
ARE WASTE OILS WHICH
ARE RECYCLED AT GAS
PLANT DI ON GULF COAST.
11.22.96

NO RCRA-REGULATED WASTES
GENERATED IN 1996.

ONE SPILL (MEA) RECENTLY (1 MTH AGO)
MONO ETHYENE AMINE
REPORTEDLY DEEMED
EXEMPT BY OCD. MEA
IS USED TO SWEETEN GAS

GW REMEDIATION PROJECT IN
SE PORTION OF PLANT.
ON-SITE CONTAMINATION
VOLUNTARY CLEAN-UP. REPORTEDLY
OCD HAS AUTHORITY

11.22.96

11-22-96

GPM HAS OCD DISCHARGE PLAN.

PARTS WASHER MAY BE IN MAINTENANCE SHOP. ANY WASTE WHICH MAY BE GENERATED. WILL BE PICKED UP BY SUPPLIER.

0920 END OPENING MEETING

0923 ECGERMAN SUPPLIES PASHIA A COPY OF THE FACILITIES WASTE MANAGEMENT PLAN FOR NEW MEXICO REGION

PASHIA REQUESTS COPY OF MSDS FOR PARTS WASHERS

GENERAL QUESTIONS REGARDING FACILITY OPERATIONS

11-22-96

11.22.96

SURFACE IMPOUNDMENT USES II IS USED AS A OVERFLOW POND FROM PRIMARY SEPARATION PROCESS.

FACILITY KEEPS H_2O IN "DOCK POND" TO PREVENT THE LINER FROM POPPING OUT OF THE GROUND.

- 200 MM GAL / DAY CAPACITY

GPM'S PARENT IS PHILLIP PETROLEUM

REPORTS SHOULD BE SENT TO
MARK NAULT, PLANT MGR
11525 CARLSBAD HWY
HOBBS, NM 88240

11.22.96

11-22-96

BEGIN SITE TOUR 0955

NAULT BELIEVES THAT DUCK POND RECEIVED PRIMARY SEPARATION WASTE. NO DISCHARGED TO POND SINCE 1987. ONLY H_2O TO KEEP LINER FROM BLISTERING

ALSO FORMERLY TO POND BOILER BLOWDOWN, COOLING

1007 SURFACE IMPOUNDMENT

APPROXIMATELY 1 ACRE LINED IMPOUNDMENT

WATERS FLOW INTO TANK WHICH IF IT OVER FLOWS IT GOES INTO SI

11-22-96

11-22-96

LIQUID IN SI
WATER IS GREENISH IN COLOR
11-22-96

SOILS/SOI DI 11-22-96 SLUDGE FROM
COOLING TOWER
TANKS/BASINS IS DI WAS
DRIED, SAMPLED AND
SPREAD ACROSS FACILITY

REPORTEDLY, NO HITS ON
ANALYTICAL

END SITE TOUR 1020

OPEN CLOSE-OUT MEETING 1030
FACILITY ID #
NMD360023503
VAULT, EGGERMAN, AND SEBBY FROM FACILITY
GET FROM FACILITY
- MSDS
- ANALYTICAL OF COOLING WATER
DATA; SEBBY WILL SEND
IRVIN A COPY OF
ANALYTICAL DATA

11-22-96

11-22-96

USED OIL IS RECYCLED

OIL: AMINE FILTER ACCUMULATED IN "SPECIAL WASTE" DUMPSTER AND MANAGED BY WASTE MGT.

END MEETING 1044
AND DEPART FACILITY

11-22-96

Wally O'Rear
1/29/97

The photolog for the GPM site photographs was originally written in a separate logbook on November 22, 1996, by Metcalf + Eddy inspection team member, Wallace O'Rear. The photographic information listed below is incorporated into this logbook to consolidate all information for report preparation.

1005 Photo #1 Tank located next to pond

1006 Photo #2, 3 + 4 Pond located SW of Plant

1008 Photo #5 Absorbent in pond

1014 Photo #6 Photo of Gas Plant Looking North near pond area.

Wallace O'Rear 1/29/97

Copy of Logbook notes for GPM Gas Corportation maintained by Wally O'Rear, Metcalf & Eddy.

11/22/96
GPM Gas Corp.
0820 Arrived at Site

Started Site tour @
1000

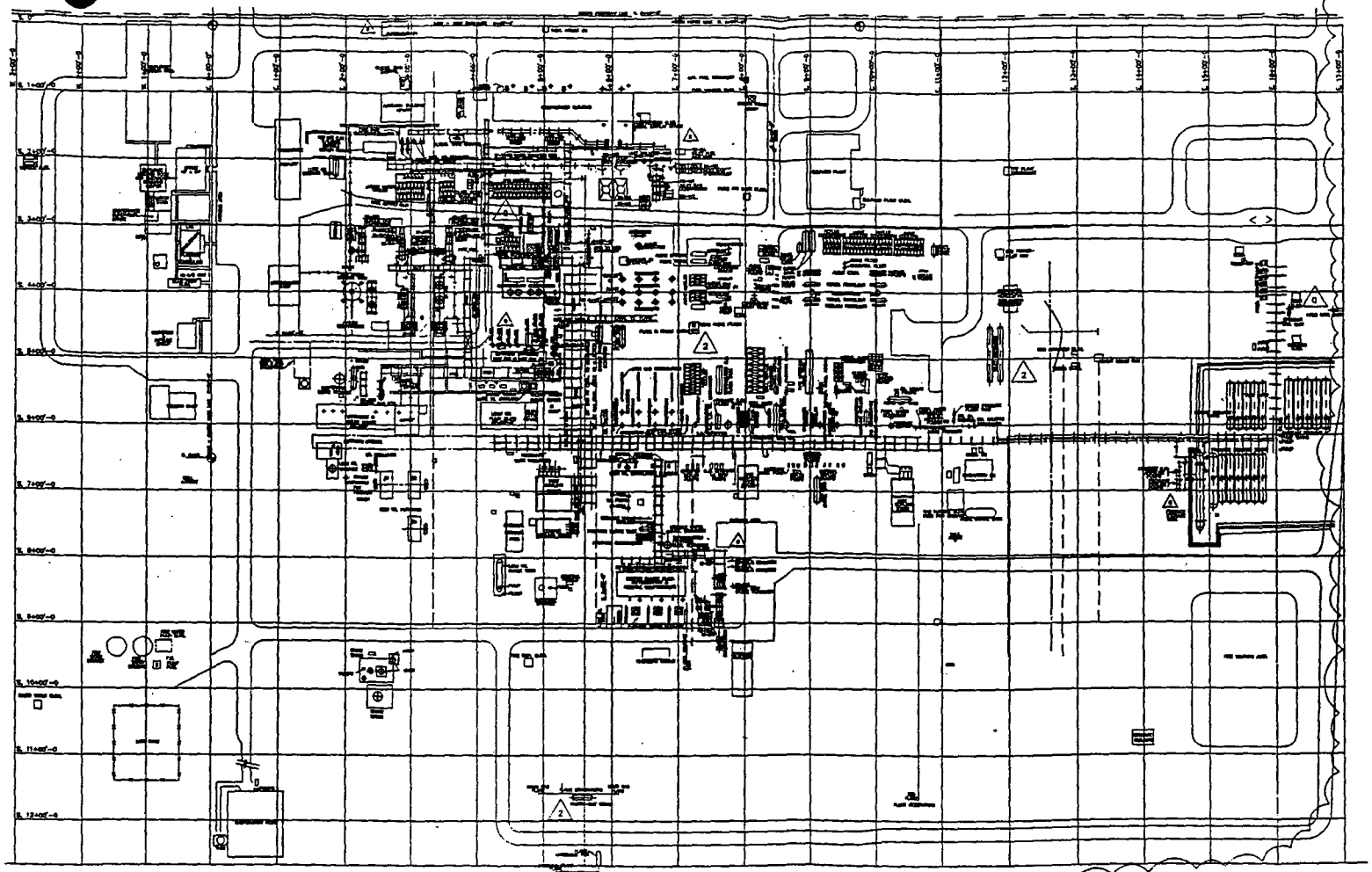
1005 Tank located
next to pond
Photo #1

1006 Pond located
SW of Plant
Photo #2, 3 + 4

1008 Absorbent in pond
Photo #5

1014 Photo #6 of Gas
Plant looking North

near pond area



NO.	REVISION	BY CHKD	DATE APP'D
0	ISSUE FOR CONSTRUCTION (I.F.C.)	L.A.MONROE / R.GULVER	1/11/93 DC/JPW
1	REVISED NOTES 16,18 & 27	L.A.MONROE / R.JAMES	6/22/93
2	ADDED INLET REC.'S, FEEDN COMP., PROPANE COOLER, FEDEN SCR., AMINE COOLER & FILTER	JAM	7/20/94
3	REMOVED GENERAL NOTES AND LEGEND	JAM	11/7/95

KTI FISH INC.

FOR ISSUE
FOR APPR
FOR CONST
DRAWN E.A.MONROE 9/6/94
CHECKED R.E.JAMES 11/2/94
APP'D D.GULVER 11/2/94

GPM Gas Corporation
Formerly PHILLIPS NATURAL GAS COMPANY

PLOT PLAN

URAM RANCH PLANT

JA NO. 16-1987
APE NO. 95406
DWG NO. GED-1043
SH NO. MP-002-3
FILE CODE
SCALE 1"=80'

PROJECT 2343.008

December 9, 1996

GPM GAS CORPORATION

GPM GAS SERVICES COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY

4044 PENBROOK
ODESSA, TX 79762

Linam Ranch Natural Gas Processing Plant
Cooling Tower Sediment TCLP Analysis

Mr. Daniel J. Irvin, Manager
Kearney/Centaur Division
A.T. Kearney, Inc.
225 Reinekers Lane
Alexandria, Virginia 22314

Dear Mr. Irvin:

As requested during your and your colleague's visit of Linam Ranch Natural Gas Processing Plant (Linam Ranch Plant) November 22, 1996, please find enclosed Cardinal Laboratories Chain of Custody Record and Inorganic Toxicity Characteristic Leaching Procedure (TCLP) Analysis Report for cooling tower sediment disposed at Linam Ranch Plant. The Inorganic TCLP Analysis was performed based on cooling tower water contact with inorganics and process knowledge. As indicated by Cardinal Laboratories' Inorganics TCLP Analysis Report, none of the inorganics exceeded regulatory levels.

To ensure an accurate understanding of disposal of the cooling tower water and sediment at Linam Ranch Plant in May of 1995, following is a summary of the procedures utilized to cleanout the cooling towers and dispose of the water and sediment.

1. An above ground temporary containment was constructed at Linam Ranch Plant and lined with plastic sheathing.

2. Cooling tower water and sediment was vacuumed from the cooling tower basin and transferred into the temporary containment.

3. Cooling tower sediment was allowed to settle and separate from the cooling tower water.

4. Cooling tower water was pumped from the temporary containment and disposed of into Rice Engineering, Inc.'s wastewater disposal well.

5. Cooling tower sediment sample was delivered to Cardinal Laboratories for Inorganic TCLP Analysis.

6. Cooling tower sediment was disposed on the ground at Linam Ranch Plant after Inorganic TCLP Analysis results indicated no exceedance of inorganic regulatory levels.

The EPA's, A.T. Kearney's, and Metcalf & Eddy's time and energy to review GPM's waste management practices is greatly appreciated. GPM welcomes and would appreciate any recommendations the EPA, A.T. Kearney, or Metcalf & Eddy may have for disposal of wastes at Linam Ranch Plant.

Please do not hesitate to contact me at (915) 368-1142 should you have any questions or require additional information. Thank you.

Sincerely,

Scott Seeby

Scott Seeby
Environmental Engineer
New Mexico Region

CARDINAL LABORATORIES

PHONE (915) 673-7001 • 2111 BEECHWOOD • ABILENE, TX 79603
PHONE (505) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240
PHONE (505) 326-4669 • 118 S. COMMERCIAL AVE. • FARMINGTON, NM 87401

TCLP ANALYSIS REPORT

Company: GPM
Address: 11525 W. Carlsbad Hwy.
City, State: Hobbs, NM

Date: 5/15/95
Lab #: H2031

Project Name: not given
Location: Linam Ranch
Sampled by: MO
Sample Type: Sludge

Date: not given
Sample Condition: Intact

Sample ID: Cooling Tower Sludge

TCLP INORGANICS (Leachate)

PARAMETER	RESULT	EPA LIMIT	UNITS
Silver	<0.1	5	ppm
Arsenic	<0.1	5	ppm
Barium	0.38	100	ppm
Cadmium	<0.1	1	ppm
Chromium	<0.1	5	ppm
Mercury	<0.0002	0.2	ppm
Lead	<0.1	5	ppm
Selenium	<0.1	1	ppm

METHODS: TCLP INORGANICS (Leachate) - EPA 1311/7000

Hope S. Moreno
Hope S. Moreno

5-15-95
Date

Environmental Analytical Services

CARDINAL LABORATORIES

118 S. Commercial Ave.
Farmington, NM 87401
505-326-4669
FAX 505-326-4535

101 E. Marland
Hobbs, NM 88240
505-393-2326
FAX 505-393-2476

H2031

Chain of Custody Record

Project I.D. 397-5281 FAX
Project Location ATTN: Mike Cowch
Sampled By
Client Name G.P.M. Linam Ranch
Address 11525 W. Carlsbad Hwy
Telephone 395-5216

Sample Number	Date	Time	Composite	Grab	Sample Location	Number of Containers	TCLP-Metals							Remarks (Type sample, preservation, etc.)
					Cooling Tower Sludge	1	X							

Released by: (Signature)	Date	Time	Received by: (Signature)
Mark Owens	5-2-95	3:45	[illegible]
Released by: (Signature)	Date	Time	Received by: (Signature)

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW

Appearance:

Pale liquid

Odor:

Ammonia-like odor

WARNING STATEMENT

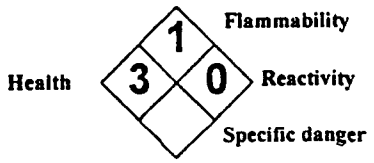
DANGER !

CORROSIVE - CAUSES EYE AND SKIN BURNS
HARMFUL OR FATAL IF SWALLOWED
MAY CAUSE DIZZINESS AND DROWSINESS
CAUSES RESPIRATORY TRACT IRRITATION AND CAN CAUSE DAMAGE
ASPIRATION HAZARD IF SWALLOWED -
CAN ENTER LUNGS AND CAUSE DAMAGE
MAY CAUSE LIVER AND KIDNEY DAMAGE BASED ON ANIMAL DATA

Hazardous Material Information System (United States)

Health	3
Fire	1
Reactivity	0
Personnal protection	

National Fire Protection Association NFPA (United States)



POTENTIAL HEALTH EFFECTS

Primary Route of Exposure

Eye X Skin X Inhalation X Ingestion

Effects of Overexposure

Acute:

Eyes: Causes irritation, experienced as pain, with excess blinking and tear production, and seen as extreme redness and swelling of the eye and chemical burns of the eye. Severe eye damage may cause blindness.

Skin: Causes severe irritation with pain, severe excess redness and swelling with chemical burns, blister formation, and possible tissue destruction. Other than the potential skin irritation effects noted above, acute (short term) adverse effects are not expected from brief skin contact; see other effects, below, and Section 11 for information regarding potential long term effects.

Inhalation: Vapors or mist, especially as generated from heating the material or as from exposure in poorly ventilated areas or confined spaces, are irritating and cause nasal discharge, coughing, and discomfort in nose and throat. Prolonged or repeated overexposure may result in lung damage. Inhalation may cause dizziness, drowsiness, euphoria, loss of coordination, disorientation, headache, nausea, and vomiting. In poorly ventilated areas or confined spaces, unconsciousness and asphyxiation may result. Prolonged or repeated overexposure may result in the absorption of potentially harmful amounts of material.

Ingestion: Causes burning of mouth, throat, and stomach with abdominal and chest pain, nausea, vomiting, diarrhea, thirst, weakness, and collapse. Aspiration may occur during swallowing or vomiting, resulting in lung damage.

Sensitization Properties: Unknown

Chronic:

Repeated skin contact may cause a persistent irritation or dermatitis. Repeated inhalation may cause lung damage.

Medical Conditions Aggravated by Exposure:

Skin contact may aggravate an existing dermatitis (skin condition). Overexposure to vapor, dust or mist may aggravate existing respiratory conditions, such as asthma, bronchitis, and inflammatory or fibrotic respiratory disease. Repeated overexposure may aggravate existing liver or kidney disease.

Other Remarks:

This product contains one or more amines which may produce temporary and reversible hazy or blurred vision. Symptoms disappear when exposure is terminated.

4. FIRST AID MEASURES

Eyes:

Immediately flush eyes with large amounts of running water for at least 15 minutes. Hold eyelids apart while flushing to rinse entire surface of eye and lids with water. Do not attempt to neutralize with chemical agents. Obtain medical attention immediately. Continue flushing for an additional 15 minutes if medical attention is not immediately available.

Skin:

Immediately remove contaminated clothing and shoes. Under a safety shower, flush skin thoroughly with large amounts of running water for at least 15 minutes. Do not attempt to neutralize with chemical agents. Get medical attention immediately. Discard or decontaminate clothing and shoes before reuse.

Ingestion:

If person is conscious and can swallow, immediately give two glasses of water (16 oz.) but do not induce vomiting. This material is corrosive. If vomiting occurs, give fluids again. Have a physician determine if condition of patient will permit induction of vomiting or evacuation of stomach. Do not give anything by mouth to an unconscious or convulsing person.

Inhalation:

If inhaled, remove to fresh air. If not breathing or in respiratory distress, clear person's airway and start artificial respiration. With a physician's advice, give supplemental oxygen using a bag-valve mask or manually triggered oxygen supply.

Other Instructions:

Swallowing of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this product during induced emesis can result in severe lung injury. If evacuation of stomach is necessary, use method least likely to cause aspiration, such as gastric lavage after endotracheal intubation. Contact a Poison Control Center for additional treatment information.

Remove and dry-clean or launder clothing soaked or soiled with this material before reuse. Dry cleaning of contaminated clothing may be more effective than normal laundering. Inform individuals responsible for cleaning of potential hazards associated with handling contaminated clothing.

5. FIRE-FIGHTING MEASURES

Ignition Temperature - AIT (degrees C):

Not determined.

Flash Point (degrees C):

Not determined.

Flammable Limits % (Lower-Upper):

Lower: 5
Upper: 17

Recommended Fire Extinguishing Agents And Special Procedures:

Use water spray, dry chemical, foam, or carbon dioxide to extinguish flames. Use water spray to cool fire-exposed containers. Water or foam may cause frothing.

Unusual or Explosive Hazards:

None

Special Protective Equipment for Firefighters:

Wear special chemical protective clothing and positive pressure self-contained breathing apparatus. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Decontaminate or discard any clothing that may contain chemical residues.

6. ACCIDENTAL RELEASE MEASURES (Transportation Spills: CHEMTREC (800)424-9300)

Procedures in Case of Accidental Release, Breakage or Leakage:

Ventilate area. Avoid breathing vapor. Wear appropriate personal protective equipment, including appropriate respiratory protection. Contain spill if possible. Wipe up or absorb on suitable material and shovel up. Prevent entry into sewers and waterways. Avoid contact with skin, eyes or clothing.

7. HANDLING AND STORAGE

Precautions to be Taken in

Handling:

Minimum feasible handling temperatures should be maintained. Eye wash and safety shower should be available nearby when this product is handled or used.

Storage:

Periods of exposure to high temperatures should be minimized. Water contamination should be avoided.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective Equipment (Type)

Eye/Face Protection:

Avoid eye contact. Chemical type goggles with face shield must be worn. Do not wear contact lenses.

Skin Protection:

Protective clothing such as coveralls or lab coats must be worn. Launder or dry-clean when soiled. Gloves resistant to chemicals and petroleum distillates required. When handling large quantities, impervious suits, gloves, and rubber boots must be worn.

Respiratory Protection:

Airborne concentrations should be kept to lowest levels possible. If vapor, mist or dust is generated and the occupational exposure limit of the product, or any component of the product, is exceeded, use appropriate NIOSH or MSHA approved air purifying or air supplied respirator after determining the airborne concentration of the contaminant. Air supplied respirators should always be worn when airborne concentration of the contaminant or oxygen content is unknown.

Ventilation:

Adequate to meet component occupational exposure limits (see Section 2).

Exposure Limit for the Total Product:

None established for product; refer to Section 2 for component exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:

Pale liquid

Odor:

Ammonia-like odor

Boiling Point (degrees C):

Not determined.

Melting/Freezing Point (degrees C):

Not determined.

Specific Gravity (water=1):

1.03

pH:

12

Vapor Pressure:

Not determined.

Viscosity:

< 20 cSt at 37.7 C (100 F)

VOC Content:

Not Determined

Vapor Density (Air=1):

Not determined.

Solubility in Water (%):

>10

Other:

None

10. STABILITY AND REACTIVITY

This Material Reacts Violently With:

Air Water Heat Strong Oxidizers Others X None of these

Comments:

This material reacts violently with acids.

Products Evolved When Subjected to Heat or Combustion:

Toxic levels of ammonia, combustion products of nitrogen, carbon monoxide, carbon dioxide, irritating aldehydes and ketones may be formed on burning in a limited air supply.

Hazardous Polymerizations:

DO NOT OCCUR

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Oral:
LD50 Believed to be > .50 - 2.00 g/kg (rat) moderately toxic
Inhalation:
Not determined.
Dermal:
LD50 Similar product 1.00 g/kg (rabbit) slightly toxic

IRRITATION INDEX, ESTIMATION OF IRRITATION (SPECIES)

Skin:
(Draize) Believed to be > 6.50 - 8.00 /8.0 (rabbit) corrosive
Eyes:
(Draize) Believed to be > 80.00 - 110.00 /110 (rabbit) extremely irritating
Sensitization:
Not determined.

Other:

Prolonged and repeated ingestion of monoethanolamine has caused kidney and liver damage in laboratory animals. In addition, a developmental toxicity study, using unconventional statistical treatment of the data, demonstrated developmental toxicity in rats. The true signifigance of the study data is not clear, since a full re-interpretation of this data is not possible at this time. Additional or repeat studies are planned or underway to better define the toxic potential of this product, or to verify the results obtained from previous animal studies.

12. DISPOSAL CONSIDERATIONS:

Waste Disposal Methods:

This product has been evaluated for RCRA characteristics and does not meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA, it is the responsibility of the user of the product to deter- mine at the time of disposal, whether the product meets RCRA criteria for hazardous waste. This is because product uses, transformations, mixtures, processes, etc. may render the resulting materials hazardous.

Remarks:

None

13. TRANSPORT INFORMATION

Transportation

DOT:

Proper Shipping Name:
Ethanolamine solution

Hazard Class:
8

Identification Number:
UN 2491

Packing Group:
III

Label Required:
Corrosive

IMDG

Proper Shipping Name:

Not evaluated

ICAO

Proper Shipping Name:
Not evaluated

TDG

Proper Shipping Name:
Not evaluated

Hazard Class:
Not evaluated

Identification Number:
Not evaluated

Label Required:
Not evaluated.

14. REGULATORY INFORMATION

Federal Regulations:

SARA Title III:

Section 302/304 Extremely Hazardous Substances

Chemical Name	CAS Number	Range in %	TPQ	RQ
None.				

Section 311 Hazardous Categorization:

Acute X Chronic X Fire Pressure Reactive N/A

Section 313 Toxic Chemical

Chemical Name	CAS Number	Concentration
None.		

CERCLA 102(a)/DOT Hazardous Substances:

Chemical Name	CAS Number	Range in %	RQ
None.			

States Right-to-Know Regulations:

Chemical Name	State Right-to-know
Ethanol, 2-amino-	CT, FL, IL, MA, NJ, PA, RI

State list: CT (Connecticut), FL (Florida), IL (Illinois), MI (Michigan), LA (Louisiana), MA (Massachusetts), NJ (New Jersey), PA (Pennsylvania), RI (Rhode Island)

California Prop. 65:

The following detectable components of this product are substances, or belong to classes of substances, known to the State of California to cause cancer and/or reproductive toxicity.

Chemical Name	CAS Number
None.	

INTERNATIONAL REGULATIONS:

TSCA Inventory Status:

This product, or its components, are listed on or are exempt from the the Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

WHMIS Classification:

Class E: Corrosive

Canadian Inventory Status:

This product, or its components, are listed on or are exempt from the Canadian Domestic Substance List (DSL).

EINECS Inventory Status:

This product, or its components, are listed on or are exempt from the European Inventory of Existing Chemical Substances (EINECS) or the European List of Notified Chemical Substances (ELINCS).

Australian Inventory Status:

This product, or its components, are listed on or are exempt from the Australian Inventory of Chemical Substances (AICS).

Japan Inventory Status:

This product, or its components, are listed on or are exempt from the Japan Ministry of International Trade and Industry (MITI) inventory.

15. ENVIRONMENTAL INFORMATION

Aquatic Toxicity:

LC50-96hr Aquatic toxicity rating is > 100.00 - 1000.00 ppm practically non-toxic

Mobility:

Not determined.

Persistence and Biodegradability:

Not determined.

Potential to Bioaccumulate:

Not determined.

Remarks:

None

16. OTHER INFORMATION 5/1/96

None

THE INFORMATION CONTAINED HEREIN IS BELIEVED TO BE ACCURATE. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT FOR PURPOSE OF HAZARD COMMUNICATION AS PART OF HUNTSMAN'S PRODUCT SAFETY PROGRAM. IT IS NOT INTENDED TO CONSTITUTE PERFORMANCE INFORMATION CONCERNING THE PRODUCT. NO EXPRESS WARRANTY, OR IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE IS MADE WITH RESPECT TO THE PRODUCT OR THE INFORMATION CONTAINED HEREIN. DATA SHEETS ARE AVAILABLE FOR ALL HUNTSMAN PRODUCTS. YOU ARE URGED TO OBTAIN DATA SHEEETS FOR ALL HUNTSMAN PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE AND YOU ARE ENCOURAGED AND REQUESTED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE APPLICABILITY OR EFFECTS OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, USER SHOULD CONSULT HIS LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. HUNTSMAN DOES NOT UNDERTAKE TO FURNISH ADVICE ON SUCH MATTERS.

PRODUCT CODE AND NAME	: *MEALFG*	*MONOETHANOLAMINE LFG-85%*
DATE ISSUED	: 5/3/96	
SUPERCEDES	:	
COMPANY	: HUNTSMAN	

Date: 5/1/96. Verified by Phillip B. Valkovich.

Inquiries regarding MSDS should be directed to:

Huntsman
Coordinator, Product Safety
P.O. Box 27707
Houston, TX 77227-7707


LINAM RANCH
NATURAL GAS
PLANT
11 11'96

Photo #0-1 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 0940

View, looking northeast, of GPM facility.

Photo By: Wallace O'Rear **Date:** November 17, 1996


LINAM RANCH
NATURAL GAS
PLANT
11 17 96

Photo #0-2 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 0940

View, looking north north east, of GPM facility

.

Photo By: Wallace O'Rear **Date:** November 17, 1996


LINAM RANCH
NATURAL GAS
PLANT
GPM
11 17 96

Photo #0-3 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 0940

View, looking north northeast, of the GPM facility.

Photo By: Wallace O'Rear **Date:** November 17, 1996


11 17 '96

Photo #0-4 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 0940

View, looking northeast, of primary separation hydrocarbon gas flare.

Photo By: Wallace O'Rear **Date:** November 17, 1996


11 22 '06

Photo #1-1 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 1005

View, looking southeast, of the primary separation water holding tank.

Photo By: Wallace O'Rear **Date:** November 22, 1996


11 22 '98

Photo #1-2 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 1006

View, looking east, of the southern portion of the surface impoundment.

Photo By: Wallace O'Rear **Date:** November 22, 1996


11 22 '96

Photo #1-3 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 1006

View, looking northeast, of the primary separation water surface impoundment.

Photo By: Wallace O'Rear **Date:** November 22, 1996


11 22 '96

Photo #1-4 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 1006

View, looking north northeast, of the separation water holding tank. The surface impoundment is also pictured on the right side of the photograph.

Photo By: Wallace O'Rear **Date:** November 22, 1996


11 28 '96

Photo #1-5 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 1006

View, looking down and northeast, of absorbant booms and liquids in the surface impoundment.

Photo By: Wallace O'Rear **Date:** November 22, 1996


11'22'96

Photo #1-6 **City:** Hobbs, New Mexico
Site: GPM Gas Corporation, Inc. **Time:** 1014

View, looking north, of the GPM production facility.

Photo By: Wallace O'Rear **Date:** November 22, 1996

GPM GAS CORPORATION
4044 PENBROOK
ODESSA, TX 79762

RECEIVED
OCT 1 1996
Environmental Bureau
Oil Conservation Division

September 21, 1996

Mr. William Olson - Hydrogeologist
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 South Pacheco
State Land Office Building
Santa Fe, New Mexico 87505

RE: SECOND QUARTER 1996 SAMPLING EVENT - ANNUAL REPORT
LINAM RANCH PLANT - EOTT TANKS
LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

GPM Gas Corporation (GPM) has completed the second quarter 1996 groundwater sampling and monitoring operations at the above-referenced site in accordance with the requirements specified in your letter dated October 19, 1995. This annual report documents the previous four quarterly sampling events conducted at the site. Sampling and monitoring activities were performed by Geoscience Consultants, Ltd. (GCL).

Procedures

Prior to sampling, the monitoring wells near the EOTT tanks (MW-9 through MW-13) were gauged for depth to groundwater on April 24, 1996 using an electronic water level indicator. Immediately prior to collecting groundwater samples, each monitoring well was purged of approximately 20 to 40 gallons of development water using a decontaminated 2-inch diameter submersible pump (Grundfos Redi-Flo2). A total of approximately 145 gallons of water was purged from monitoring wells MW-9 through MW-13. Groundwater samples were obtained using a new, decontaminated, disposable bailer for each well after purging. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen were monitored during purging. Groundwater samples were collected after these parameters stabilized.

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 total benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020. The next set of water samples were transferred into appropriately preserved containers for analysis of major cations/anions and total dissolved solids (TDS). A third set of samples were transferred into acid preserved plastic containers with a decontaminated, pressurized, disposable bailer after being filtered through a filter cartridge (45 μm element) for metals analysis. Additional groundwater samples were collected from monitoring wells MW-10, MW-11, and MW-13 and sent to the laboratory for analysis of nitrate (NO_3), sulfate (SO_4), total aerobic heterotrophic plate count (HPC), and total hydrocarbon utilizing bacteria (HUB), to assess the efficacy of intrinsic bioremedial activity currently taking place. 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.

Groundwater Gradient

Based on the gauging measurements conducted on April 24, 1996, the water table elevation has not fluctuated significantly since previous measurements obtained in January 1996. Over the course of the last year, groundwater elevations have fluctuated by approximately 0.63 to 1.16 feet. Depth to groundwater in the site area occurs at approximately 48 feet below ground surface. The direction of groundwater flow is to the southeast with a hydraulic gradient of approximately 0.003 ft/ft, which is consistent with determinations made from previous gauging events.
Groundwater elevations for the current and previous monitoring events are summarized in Table 1 (Attachment A). A map that depicts the elevation of the potentiometric surface (groundwater table) and direction of groundwater flow is illustrated in Figure 1 (Attachment B). No pipeline waste liquids (phase-separated hydrocarbons) were observed in monitoring wells MW-9 through MW-13 during sampling activities.

Assuming a hydraulic conductivity of 26 to 50 feet/day (McAda, 1984) and an estimated effective porosity of 0.25, the average linear velocity of groundwater flow on site varies from approximately 75 to 150 feet/year.

Analytical Results

Groundwater sample analytical results for the current and previous sampling events are presented in Tables 2 through 6. The New Mexico Water Quality Control Commission (WQCC) standards are presented in Tables 2 through 5 for comparison. Constituents with concentrations above the WQCC standards are highlighted in boldface type. The laboratory reports and COC documentation are included in Attachment C. The most recent total dissolved BTEX concentrations are depicted graphically on Figure 2.

BTEX concentrations in monitoring wells MW-9, MW-12, and MW-13 have remained consistent compared to the previous groundwater sampling events. Dissolved BTEX concentrations in these monitoring wells have remained close to or below the laboratory detection limit of 0.001 mg/l (Table 2) and below WQCC standards.

Benzene concentrations of 7.360 mg/l, 8.140 mg/l, and 0.520 mg/l in MW-10, MW-10D, and MW-11 respectively, continue to exceed the WQCC standards of 0.010 mg/l. Ethylbenzene concentrations of 1.260 mg/l and 1.170 mg/l were observed in MW-10 and MW-10D, respectively, which exceeds the WQCC standard of 0.75 mg/l. It has been concluded that the source of elevated BTEX levels in MW-10, MW-10D, and MW-11 is from former line leaks from the inactive waste liquids pipeline in the flare area. During EOTT operation of the plant, the pipeline directed waste liquids to the EOTT tanks. The source does not appear to be directly from the EOTT tanks as originally speculated. The increase in BTEX concentrations in MW-10, MW-10D, and MW-11 over the past year, and the fact that no significant hydrocarbon concentrations in the soil or groundwater were found immediately adjacent to the EOTT tanks, support this conclusion.

During the initial sampling event in May 1995, the metal samples were not filtered, therefore the metal analyses indicate total metal concentrations (dissolved and undissolved) and many constituents exceeded WQCC standards. Because the samples were not filtered, the major fraction of the metal ions are more representative of the soil chemistry versus the dissolved groundwater chemistry. In contrast, the results for metals analyses (Table 4) and major cations and anions (Table 5) during the annual sampling event in April 1996 indicate no constituents exceeded the WQCC standards with the exception of manganese in MW-10.

The elevated level of manganese (0.93 mg/l) in MW-10 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 resulting in higher concentrations.

As with MW-10, hydrocarbon-impacted wells MW-10D and MW-11 have slightly increased levels of manganese compared to non-impacted wells MW-9, MW-12, and MW-13 which have no detectable concentrations of manganese. Similarly, MW-10, MW-10D, and MW-11 have slightly increased levels of iron compared to non-impacted wells MW-9, MW-12, and MW-13 which have no detectable concentrations of iron.

Based on the results of the metal analyses during the annual sampling event the groundwater in the site area is not adversely affected or impacted with dissolved metals.

Intrinsic Bioremediation Assessment

The evaluation of intrinsic bioremediation as a hydrocarbon removal mechanism requires evaluation of electron acceptor availability and use patterns, the enumeration of microorganisms with the capability to degrade the contaminant of concern, and the groundwater conditions that allow for electron acceptor and nutrient transport.

Electron acceptors that can be used by in situ microorganisms to achieve significant hydrocarbon degradation include oxygen, nitrogen, and sulfate, in relative order of preference. Often, more than one degradation process is operative during intrinsic bioremediation and the key lies in determining whether or not sufficient electron acceptors are available to arrest contaminant migration and/or attain remediation. The results for dissolved oxygen (DO), nitrate (NO_3), sulfate (SO_4), total aerobic heterotrophic plate count (HPC), total hydrocarbon utilizing bacteria (HUB) are summarized in Table 6.

Hydrocarbon-impacted wells (MW-10 and MW-11) are compared against non-impacted wells (MW-9, MW-12, and MW-13) to observe whether or not significant differences are observed in electron acceptor concentrations that may be related to subsurface biodegradation. An overall decrease in nitrate and sulfate concentrations since May 1995 is evident in all of the monitoring wells which may indicate the use of these receptors by micro-organisms in the course of hydrocarbon degradation. Generally, dissolved oxygen levels have been lower within the hydrocarbon-impacted plume area compared to the downgradient wells indicating active aerobic biodegradation conditions; however DO levels have fluctuated significantly over the last year and further monitoring is necessary to make more conclusive interpretations of aerobic biodegradation conditions.

Enumeration of bacterial populations (colony forming units) was also performed on a hydrocarbon-impacted well (MW-10), upgradient well (MW-11), and downgradient wells (MW-12 and MW-13) to assess if hydrocarbon-degrading bacteria were stimulated to grow in the presence of hydrocarbons. The confirmed presence of total aerobic bacteria and hydrocarbon utilizing bacteria with populations numbering between 10^4 and 10^6, indicates active aerobic biodegradation conditions; however the populations have fluctuated significantly over the last year and further monitoring is necessary to make more conclusive interpretations of aerobic biodegradation rates and conditions.
The relative concentrations of electron acceptors in wells impacted by hydrocarbons and the small size of the plume when evaluated with predicted groundwater velocity and the age of the plume suggest that natural processes, such as bacteria, have been and are actively degrading hydrocarbons. The rate of aerobic biodegradation is likely limited by the availability of the electron acceptors (primarily oxygen) within the zone of hydrocarbon impact. As indicated by current water quality in downgradient wells MW-9, MW-12 and MW-13, the electron acceptor concentrations may be sufficient to permit natural biodegradation to contain contaminant migration in a downgradient direction and thereby stabilize the spreading of hydrocarbons in groundwater.

Although BTEX levels have increased in MW-10, MW-10D, and MW-11 over the past year, with an estimated groundwater flow velocity of 75 to 150 feet/year, there has been no increase of BTEX concentrations over detection limits in the downgradient monitoring wells (MW-9, MW-12, and MW-13). These observations are strong evidence that support the fact that natural attenuation processes have kept the plume from migrating.

While intrinsic bioremediation is occurring, additional monitoring and sampling data will be required to evaluate its effectiveness in limiting the migration or elimination of the dissolved hydrocarbon plume. Continued monitoring is necessary to demonstrate that the plume is maintaining a steady state or receding condition.

Conclusions

- Benzene concentrations in MW-10, MW-10D, and MW-11 continue to exceed the WQCC standard of 0.010 mg/l. Ethylbenzene in MW-10 and MW-10D also exceed the WQCC standard of 0.75 mg/l.

- Based on the results of the metal analyses during the annual sampling event, the groundwater in the site area is not adversely affected or impacted with dissolved metals.

- No pipeline waste liquids (phase-separated hydrocarbons) were observed in monitoring wells MW-9 through MW-13 during sampling activities.

- The source of elevated BTEX levels in the groundwater near the EOTT tanks is from former line leaks from the inactive waste liquids pipeline in the flare area.

- The hydrocarbon-impacted groundwater from the line leak sources has not migrated beyond the on-site downgradient wells, and remains well within the boundaries of the facility.

Recommendations and Remedial Response

GPM requests permission from the OCD to conduct sampling and monitoring operations on a semi-annual basis for the next year and annual sampling thereafter. GPM will provide the OCD with an annual report in August 1997 that documents site conditions over the period from May 1996 to May 1997. Since the groundwater in the site area is not impacted with dissolved metals, GPM will suspend sampling operations for metal constituents. We will continue sampling the on-site monitoring wells for BTEX and biological parameters until natural attenuation processes reduce BTEX concentrations to WQCC standards. If you have any questions regarding this project please call me at 915-368-1142.

Sincerely,

Scott Seeby
Environmental Engineer
New Mexico Region

Attachments
cc: M. S. Nault, GPM-Linam Ranch Plant, NM
Jerry Sexton, OCD-Hobbs, NM
Gilbert J. Van Deventer, GCL-Midland,TX (w/o attachments)

ATTACHMENTS

ATTACHMENT A

TABLES

Table 1
Summary of Groundwater Elevations
Linam Ranch Plant - EOTT Tanks

Well	Date	Relative Ground Surface Elevations (feet)	Relative Top of Casing Elevation (feet)*	Depth to Groundwater Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)	Phase-Separated Hydrocarbon Thickness (feet)
MW-9	05-17-95	3720.48	3722.48	50.60	3671.88	0.00
	11-14-95	3720.48	3722.48	50.02	3672.46	0.00
	01-17-96	3720.48	3722.48	49.84	3672.64	0.00
	04-24-96	3720.48	3722.48	50.08	3672.40	0.00
MW-10	05-17-95	3720.76	3722.90	50.45	3672.45	0.00
	11-14-95	3720.76	3722.90	49.85	3673.05	0.00
	01-17-96	3720.76	3722.90	49.82	3673.08	0.00
	04-24-96	3720.76	3722.90	50.15	3672.75	0.00
MW-10D	05-17-95	3720.85	3723.54	51.38	3672.16	0.00
	11-14-95	3720.85	3723.54	50.63	3672.91	0.00
	01-17-96	3720.85	3723.54	50.73	3672.81	0.00
	04-24-96	3720.85	3723.54	51.18	3672.36	0.00
MW-11	05-17-95	3722.02	3724.53	51.50	3673.03	0.00
	11-14-95	3722.02	3724.53	50.34	3674.19	0.00
	01-17-96	3722.02	3724.53	50.65	3673.88	0.00
	04-24-96	3722.02	3724.53	51.22	3673.31	0.00
MW-12	05-17-95	3720.60	3722.84	50.47	3672.37	0.00
	11-14-95	3720.60	3722.84	49.52	3673.32	0.00
	01-17-96	3720.60	3722.84	49.59	3673.25	0.00
	04-24-96	3720.60	3722.84	50.09	3672.75	0.00
MW-13	05-17-95	3721.63	3723.99	51.97	3672.02	0.00
	11-14-95	3721.63	3723.99	51.42	3672.57	0.00
	01-17-96	3721.63	3723.99	51.33	3672.66	0.00
	04-24-96	3721.63	3723.99	51.65	3672.34	0.00

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

Groundwater gradient direction is towards the southeast with a hydraulic gradient of approximately 0.003 feet/feet.

Table 2
Summary of Dissolved BTEX Analytical Results
Linam Ranch Plant - EOTT Tanks

Constituent	Date	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	WQCC Standards (mg/l)
Benzene	05-17-95	<0.001	**3.225**	**0.096**	<0.001	<0.001	<0.001	0.010
	11-14-95	<0.001	**5.230**	**0.125**	**0.306**	<0.001	0.003	
	01-17-96	0.001	**6.110**	**0.841**	**0.549**	<0.001	<0.001	
	04-24-96	<0.001	**6.940**	**8.140**	**0.520**	<0.001	<0.001	
Toluene	05-17-95	<0.001	0.052	0.004	<0.001	<0.001	<0.001	0.75
	11-14-95	<0.001	0.001	0.001	<0.001	<0.001	<0.001	
	01-17-96	<0.001	**0.863**	0.001	0.004	<0.001	<0.001	
	04-24-96	<0.001	<0.010	0.046	<0.002	<0.001	<0.001	
Ethylbenzene	05-17-95	<0.001	0.049	<0.001	<0.001	<0.001	<0.001	0.75
	11-14-95	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	01-17-96	<0.001	**1.140**	<0.001	0.002	<0.001	<0.001	
	04-24-96	<0.001	**1.190**	**1.170**	<0.002	<0.001	<0.001	
Xylenes (Total)	05-17-95	<0.001	0.169	0.008	<0.001	<0.001	<0.001	0.62
	11-14-95	<0.001	0.406	0.011	0.013	<0.001	0.001	
	01-17-96	0.001	**1.050**	0.047	0.031	<0.001	<0.001	
	04-24-96	<0.001	0.127	0.076	<0.002	<0.001	<0.001	

Analyses performed by Trace Analysis, Inc. Lubbock, Texas.
All samples analyzed for BTEX using EPA Method 8020 except for samples obtained on May 17, 1995 (analyzed using EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

Table 3
Summary of BTEX Analytical Results For Duplicate and Rinsate Samples
Linam Ranch Plant - EOTT Tanks

Constituent	Date	MW-10 (mg/l)	MW-11 (mg/l)	Rinsate (mg/l)	WQCC Standards (mg/l)
Benzene	01-17-96[1]	**6.510**	NA	<0.001	0.010
	01-17-96[2]	**6.020**	**0.526**	NA	
	04-24-96[1]	**7.360**	NA	<0.001	
Toluene	01-17-96[1]	**0.898**	NA	<0.001	0.75
	01-17-96[2]	**0.985**	<0.01	NA	
	04-24-96[1]	<0.010	NA	<0.001	
Ethylbenzene	01-17-96[1]	**1.160**	NA	<0.001	0.75
	01-17-96[2]	**1.260**	<0.01	NA	
	04-24-96[1]	**1.260**	NA	<0.001	
Xylenes (Total)	01-17-96[1]	**1.150**	NA	<0.001	0.62
	01-17-96[2]	**1.190**	<0.01	NA	
	04-24-96[1]	0.141	NA	<0.001	

All samples analyzed for BTEX using EPA Method 8020.
1 Samples analyzed by Trace Analysis, Inc. (Lubbock, Texas).
2 Samples analyzed by Inchcape Testing Services (Richardson, Texas).
NA Not analyzed.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

Table 4
Summary of Metal Analytical Results
Linam Ranch Plant - EOTT Tanks

Constituent	Date	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	WQCC Standards (mg/l)
Aluminum (Al)	05-17-95	**26.58**	4.79	3.99	2.14	**5.35**	**14.08**	5.0
	04-24-96	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Arsenic (As)	05-17-95	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
	04-24-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Barium (Ba)	05-17-95	0.30	0.18	0.17	0.10	0.13	0.59	1.0
	04-24-96	<0.2	0.5	<0.2	<0.2	<0.2	0.2	
Boron (B)	05-17-95	0.20	0.16	0.10	0.33	0.16	0.16	0.75
	04-24-96	<0.03	0.04	<0.03	0.08	0.09	<0.03	
Cadmium (Cd)	05-17-95	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01
	04-24-96	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Cobalt (Co)	05-17-95	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05
	04-24-96	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Copper (Cu)	05-17-95	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.0
	04-24-96	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	
Chromium (Cr)	05-17-95	**0.06**	0.02	0.02	0.05	0.03	<0.01	0.05
	04-24-96	<0.05	<0.05	<0.05	<0.03	<0.05	<0.05	
Iron (Fe)	05-17-95	**12.08**	**3.05**	**2.88**	**1.34**	**2.80**	**7.02**	1.0
	04-24-96	<0.03	0.26	0.22	0.13	<0.03	<0.03	
Lead (Pb)	05-17-95	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.05
	04-24-96	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Manganese (Mn)	05-17-95	0.15	**0.41**	**0.25**	0.15	0.07	0.11	0.2
	04-24-96	<0.01	**0.93**	0.17	0.08	<0.01	<0.01	
Mercury (Hg)	05-17-95	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
	04-24-96	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	
Molybdenum (Mo)	05-17-95	<0.05	0.06	0.08	0.06	0.06	0.07	1.0
	04-24-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Nickel (Ni)	05-17-95	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.2
	04-24-96	0.002	0.004	0.006	<0.001	0.023	0.006	
Selenium (Se)	05-17-95	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.05
	04-24-96	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Silver (Ag)	05-17-95	<0.01	<0.01	<0.01	<0.01	<0.01	**0.18**	0.05
	04-24-96	<0.01	0.01	<0.01	0.02	<0.01	<0.01	
Zinc (Zn)	05-17-95	0.07	0.07	0.04	0.06	0.04	0.05	10.0
	04-24-96	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	

Analyses performed by Trace Analysis, Inc. using EPA Methods 200.7, 239.2, 270.2, and 272.2
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Bold values indicate concentrations exceed WQCC groundwater standards.
Samples were not filtered on 05-17-95, therefore results indicate total (dissolved and undissolved) metal concentrations.
Samples were filtered with a 45 μm element on 04-24-96, therefore results indicate dissolved metal concentrations.

Table 5
Summary of Major Cation and Anion Analytical Results
Linam Ranch Plant - EOTT Tanks

Constituent	Date	MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	WQCC Standards (mg/l)
Total Dissolved Solids (TDS)	05-17-95 04-24-96	602 579	903 909	707 861	890 963	**1,128** 736	629 667	1,000
Calcium (Ca)	05-17-95 04-24-96	162 101	217 117	171 131	249 133	274 122	158 117	NS
Fluoride (F)	05-17-95 04-24-96	0.5 0.57	0.7 0.62	0.6 0.67	0.5 0.47	0.7 0.59	0.6 0.50	1.6
Magnesium (Mg)	05-17-95 04-24-96	18.2 12.3	37.6 29.9	22.0 20.7	26.8 21.7	37.2 18.7	20.3 17.2	NS
Sodium (Na)	05-17-95 04-24-96	52.7 44.2	89.2 118	61.4 59.0	71.5 110	132.2 59.3	68.9 48.8	NS
Bicarbonate (HCO_3)	05-17-95 04-24-96	283 286	414 660	303 648	419 553	494 420	277 330	NS
Chloride (Cl)	05-17-95 04-24-96	73 58	98 72	59 72	49 28	225 91	137 96	250
Nitrate (NO_3-N)	05-17-95 04-24-96	4.7 0.2	1.03 <0.1	0.63 <0.1	**28.6** 1.9	1.01 <0.1	5.0 0.2	10.0
Sulfate (SO_4)	05-17-95 04-24-96	126 60	184 16	232 21	190 124	206 53	99 46	600

Analyses performed by Trace Analysis, Inc. using EPA Methods 160.1, 200.7, 340.2, 375.4, 353.3, 4500 C1-B, and 310.1
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
NS Indicates no standard established or applicable.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

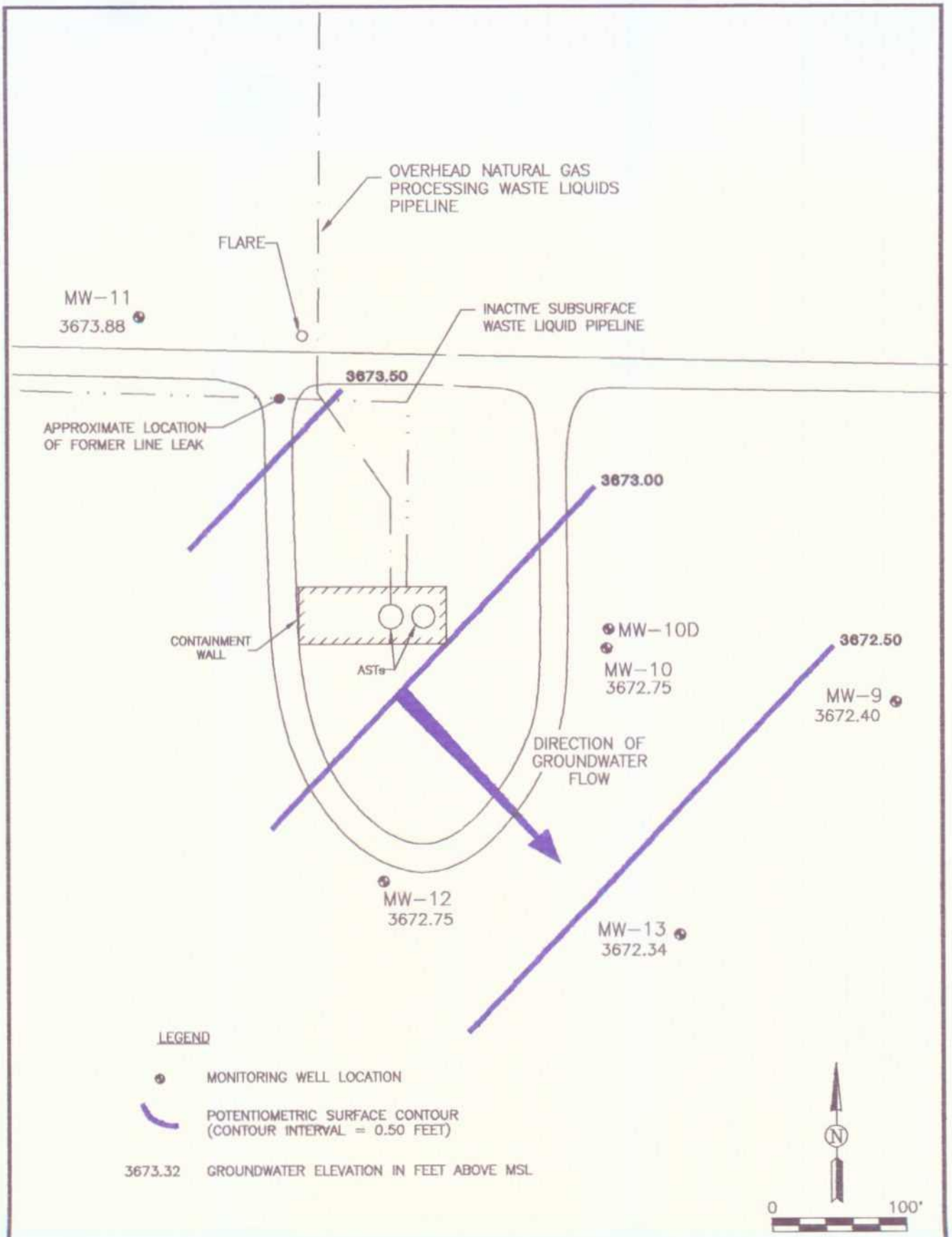
Table 6
Summary of Groundwater Analytical Results for Bacterial Activity
Linam Ranch Plant - EOTT Tanks

Constituent	Date	Monitoring Well Numbers				
		MW-9	MW-10	MW-11	MW-12	MW-13
Total Aerobic Bacteria Population (cfu/ml)	05-17-95	NA	2,700,000	930,000	640,000	NA
	11-14-95	NA	31,000	26,000	NA	17,000
	01-17-96	NA	138,000	106,000	NA	780,000
	04-24-96	NA	146,000	450,000	NA	300,000
Total Hydrocarbon Degraders (cfu/ml)	05-17-95	NA	78,000	480,000	450,000	NA
	11-14-95	NA	6,800	5,400	NA	550
	01-17-96	NA	153,000	297,000	NA	133,000
	04-24-96	NA	43,700	23,000	NA	20,700
Dissolved oxygen (mg/l)	05-17-95	1.85	1.05	1.05	0.97	1.51
	11-14-95	2.82	1.98	2.30	3.15	5.00
	01-17-96	5.3	5.0	2.8	1.7	2.0
	04-24-96	2.0	1.6	2.0	1.8	2.6
Nitrate-NO_3 (mg/l)	05-17-95	4.70	1.03	28.6	1.01	5.00
	11-14-95	NA	< 0.01	1.56	NA	0.02
	01-17-96	NA	< 0.5	43.3	NA	6.54
	04-24-96	0.2	<0.1	1.9	<0.1	0.2
Sulfate-SO_4 (mg/l)	05-17-95	126	184	190	206	99
	11-14-95	NA	174	184	NA	44
	01-17-96	NA	40	150	NA	42
	04-24-96	60	16	124	53	46

Analyses performed by Trace Analysis, Inc. with assistance from the Biological Sciences Department of Texas Tech University using modified standard plate count methods (Appendix D).
Total Aerobic Bacteria Population equivalent to Total Aerobic Heterotrophic Plate Count.
Total Hydrocarbon Degraders equivalent to Total Hydrocarbon Utilizing Bacteria.
Bacteria population counts reported in colony forming units per milliliter (cfu/ml).
Dissolved oxygen obtained using a ICM Model 31250 dissolved oxygen meter or comparable model.

ATTACHMENT B

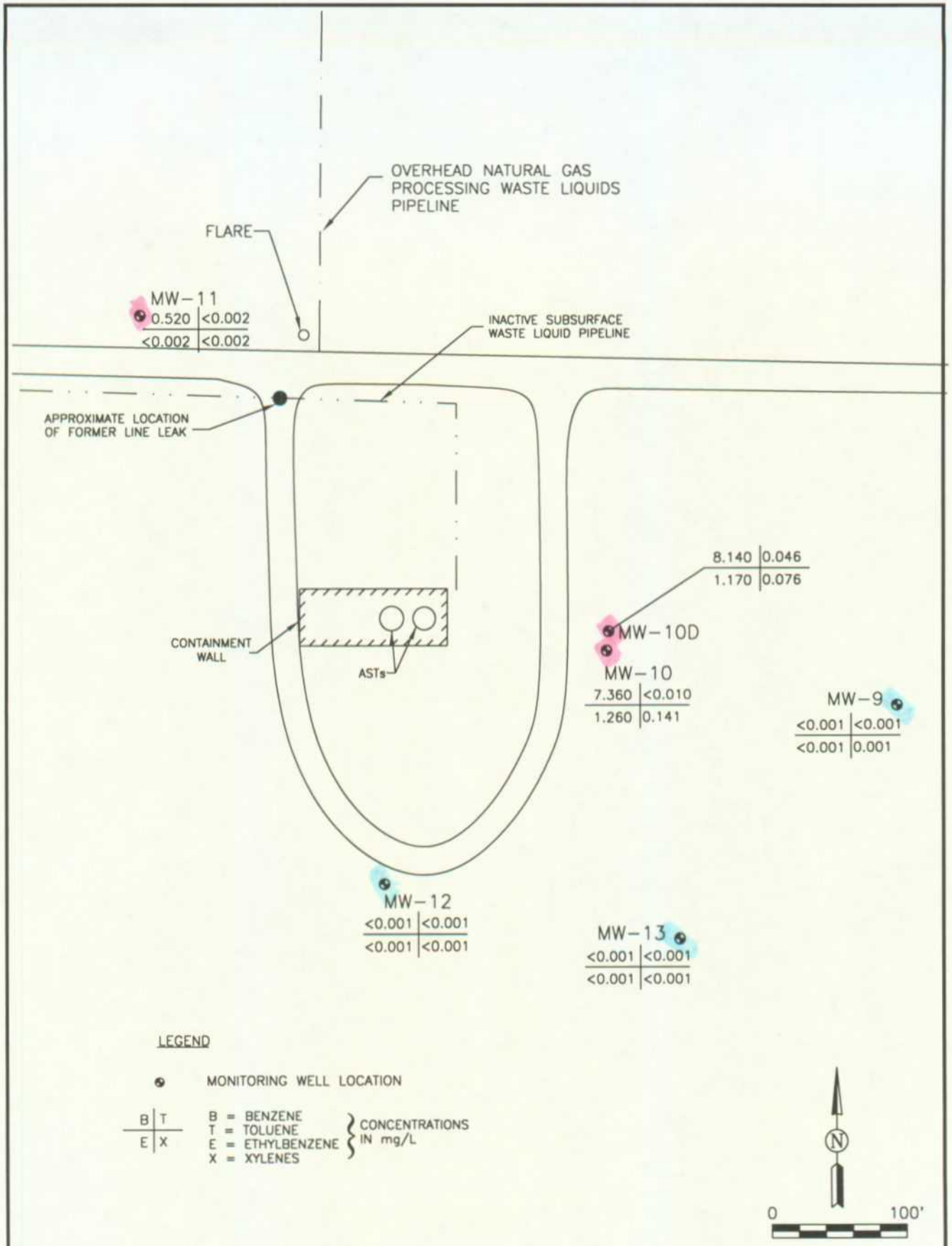
FIGURES



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 04/24/96	REV. NO.: 0
AUTHOR: GJV	DRAWN BY: RG
CK'D BY: RTH	FILE: LNMRCH01

FIGURE 1
LINAM RANCH PLANT
POTENTIOMETRIC SURFACE MAP



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 4/24/96	REV. NO.: 1
AUTHOR: GJV	DRN BY: MP021596
CK'D BY: RTH	FILE: LNMRCH03

FIGURE 2
LINAM RANCH PLANT
BTEX CONCENTRATION MAP

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS

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

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suit 1100
Albuquerque, NM 87102

April 29, 1996
Receiving Date: 04/25/96
Sample Type: Water
Charge Code No: LREOTT20300
Project Location: Linam Ranch Plant
COC# 10170

Prep Date: 04/25/96
Analysis Date: 04/25/96
Sampling Date: 04/24/96
Sample Condition: I & C
Sample Received by: SH
Project Name: Linam Ranch Plant

TA#	FIELD CODE		MTBE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL-BENZENE (ug/L)	M,P,O XYLENE (ug/L)	TOTAL BTEX (ug/L)
T51574	9604240745	MW-12	<1	<1	<1	<1	<1	<1
T51575	9604240840	MW-13	<1	<1	<1	<1	<1	<1
T51576	9604240950	MW-9	<1	<1	<1	<1	<1	<1
T51577	9604241100	MW-10	<10	6,940	<10	1,190	127	8,257
T51578	9604241130	MW-10L	<10	7,360	<10	1,260	141	8,761
T51579	9604241205	MW-10d	<10	8,140	46	1,170	76	9,432
T51580	9604241230	Rinsate	<1	<1	<1	<1	<1	<1
T51581	9604241315	MW-11	<2	520	<2	<2	<2	520
T51582	9604241345	Trip Blank	<1	<1	<1	<1	<1	<1
QC	Quality Control		99	104	103	101	191	
Reporting Limit			1	1	1	1	1	
RPD			2	1	1	3	2	
% Extraction Accuracy			97	103	102	100	96	
% Instrument Accuracy			99	104	103	101	96	

METHODS: EPA SW 846-5030, 8020.
CHEMIST: McD
MTBE/BTEX SPIKE AND QC: 100 ug/L MTBE/BTEX.

BS

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

4-29-96
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Anette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 15, 1996
Receiving Date: 04/25/96
Sample Type: Water
Charge Code: LREOTT20300
Project Location: Linam Ranch Plant
COC# 10170

Extraction Date: 04/25/96
Analysis Date: 04/25/96
Sampling Date: 04/24/96
Sample Condition: I & C
Sample Received by: SH
Project Name: Linam Ranch Plant

TA#	FIELD CODE	CHLORIDE (mg/L)	SULFATE (mg/L)	TDS (mg/L)	FLUORIDE (mg/L)	(NO3-NO2)-N (mg/L)	ALKALINITY (mg/L as CaCo3) HCO3	CO3
T51574	9604240745 MW-12	91	53	736	0.59	<0.1	420	0
T51575	9604240840 MW-13	96	46	667	0.50	0.2	330	0
T51576	9604240950 MW-9	58	60	579	0.57	0.2	286	0
T51577	9604241100 MW-10	72	16	909	0.62	<0.1	660	0
T51579	9604241205 MW-10d	72	21	861	0.67	<0.1	648	0
T51581	9604241315 MW-11	28	124	963	0.47	1.9	553	0
QC	Quality Control	500	9.8	---	1.01	0.99	---	---
REPORTING LIMIT		0.5	1.0	---	0.1	0.1	---	---
RPD		1	6	4	1	1	5	5
% Extraction Accuracy		98	101	---	100	97	---	---
% Instrument Accuracy		100	96	---	101	100	---	---

METHODS: EPA SM 4500 Cl-B, 375.4, 160.1, 340.2, 353.3, 310.1.
CHEMIST: Chloride: JT Sulfate,TDS, Fluoride: MS (NO3-NO2)-N: JW/MS Alkalinity: RCD
CHLORIDE SPIKE AND QC: 500 mg/L CHLORIDE.
SULFATE SPIKE AND QC: 10.0 mg/L SULFATE.
FLUORIDE SPIKE AND QC: 1.0 mg/L FLUORIDE.
(NO3-NO2)-N SPIKE: 1.33 mg/L (NO3-NO2)-N.
(NO3-NO2)-N QC: 1.0 mg/L (NO3-NO2)-N.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-15-96
DATE

TRACEANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

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

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Anette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 23, 1996
Receiving Date: 04/25/96
Sample Type: Water
Charge Code: LREOTT20300
Project Location: Linam Ranch Plant
COC# 10170

Extraction Date: 04/26/96
Analysis Date: 05/12/96
Sampling Date: 04/24/96
Sample Condition: I & C
Sample Received by: SH
Project Name: Linam Ranch Plant

DISSOLVED METALS (mg/L)

TA#	Field Code		As	Se	Cd	Cr	Co	Cu	Fe	Mn	Mo	Ni	Zn	Hg	Al	Ba	B	Pb	Ag
T51574	9604240745	MW-12	<0.1	<0.1	<0.02	<0.05	<0.03	<0.02	<0.03	<0.01	<0.1	0.023	<0.02	<0.001	<0.2	<0.2	0.09	<0.001	<0.01
T51575	9604240840	MW-13	<0.1	<0.1	<0.02	<0.05	<0.03	<0.02	<0.03	<0.01	<0.1	0.006	<0.02	0.002	<0.2	0.2	<0.03	<0.001	<0.01
T51576	9604240950	MW-9	<0.1	<0.1	<0.02	<0.05	<0.03	<0.02	<0.03	<0.01	<0.1	0.002	<0.02	<0.001	<0.2	<0.2	<0.03	<0.001	<0.01
T51577	9604241100	MW-10	<0.1	<0.1	<0.02	<0.05	<0.03	<0.02	0.26	0.93	<0.1	0.004	<0.02	<0.001	<0.2	0.5	0.04	<0.001	0.01
T51579	9604241205	MW-10d	<0.1	<0.1	<0.02	<0.05	<0.03	<0.02	0.22	0.17	<0.1	0.006	<0.02	<0.001	<0.2	<0.2	<0.03	<0.001	<0.01
T51581	9604241315	MW-11	<0.1	<0.1	<0.02	<0.05	<0.03	0.03	0.13	0.08	<0.1	<0.001	<0.02	<0.001	<0.2	<0.2	0.08	<0.001	0.02
QC	Quality Control		1.86	1.86	1.94	1.95	1.99	1.99	1.95	1.97	1.93	0.025	1.97	0.0050	2.2	3.7	4.28	0.025	0.06
Reporting Limit			0.1	0.1	0.02	0.05	0.03	0.02	0.03	0.01	0.1	0.001	0.02	0.001	0.2	0.2	0.03	0.001	0.01
RPD			3	1	1	3	0	0	2	1	3	10	1	6	1	59	2	20	1[illegible]
% Extraction Accuracy			111	89	77	93	103	97	110	107	106	115	113	97	122	93	83	108	120
% Instrument Accuracy			93	93	97	98	100	100	98	99	97	100	99	100	110	105	86	98	119

METHODS: EPA SW 846-3005, 6010, 7470, 7421, 7521.
CHEMIST: RR/CB/RC/JT
TOTAL METALS SPIKE: 8.0 mg/L As, Se, Al; 0.2 mg/L Cd; 0.8 mg/L Cr; 200 mg/L Ca; 2.0 mg/L Co, Mn, Mo, Zn, B; 0.020 mg/L Ni, Pb; 1.0 mg/L Cu; 4.0 mg/L Fe, Ba; 0.05 mg/L Ag; 0.0050 mg/L Hg.
TOTAL METALS QC: 2.0 mg/L As, Se, Cd, Cr, Co, Cu, Fe, Mn, Mo, Zn, Ba, Al; 0.025 mg/L Pb; 0.05 mg/L Ba; 5.0 mg/L B; 0.025 mg/L Ni; 0.0050 mg/L Hg.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

7-2-96
Date

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

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Anette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 23, 1996
Receiving Date: 04/25/96
Sample Type: Water
Charge Code: LREOTT20300
Project Location: Linam Ranch Plant
COC# 10170

Extraction Date: 04/26/96
Analysis Date: 05/12/96
Sampling Date: 04/24/96
Sample Condition: I & C
Sample Received by: SH
Project Name: Linam Ranch Plant

TA#	Field Code		DISSOLVED POTASSIUM (mg/L)	MAGNESIUM (mg/L)	CALCIUM (mg/L)	SODIUM (mg/L)
T51574	9604240745	MW-12	2.9	18.7	122	59.3
T51575	9604240840	MW-13	2.6	17.2	117	48.8
T51576	9604240950	MW-9	2.2	12.3	101	44.2
T51577	9604241100	MW-10	1.9	29.9	117	118
T51579	9604241205	MW-10d	2.7	20.7	131	59.0
T51581	9604241315	MW-11	2.9	21.7	133	110
QC	Quality Control		20.0	20.3	18.6	19.8
Reporting Limit			0.3	0.01	0.01	0.4
RPD			14	2	2	6
% Extraction Accuracy			102	90	94	81
% Instrument Accuracy			100	101	93	99

METHODS: EPA SW 846-3005, 6010.
CHEMIST: RR
SPIKE: 100.0 mg/L POTASSIUM, MAGNESIUM, CALCIUM, SODIUM.
QC: 20.0 mg/L POTASSIUM, MAGNESIUM, CALCIUM, SODIUM.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-30-96
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

May 30, 1996
Receiving Date: 04/25/96
Sample Type: Water
Charge Code No: LREOTT20300
Project Location: Linam Ranch Plant
COC# 10170

Prep Date: 05/21/96
Analysis Date: 05/21/96
Sampling Date: 04/24/96
Sample Condition: I & C
Sample Received by: SH
Project Name: Linan Ranch Plant

TA#	FIELD CODE		HPC (CFU/ml)	HUB (CFU/ml)
T51575	9604240840	MW-13	3.00 x 10E5	2.07 x 10E4
T51577	9604241100	MW-10	1.46 x 10E5	4.37 x 10E4
T51581	9604241315	MW-11	4.50 x 10E5	2.30 x 10E4

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

5-30-96
DATE

TRACEANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

SD 4-5A

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116AG

DISN 111 1

GCL
Environmental Science and Engineering
A BDM International Company

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☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 10170

Chain of Custody

Date 4/24/96 Page 1 Of 1

Lab Name TRACE ANALYSIS
Address 6701 ABERDEENE AVENUE
LUBBOCK, TEXAS 79424
Telephone (806) 794-1296

Samplers (SIGNATURES) D Nee

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	TPH/BTEX Modified 8015	TCLP- Vol., Semi-Vol. Herbicides, Pesticides	TCLP- Metals	~~Total~~ Dissolved Metals*	Priority Pollutant Metals (13)	CAM Metals (18) TTLC/STLC	Flash Point	Corrosivity	Reactivity	Oil & Grease	Cyanide Total/Amenable	Chemical Oxygen Demand (COD)	HVG/HPC	NO3	Major Cations/Anions	F Cl Br SO4	Number of Containers
515	9604240745	H2O	MW-12		2												1									+ DN	1°	1°		5
75	9604240840	H2O	MW-13		2												1									1°	1°	1°		6
76	9604240950	H2O	MW-9		2												1										1°	1°		5
77	9604241100	H2O	MW-10		2												1									1°	1°	1°		6
78	9604241130	H2O	MW-10L		2												+ DN													2
79	9604241205	H2O	MW-10d		2												1										1°	1°		5
80	9604241230	H2O	Rinsate		2																									2
81	9604241315	H2O	MW-11		2												1									1°	1°	1°		6
	9604241345	H2O	TripBlank		1																									1

Project Information	
Project	Linam Ranch Plant
Project Director	GIL VANDerenter
Charge Code No.	LREOTT20200
Shipping ID. No.	
Via:	Grey Hound

Sample Receipt	
Total No. of Containers	38
Chain of Custody Seals	✓
Rec'd Good Condition/Cold	✓
Conforms to Record	✓
Lab No.	

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
D Nee (Signature) 1400 (Time)	(Signature) (Time)	(Signature) (Time)
DAVID NEE (Printed Name) 4/24/96 (Date)	(Printed Name) (Date)	(Printed Name) (Date)
GL (Company)	(Company)	(Company)

Received By 1.	Received By 2.	Received By (Laboratory) 3.
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	Shawn Hariaek 9:30 (Printed Name) (Date)
(Company)	(Company)	Trace Analysis 4-25-96 (Laboratory)

F 5-31-96

Special Instructions/Comments:
Fax Results to GCL Midland (915 682 0028)
Please invoice GPM Direct

(Scott Seaby) Na Ca Mg Cl F SO_4 CO_3 HCO_3 TDS NO_3

Distribution: White, Canary-Laboratory • Pink, GCL

• Dissolved Metals, Al As Ba B Cd Co Cu Cr Fe Pb Mn Hg Mo Ni Se Ag Zn

GCL 574W, KS (348)

GPM GAS CORPORATION
4044 PENBROOK
ODESSA, TX 79762

April 25, 1996

Mr. William Olson - Hydrogeologist
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 South Pacheco
State Land Office Building
Santa Fe, New Mexico 87505

RE: FIRST QUARTER 1996 SAMPLING EVENT
LINAM RANCH PLANT - EOTT TANKS
LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

GPM Gas Corporation (GPM) has completed the first quarter 1996 groundwater sampling and monitoring operations at the above-referenced site in accordance with the requirements specified in your letter dated October 19, 1995. Sampling and monitoring activities were conducted by Geoscience Consultants, Ltd. (GCL).

PROCEDURES

Prior to sampling the monitoring wells near the EOTT tanks (MW-9 through MW-13) were gauged for depth to groundwater on January 17, 1996 using an electronic water level indicator. Immediately prior to collecting groundwater samples, each monitoring well was purged of a minimum of three well casing volumes of development water using a decontaminated 2-inch diameter submersible pump (Grundfos Redi-Flo2), with the exception of the 2-inch diameter monitoring wells (MW-9 and MW-10D), which were purged using clean, decontaminated PVC bailers. A total of approximately 166 gallons of water was purged from monitoring wells MW-9 through MW-13. Groundwater samples were obtained using a new, decontaminated, disposable bailers for each well after purging. Groundwater parameters, including pH, conductivity, temperature, and dissolved oxygen were monitored during purging. Groundwater samples were collected after these parameters stabilized over 3 successive readings.

The water samples were transferred into air-tight, septum-sealed, 40-ml glass VOA sample vials with zero head space for analysis of total benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020. Samples were submitted to Trace Analysis, Inc. of Lubbock, Texas for laboratory analysis. Two duplicate samples were sent to Inchcape Testing Services in Richardson, Texas for BTEX analysis. Additional groundwater samples were collected from monitoring wells MW-10, MW-11, and MW-13 and sent to Trace Analysis, Inc. for analysis of nitrate (NO_3), sulfate (SO_4), total aerobic heterotrophic plate count (HPC), and total hydrocarbon utilizing bacteria (HUB), to assess the efficacy of intrinsic bioremedial activity currently taking place. 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 the laboratories.

GROUNDWATER GRADIENT

Based on the gauging measurements conducted on January 17, 1996, the water table elevation has not fluctuated significantly since previous measurements obtained in November 1995. Depth to groundwater occurs at approximately 48 feet below ground surface. The direction of groundwater flow is to the southeast with a hydraulic gradient of approximately 0.003 ft/ft, which is consistent with determinations made from previous gauging events.

Groundwater elevations for the current and previous monitoring events are summarized in Table 1 (Attachment A). A map that depicts the elevation of the potentiometric surface (groundwater table) and direction of groundwater flow is illustrated in Figure 1 (Attachment B). No free product (pipeline waste liquids) was observed in monitoring wells MW-9 through MW-13 during sampling activities.

ANALYTICAL RESULTS

Groundwater sample analytical results for the current and previous sampling events are presented in Tables 2, 3, and 4. The New Mexico Water Quality Control Commission (WQCC) standards are presented in Table 2 and 3 for comparison. Constituents with concentrations above the WQCC standards are highlighted in boldface type. The laboratory reports and COC documentation are included in Attachment C. The most recent total dissolved BTEX concentrations are depicted graphically on Figure 2.

BTEX concentrations in monitoring wells MW-9, MW-12, and MW-13 have remained consistent compared to the previous groundwater sampling data conducted on November 14, 1995. Dissolved BTEX concentrations in these monitoring wells have remained close to or below the laboratory detection limit of 0.001 mg/l (Table 2) and below WQCC standards.

Benzene concentrations of 6.110 mg/l, 0.841 mg/l, and 0.549 mg/l in MW-10, MW-10D, and MW-11 respectively, continue to exceed the WQCC standards of 0.010 mg/l. Toluene, ethylbenzene, and xylene concentrations of 0.863 mg/l, 1.140 mg/l, and 1.050 mg/l, respectively, were observed in MW-10, which exceed the WQCC standards of 0.75 mg/l, 0.75 mg/l, and 0.62 mg/l, respectively.

Since benzene concentrations in the upgradient monitoring well (MW-11) have increased from less than the laboratory detection limit of 0.001 mg/l in May to 0.306 mg/l in November 1995, duplicate samples were obtained during the current sampling event to determine if that increase was the result of cross-contamination. The duplicate sample results (Table 3) confirm that the increased benzene concentrations in MW-11 reflects groundwater quality in that well and is not from cross-contamination.

The results for dissolved oxygen (DO), nitrate (NO_3), sulfate (SO_4), total aerobic heterotrophic plate count (HPC), total hydrocarbon utilizing bacteria (HUB) are summarized in Table 4. While intrinsic

bioremediation is occurring, additional monitoring and sampling data will be required to evaluate its effectiveness in limiting the migration or elimination of the dissolved hydrocarbon plume.

CONCLUSIONS

- Benzene was the only constituent that exceeded the New Mexico Water Quality Control Commission standards (NMWQCC) of 0.010 mg/l, in MW-10, MW-10D, and MW-11. The toluene, ethylbenzene, and total xylenes in MW-10 also exceeded WQCC standards.

- No free product (pipeline waste liquids) was observed in monitoring wells MW-9 through MW-13 during sampling activities.

- The hydrocarbon-impacted groundwater from the EOTT tank and line leak sources has not migrated off site, and remains well within the boundaries of the facility.

GPM will conduct second quarter sampling and monitoring operations in May 1996. If you have any questions regarding this project please call me at 915-368-1142.

Sincerely,

Scott Seeby
Environmental Engineer
New Mexico Region

Attachments

cc: M. S. Nault, GPM-Linam Ranch Plant, NM
Jerry Sexton, OCD-Hobbs, NM
Gilbert J. Van Deventer, GCL-Midland,TX (w/o attachments)

ATTACHMENTS

ATTACHMENT A

TABLES

Table 1
Summary of Groundwater Elevations
Linam Ranch Plant - EOTT Tanks

Well	Date	Relative Ground Surface Elevations (feet)	Relative Top of Casing Elevation (feet)*	Depth to Groundwater Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)	Phase-Separated Hydrocarbon Thickness (feet)
MW-9	05-17-95	3720.48	3722.48	50.60	3671.88	0.00
	11-14-95	3720.48	3722.48	50.02	3672.46	0.00
	01-17-96	3720.48	3722.48	49.84	3672.64	0.00
MW-10	05-17-95	3720.76	3722.90	50.45	3672.45	0.00
	11-14-95	3720.76	3722.90	49.85	3673.05	0.00
	01-17-96	3720.76	3722.90	49.82	3673.08	0.00
MW-10D	05-17-95	3720.85	3723.54	51.38	3672.16	0.00
	11-14-95	3720.85	3723.54	50.63	3672.91	0.00
	01-17-96	3720.85	3723.54	50.73	3672.81	0.00
MW-11	05-17-95	3722.02	3724.53	51.50	3673.03	0.00
	11-14-95	3722.02	3724.53	50.34	3674.19	0.00
	01-17-96	3722.02	3724.53	50.65	3673.88	0.00
MW-12	05-17-95	3720.60	3722.84	50.47	3672.37	0.00
	11-14-95	3720.60	3722.84	49.52	3673.32	0.00
	01-17-96	3720.60	3722.84	49.59	3673.25	0.00
MW-13	05-17-95	3721.63	3723.99	51.97	3672.02	0.00
	11-14-95	3721.63	3723.99	51.42	3672.57	0.00
	01-17-96	3721.63	3723.99	51.33	3672.66	0.00

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

Groundwater gradient direction is towards the southeast with a hydraulic gradient of approximately 0.003 feet/feet.

Table 2
Summary of Dissolved BTEX Results
Linam Ranch Plant - EOTT Tanks

Constituent	Date	Monitoring Well Numbers						WQCC Standards (mg/l)
		MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	
Benzene	05-17-95	<0.001	**3.225**	**0.096**	<0.001	<0.001	<0.001	0.010
	11-14-95	<0.001	**5.230**	**0.125**	**0.306**	<0.001	0.003	
	01-17-96	0.001	**6.110**	**0.841**	**0.549**	<0.001	<0.001	
Toluene	05-17-95	<0.001	0.052	0.004	<0.001	<0.001	<0.001	0.75
	11-14-95	<0.001	0.001	0.001	<0.001	<0.001	<0.001	
	01-17-96	<0.001	**0.863**	0.001	0.004	<0.001	<0.001	
Ethylbenzene	05-17-95	<0.001	0.049	<0.001	<0.001	<0.001	<0.001	0.75
	11-14-95	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	01-17-96	<0.001	**1.140**	<0.001	0.002	<0.001	<0.001	
Xylenes (Total)	05-17-95	<0.001	0.169	0.008	<0.001	<0.001	<0.001	0.62
	11-14-95	<0.001	0.406	0.011	0.013	<0.001	0.001	
	01-17-96	0.001	**1.050**	0.047	0.031	<0.001	<0.001	

Analyses performed by Trace Analysis, Inc. Lubbock, Texas.
All samples analyzed for BTEX using EPA Method 8020 except for samples obtained on May 17, 1995 (analyzed using EPA Method 8240).
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

Table 3
Summary of BTEX Results For Duplicate and Rinsate Samples
Linam Ranch Plant - EOTT Tanks
Samples Obtained on January 17, 1996

Constituent	Laboratory	Monitoring Well Numbers			WQCC Standards (mg/l)
		MW-10 (mg/l)	MW-11 (mg/l)	Rinsate (mg/l)	
Benzene	Trace[1]	**6.110**	**0.549**	<0.001	0.010
	Trace[2]	**6.510**	NA	NA	
	Inchcape[2]	**6.020**	**0.526**	NA	
Toluene	Trace[1]	**0.863**	0.004	<0.001	0.75
	Trace[2]	**0.898**	NA	NA	
	Inchcape[2]	**0.985**	<0.01	NA	
Ethylbenzene	Trace[1]	**1.140**	0.002	<0.001	0.75
	Trace[2]	**1.160**	NA	NA	
	Inchcape[2]	**1.260**	<0.01	NA	
Xylenes (Total)	Trace[1]	**1.050**	0.031	<0.001	0.62
	Trace[2]	**1.150**	NA	NA	
	Inchcape[2]	**1.190**	<0.01	NA	

All samples analyzed for BTEX using EPA Method 8020.
1 Original sample results.
2 Duplicate sample results.
NA Not analyzed.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

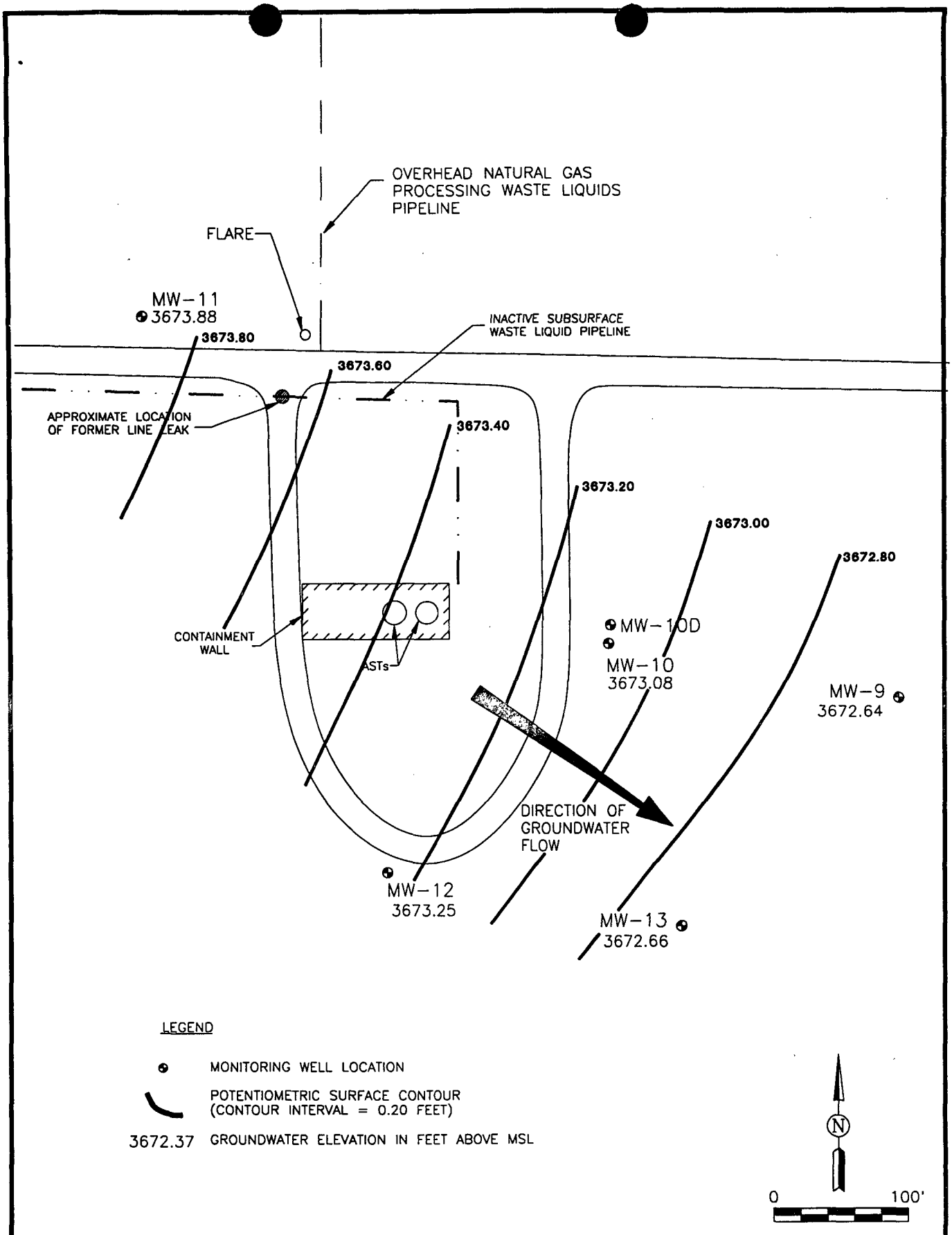
Table 4
Summary of Groundwater Analytical Results for Bacterial Activity
Linam Ranch Plant - EOTT Tanks

Constituent	Date	Monitoring Well Numbers				
		MW-9	MW-10	MW-11	MW-12	MW-13
Total Aerobic Bacteria Population (cfu/ml)	05-17-95	NA	2,700,000	930,000	640,000	NA
	11-14-95	NA	31,000	26,000	NA	17,000
	01-17-96	NA	138,000	106,000	NA	780,000
Total Hydrocarbon Degraders (cfu/ml)	05-17-95	NA	78,000	480,000	450,000	NA
	11-14-95	NA	6,800	5,400	NA	550
	01-17-96	NA	153,000	297,000	NA	133,000
Dissolved oxygen (mg/l)	05-17-95	1.85	1.05	1.05	0.97	1.51
	11-14-95	2.82	1.98	2.30	3.15	5.00
	01-17-96	5.3	5.0	2.8	1.7	2.0
Nitrate-NO_3 (mg/l)	05-17-95	4.70	1.03	28.6	1.01	5.00
	11-14-95	NA	< 0.01	1.56	NA	0.02
	01-17-96	NA	< 0.5	43.3	NA	6.54
Sulfate-SO_4 (mg/l)	05-17-95	126	184	190	206	99
	11-14-95	NA	174	184	NA	44
	01-17-96	NA	40	150	NA	42

Analyses performed by Trace Analysis, Inc. with assistance from the Biological Sciences Department of Texas Tech University using modified standard plate count methods (Appendix D).
Total Aerobic Bacteria Population equivalent to Total Aerobic Heterotrophic Plate Count.
Total Hydrocarbon Degraders equivalent to Total Hydrocarbon Utilizing Bacteria.
Bacteria population counts reported in colony forming units per milliliter (cfu/ml).
Dissolved oxygen obtained using a ICM Model 31250 dissolved oygen meter or comparable model.

ATTACHMENT B

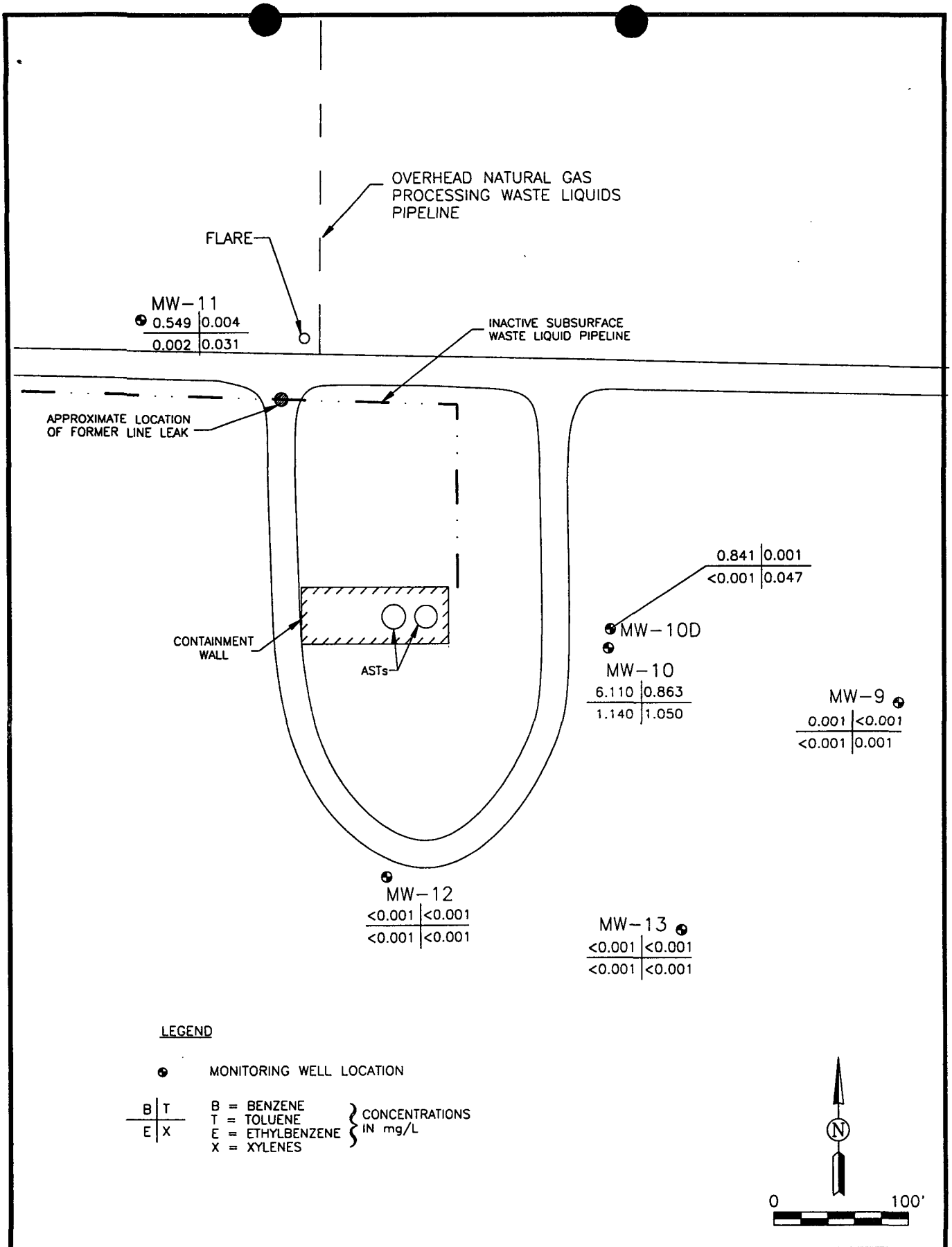
FIGURES



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 1/17/96	REV. NO.: 1
AUTHOR: GJV	DRN BY: MP021596
CK'D BY: LJM	FILE: LNMRCH03

FIGURE 1
LINAM RANCH PLANT
POTENTIOMETRIC SURFACE MAP



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 1/17/96	REV. NO.: 1
AUTHOR: GJV	DRN BY: MP021596
CK'D BY: LJM	FILE: LNMRCH03

FIGURE 2
LINAM RANCH PLANT
BTEX CONCENTRATION MAP

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS

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

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suit 1100
Albuquerque, NM 87102

January 22, 1996
Receiving Date: 01/18/96
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: Linam Ranch Plant
COC #9692

Prep Date: 01/18/96
Analysis Date: 01/18/96
Sampling Date: 01/17/96
Sample Condition: I & C
Sample Received by: ML
Project Name: EOTT Tanks

TA#	FIELD CODE	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL-BENZENE (ug/L)	M,P,O XYLENE (ug/L)	TOTAL BTEX (ug/L)
T47013	9601170830 MW-12	<1	<1	<1	<1	<1
T47014	9601170845 Rinsate	<1	<1	<1	<1	<1
T47015	9601170950 MW-13	<1	<1	<1	<1	<1
T47016	9601171130 MW-9	1	<1	<1	1	2
T47017	9601171145 MW-11	549	4	2	31	586
T47018	9601171300 MW-10d	841	1	<1	47	889
T47019	9601171315 MW-10	6,110	863	1,140	1,050	9,163
T47020	9601171345 MW-10s	6,510	898	1,160	1,150	9,718
QC	Quality Control	98	95	97	320	
Reporting Limit		1	1	1	1	
RPD		2	3	2	1	
% Extraction Accuracy		97	92	97	107	
% Instrument Accuracy		98	96	98	107	

METHODS: EPA SW 846-5030, 8020.
BTEX SPIKE AND QC: 100 ug/L BTEX.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

1-22-96
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

January 25, 1996
Receiving Date: 01/18/96
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: Linam Ranch Plant
COC# 9692

Prep Date: 01/22/96
Analysis Date: 01/22/96
Sampling Date: 01/17/96
Sample Condition: I & C
Sample Received by: ML
Project Name: EOTT Tanks

TA#	FIELD CODE	SULFATE (mg/L)	(NO3-NO2)-N (mg/L)
T47015	9601170950 MW - 13	42	6.54
T47017	9601171145 MW - 11	150	43.3
T47019	9601171315 MW - 10	40	<0.5
QC	Quality Control	8	1.01
RPD		15	0
% Extraction Accuracy		105	99
% Instrument Accuracy		83	101
REPORTING LIMIT		1.0	0.5

METHODS: EPA 375.4, 353.3.
SULFATE SPIKE AND QC: 10 mg/L SULFATE.
(NO3-NO2)-N SPIKE: 1.33 mg/L (NO3-NO2)-N.
(NO3-NO2)-N QC: 1.0 mg/L (NO3-NO2)-N.

1-25-96

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

DATE

TRACEANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

March 14, 1996
Receiving Date: 01/18/96
Sample Type: Water
Charge Code No: LROETT-20-300
Project Location: Linam Ranch Plant
COC #9692

Prep Date: 02/02.23/96
Analysis Date: 02/02,23/96
Sampling Date: 01/17/96
Sample Condition: I & C
Sample Received by: ML
Project Name: EOTT Tanks

TA#	FIELD CODE		HPC (CFU/ml)	HUB (CFU/ml)
T47015	9601170950	MW-13	1.33 x 10E5	7.8 x 10E5
T47017	9601171145	MW-11	2.97 x 10E5	1.06 x 10E5
T47019	9601171315	MW-10	1.53 x 10E5	1.38 x 10E5

BS

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

3-28-96
DATE

TRACEANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

GCL
Environmental Science and Engineering
A BDM International Company

☑ Albuquerque
505 Marquette NW, Ste. 1100
Albuquerque, NM 87102
(505) 842-0001
FAX: (505) 842-0595

☐ Mid Atlantic Region
4221 Forbes Blvd., Ste. 240
Lanham, MD 20706-4325
(301) 459-9677
FAX: (301) 459-3064

☐ NASA-WSTF
PO Drawer MM
Las Cruces, NM 88004
(505) 524-5353
FAX: (505) 524-5315

№ 9692

Chain of Custody

Date 1/17/96 Page 1 Of 1

Lab Name TRACE ANALYSIS
Address 6701 ABERDEENE AVENUE
LUBBOCK, TEXAS 79424
Telephone (806) 794-1296

Samplers (SIGNATURES) D Nee

Analysis Request

	Sample Number	Matrix	Location	Halogenated Volatiles 601/8010	Aromatic Volatiles 602/8020 BTEX	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) 415.9/9060	Total Organic Halides (TOX) 9020	Petroleum Hydrocarbons 418.1	TPH BTEX Modified 8015	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)	HUB	HPC	SO_4	NO_3	Number of Containers
47013	9601170830	H_2O	MW-12		✓																									2
14	9601170845	H_2O	Rinsate		✓																									2
15	9601170950	H_2O	MW-13		✓																					✓	✓	✓	✓	5
16	9601171130	H_2O	MW-9		✓																									2
17	9601171145	H_2O	MW-11		✓																					✓	✓	✓	✓	5
18	9601171300	H_2O	MW-10d		✓																									2
19	9601171315	H_2O	MW-10		✓																					✓	✓	✓	✓	5
20	9601171345	H_2O	MW-10s		✓																									2

Project Information

Project Linam Ranch Plant (EPTT TANKS)
Project Director Gil Van Deventer
Charge Code No. LREOTT-20-300
Shipping ID. No.
Via: Greyhound

Sample Receipt

Total No. of Containers	25
Chain of Custody Seals	✓
Rec'd Good Condition/Cold	✓
Conforms to Record	✓
Lab No.	

Special Instructions/Comments: Bill GPM Direct

18AC

Relinquished By 1.
D Nee 1620
(Signature) (Time)
DAVID NEE 1/17/96
(Printed Name) (Date)
GCL
(Company)

Relinquished By 2.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Relinquished By 3.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Received By 1.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Received By 2.
(Signature) (Time)
(Printed Name) (Date)
(Company)

Received By (Laboratory) 3.
M Lopez 10:00
(Signature) (Time)
M Lopez 1-18-96
(Printed Name) (Date)
Trace Analysis
(Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

18AC

January 5, 1996

GPM GAS SERVICES COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY

Mr. William Olson - Hydrogeologist
New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division
2040 South Pacheco
State Land Office Building
Santa Fe, New Mexico 87505

RE: FOURTH QUARTER 1995 SAMPLING EVENT
LINAM RANCH PLANT - EOTT TANKS
LEA COUNTY, NEW MEXICO

Dear Mr. Olson:

GPM Gas Corporation (GPM) has completed the fourth quarter 1995 groundwater sampling and monitoring operations for the monitoring wells at the above-referenced location in accordance with the requirements specified in your letter dated October 19, 1995. Sampling and monitoring activities were conducted by Geoscience Consultants, Ltd. (GCL).

PROCEDURES

The monitoring wells near the EOTT tanks (MW-9 through MW-13) were gauged for depth to groundwater on November 14, 1995 using an electronic water level indicator.

Immediately prior to collecting groundwater samples, each monitoring well was purged of a minimum of three well volumes development water using a decontaminated 2-inch diameter submersible pump (Grundfos Redi-Flo2), with the exception of the 2-inch diameter monitoring wells (MW-9 and MW-10D), which were purged using disposable bailers. A total of approximately 230 gallons of water was purged from monitoring wells MW-9 through MW-13. In order to collect groundwater samples from the 4-inch wells, the pumping rate of the submersible sampling pump was reduced to approximately 100 milliliters per minute; this methodology ensured that volatile organic constituents would not volatilize during sampling operations. Groundwater samples from the 2-inch wells were obtained using a new, decontaminated, disposable bailer for each well after purging. Field parameters, including pH, conductivity, temperature, and dissolved oxygen monitored during purging, and groundwater samples collected after these parameters stabilized.

The water samples were transferred into air-tight, septum-sealed, 40-ml glass VOA sample vials with zero head space for analysis of total benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020 by Trace Analysis, Inc. of Lubbock, Texas. Additional groundwater samples were collected from monitoring wells MW-10, MW-11, and MW-13 and sent to Trace Analysis, Inc. for analysis of nitrate (NO_3), sulfate (SO_4), total aerobic heterotrophic plate count (HPC), and total hydrocarbon utilizing bacteria (HUB), to assess the efficacy of intrinsic bioremedial activity currently

taking place. Chain-of-custody (COC) forms documenting sample identification numbers, collection times, and delivery times to the laboratory were completed for each set of samples. The water samples were placed in an ice-filled cooler immediately after collection and shipped to the laboratory.

GROUNDWATER GRADIENT

Based on the gauging measurements conducted on November 14, 1995, the water table elevation has risen approximately 0.5 to 1 foot since the previous measurements obtained in May 1995. Depth to groundwater occurs at approximately 48 feet below ground surface. The groundwater gradient direction is to the southeast with a hydraulic gradient of approximately 0.003 ft/ft which is consistent with determinations made from previous gauging events.

Groundwater elevations for the current and previous monitoring events are summarized in Table 1 (Attachment A). A map that depicts the elevation of the potentiometric surface (groundwater table) and direction of groundwater flow is illustrated in Figure 1 (Attachment B). No free product (pipeline waste liquids) was observed in monitoring wells MW-9 through MW-13 during sampling activities.

ANALYTICAL RESULTS

Groundwater sample analytical results for the current and previous sampling events are presented in Tables 2 and 3. The WQCC standards are presented in Table 2 for comparison. Those constituents that recorded concentrations above the WQCC standards are highlighted in boldface type. The laboratory reports and COC are included in Attachment C. The most recent total dissolved BTEX concentrations are depicted graphically on Figure 2.

BTEX concentrations have remained consistent compared to the previous groundwater sampling data conducted on May 17, 1995 with the exception of upgradient monitoring well MW-11, which indicated an increased benzene concentration from less than the laboratory detection limit of 0.001 mg/l in May to 0.306 mg/l in November. Since there was no indication of BTEX concentrations in MW-11 during the drilling activities or first sampling event in May 1995, GPM suspects that cross-contamination may have occurred while the sampling technician collected the water samples from the non-dedicated sampling pump. Future samples will be taken using a new, decontaminated disposable bailer to ensure that cross-contamination will not take place. The groundwater samples obtained from monitoring wells MW-9, MW-12, and MW-13 recorded dissolved BTEX concentrations near or below the laboratory detection limit (Table 2).

Benzene concentrations of 5.230 mg/l, 0.125 mg/l, and 0.306 mg/l for MW-10, MW-10D, and MW-11 respectively, were the only constituents that exceeded the New Mexico Water Quality Control Commission standards (NMWQCC) of 0.010 mg/l.

The results for dissolved oxygen (DO), nitrate (NO_3), sulfate (SO_4), total aerobic heterotrophic plate count (HPC), total hydrocarbon utilizing bacteria (HUB) are summarized in Table 3. While intrinsic bioremediation is occurring, additional monitoring and sampling data will be required to evaluate its effectiveness in limiting the migration or elimination of the dissolved hydrocarbon plume.

CONCLUSIONS

- Benzene was the only constituent that exceeded the New Mexico Water Quality Control Commission standards (NMWQCC) of 0.010 mg/l, in MW-10, MW-10D, and MW-11.

- No free product (pipeline waste liquids) was observed in monitoring wells MW-9 through MW-13 during sampling activities.

- The hydrocarbon-impacted groundwater from the EOTT tank and line leak sources has not migrated off site, and remains well within the boundaries of the facility.

GPM will conduct first quarter sampling and monitoring operations in January 1996 at which time the reliability of the suspected sampling error for MW-11 will be re-evaluated. If you have any questions regarding this project call me at 915-368-1142.

Sincerely,

Scott Seeby
Environmental Analyst
Safety and Environmental Group
New Mexico Region

Attachments

cc: M. S. Nault, GPM-Linam Ranch Plant, NM
Jerry Sexton, OCD-Hobbs, NM
Gilbert J. Van Deventer, GCL-Midland,TX (w/o attachments)

ATTACHMENTS

DO NOT INCLUDE THIS PAGE INTO REPORT. IT IS PRESENTED HERE ONLY FOR REFERENCE OF ATTACHMENT CONTENTS

ATTACHMENT A

ATTACHMENT B

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS

ATTACHMENT A

TABLES

Table 1
Summary of Groundwater Elevations
Linam Ranch Plant - EOTT Tanks

Well	Date	Relative Ground Surface Elevations (feet)	Relative Top of Casing Elevation (feet)*	Depth to Groundwater Below Top of Casing (feet)	Corrected Relative Groundwater Elevation (feet)**	Phase-Separated Hydrocarbon Thickness (feet)
MW-9	05-17-95	3720.48	3722.48	50.60	3671.88	0.00
	11-14-95	3720.48	3722.48	50.02	3672.46	0.00
MW-10	05-17-95	3720.76	3722.90	50.45	3672.45	0.00
	11-14-95	3720.76	3722.90	49.85	3673.05	0.00
MW-10D	05-17-95	3720.85	3723.54	51.38	3672.16	0.00
	11-14-95	3720.85	3723.54	50.63	3672.91	0.00
MW-11	05-17-95	3722.02	3724.53	51.50	3673.03	0.00
	11-14-95	3722.02	3724.53	50.34	3674.19	0.00
MW-12	05-17-95	3720.60	3722.84	50.47	3672.37	0.00
	11-14-95	3720.60	3722.84	49.52	3673.32	0.00
MW-13	05-17-95	3721.63	3723.99	51.97	3672.02	0.00
	11-14-95	3721.63	3723.99	51.42	3672.57	0.00

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

** Correction Equation for Phase-Separated Hydrocarbons, if present: Corrected Relative Groundwater Elevation = Top of Casing Elevation - [Depth to Groundwater Below Top of Casing - (SG) (PSH Thickness)]; Specific Gravity (SG) = 0.82 for crude oil.

PSH indicates phase separated hydrocarbons (crude oil).

Groundwater gradient direction is towards the southeast with a hydraulic gradient of 0.003 feet/feet.

Table 2
Summary of Groundwater Analytical Results for Aromatic Volatile Organic Compounds
Linam Ranch Plant - EOTT Tanks

Constituent	Date	Monitoring Well Numbers						WQCC Standards (mg/l)
		MW-9 (mg/l)	MW-10 (mg/l)	MW-10D (mg/l)	MW-11 (mg/l)	MW-12 (mg/l)	MW-13 (mg/l)	
Benzene	05-17-95	<0.001	**3.225**	**0.096**	<0.001	<0.001	<0.001	0.010
	11-14-95	<0.001	**5.230**	**0.125**	**0.306**	<0.001	0.003	
Toluene	05-17-95	<0.001	0.052	0.004	<0.001	<0.001	<0.001	0.75
	11-14-95	<0.001	0.107	0.001	<0.001	<0.001	<0.001	
Ethylbenzene	05-17-95	<0.001	0.049	<0.001	<0.001	<0.001	<0.001	0.75
	11-14-95	<0.001	0.217	<0.001	<0.001	<0.001	<0.001	
Xylenes (Total)	05-17-95	<0.001	0.169	0.008	<0.001	<0.001	<0.001	0.62
	11-14-95	<0.001	0.406	0.011	0.013	<0.001	0.001	

Analyses performed by Trace Analysis, Inc. Lubbock, Texas.
Samples obtained on May 17, 1995 analyzed for BTEX using EPA Method 8240.
Samples obtained on November 14, 1995 analyzed for BTEX using EPA Method 8020.
New Mexico Water Quality Control Commission (WQCC) Standards are listed as specified in Section 3-103.
Values in **boldface** type indicate concentrations exceed WQCC groundwater standards.

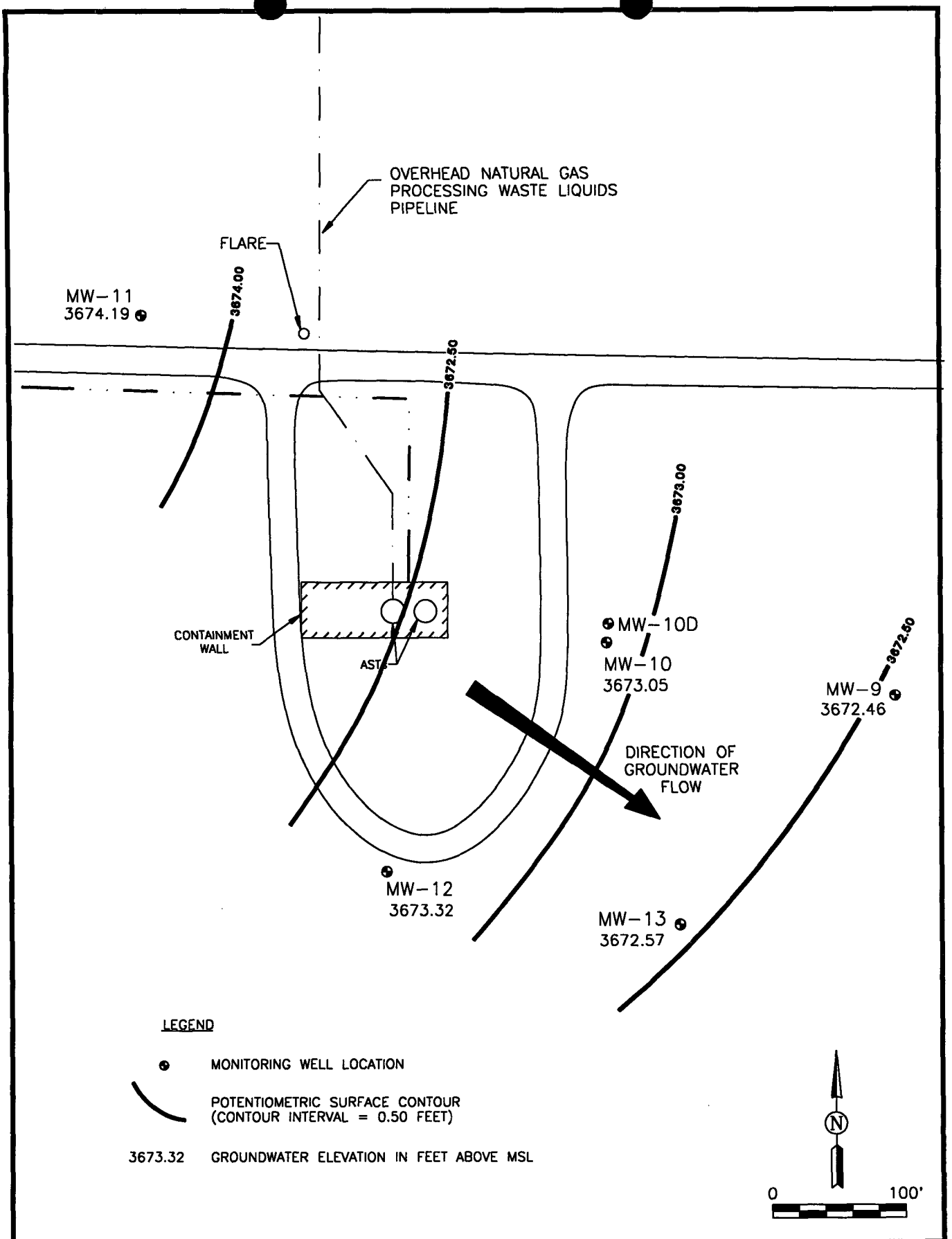
Table 3
Summary of Groundwater Analytical Results for Bacterial Activity
Linam Ranch Plant - EOTT Tanks

Constituent	Date	Monitoring Well Numbers				
		MW-9	MW-10	MW-11	MW-12	MW-13
Total Aerobic Bacteria Population (cfu/ml)	05-17-95	NA	2,700,000	930,000	640,000	NA
	11-14-95	NA	31,000	26,000	NA	17,000
Total Hydrocarbon Degraders (cfu/ml)	05-17-95	NA	78,000	480,000	450,000	NA
	11-14-95	NA	6,800	5,400	NA	550
Dissolved oxygen (mg/l)	05-17-95	1.85	1.05	1.05	0.97	1.51
	11-14-95	2.82	1.98	2.30	3.15	5.00
Nitrate-NO_3 (mg/l)	05-17-95	4.70	1.03	28.6	1.01	5.00
	11-14-95	NA	< 0.01	1.56	NA	0.02
Sulfate-SO_4 (mg/l)	05-17-95	126	184	190	206	99
	11-14-95	NA	174	184	NA	44

Analyses performed by Trace Analysis, Inc. with assistance from the Biological Sciences Department of Texas Tech University using modified standard plate count methods (Appendix D).
Total Aerobic Bacteria Population equivalent to Total Aerobic Heterotrophic Plate Count.
Total Hydrocarbon Degraders equivalent to Total Hydrocarbon Utilizing Bacteria.
Bacteria population counts reported in colony forming units per milliliter (cfu/ml).

ATTACHMENT B

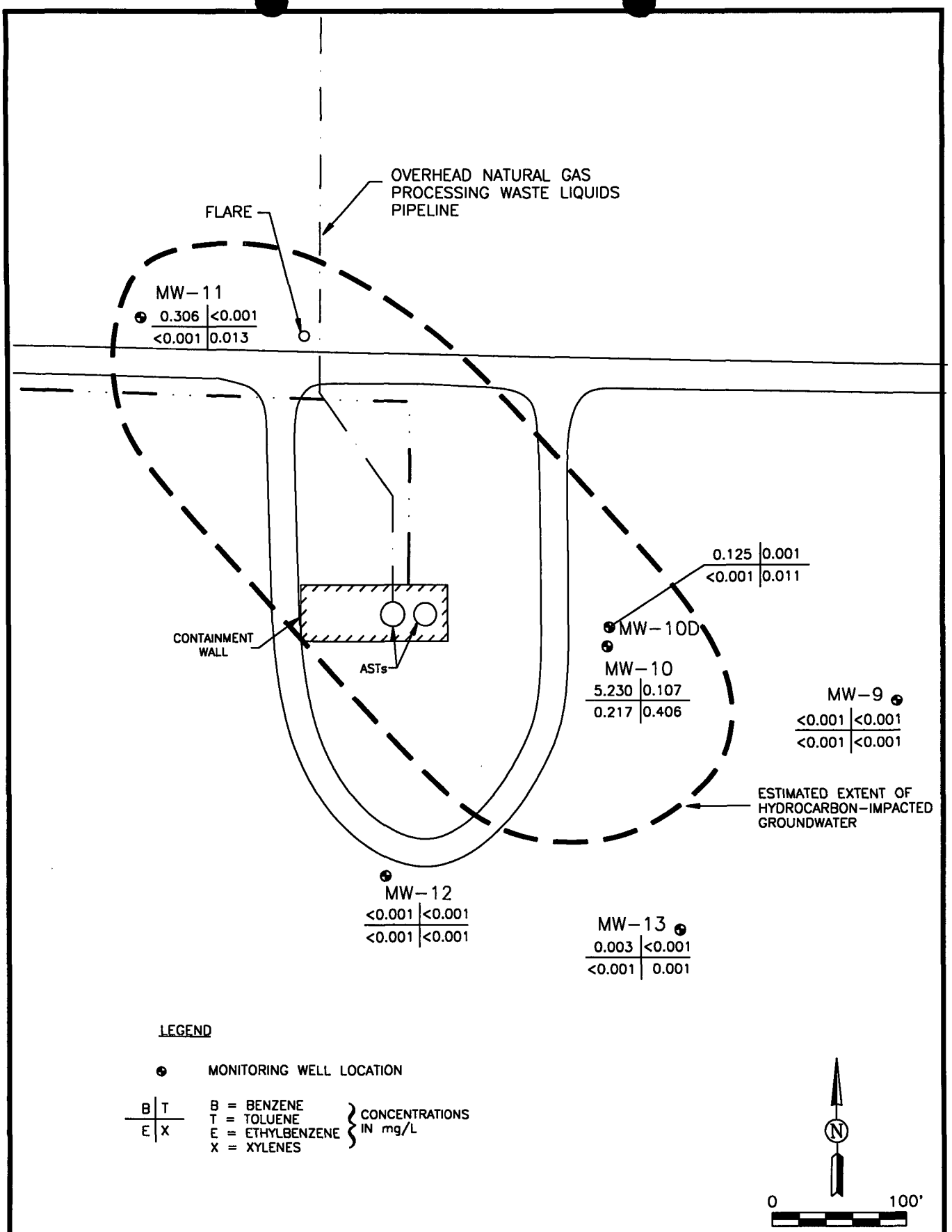
FIGURES



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 11/14/95	REV. NO.: 0
AUTHOR: GJV	DRAWN BY: MP
CK'D BY: BAL	FILE: LNMRCH01

FIGURE 1
LINAM RANCH PLANT
POTENTIOMETRIC SURFACE MAP



GCL

CLIENT: GPM GAS CORPORATION	
DATE: 11/14/95	REV. NO.: 0
AUTHOR: GJV	DRAWN BY: MP
CK'D BY: BAL	FILE: LNMRCH02

FIGURE 2
LINAM RANCH PLANT
BTEX CONCENTRATION MAP

ATTACHMENT C

LABORATORY ANALYTICAL REPORTS

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

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suit 1100
Albuquerque, NM 87102

November 20, 1995
Receiving Date: 11/15/95
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 9845

Prep Date: 11/15/95
Analysis Date: 11/15/95
Sampling Date: 11/14/95
Sample Condition: I & C
Sample Received by: ML
Project Name: Linam Ranch Plant (EOTT Tanks)

TA#	Field Code	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL-BENZENE (ug/L)	M,P,O XYLENE (ug/L)	TOTAL BTEX (ug/L)
T44159	9511141040 MW - 11	306	<1	<1	13	319
T44160	9511141210 MW - 13	3	<1	<1	1	4
T44161	9511141300 MW - 10	5,230	107	217	406	5,960
T44162	9511141315 MW - d	5,180	88	220	400	5,888
T44163	9511141400 MW - 10d	125	1	<1	11	137
T44164	9511141430 MW - 9	<1	<1	<1	<1	<1
T44165	9511141530 MW - 12	<1	<1	<1	<1	<1
QC	Quality Control	103	106	104	310	
Reporting Limit		1	1	1	1	
RPD		0	1	1	0	
% Extraction Accuracy		104	102	101	100	
% Instrument Accuracy		104	106	104	104	

METHODS: EPA SW 846-5030, 8020.
BTEX SPIKE: 100 ug/L BTEX.

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

11-20-95
Date

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

December 27, 1995
Receiving Date: 11/15/95
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 9845

Prep Date: 11/15/95
Analysis Date: 11/15-21/95
Sampling Date: 11/14/95
Sample Condition: I & C
Sample Received by: ML
Project Name: Linam Ranch Plant (EOTT Tanks)

TA#	FIELD CODE	HPC (CFU/ml)	HUB (CFU/ml)
T44159	9511141040 MW - 11	2.6 x 10E4	5.4 x 10E3
T44160	9511141210 MW - 13	1.7 x 10E4	5.5 x 10E2
T44161	9511141300 MW - 10	3.1 x 10E4	6.8 x 10E3

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

12-27-95
DATE

TRACEANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

6701 Aberdeen Avenue
Lubbock, Texas 79424
806•794•1296
FAX 806•794•1298

ANALYTICAL RESULTS FOR
GCL ENVIRONMENTAL
Attention: Annette Montoya
505 Marquette NW, Suite 1100
Albuquerque, NM 87102

December 26, 1995
Receiving Date: 11/15/95
Sample Type: Water
Charge Code No: LREOTT-20-300
Project Location: NA
COC# 9845

Prep Date: 11/21/95
Analysis Date: 11/21/95
Sampling Date: 11/14/95
Sample Condition: I & C
Sample Received by: ML
Project Name: Linam Ranch Plant (EOTT Tanks)

TA#	FIELD CODE	SULFATE (mg/L)	(NO3-NO2)-N (mg/L)
T44159	9511141040 MW - 11	184	1.56
T44160	9511141210 MW - 13	44	0.02
T44161	9511141300 MW - 10	174	<0.01
QC	Quality Control	9.6	1.02
RPD		20	4
% Extraction Accuracy		90	102
% Instrument Accuracy		96	101
REPORTING LIMIT		1.0	0.01

METHODS: EPA 375.4, 353.3.
SULFATE SPIKE AND QC: 10 mg/L SULFATE.
(NO3-NO2)-N SPIKE: 1.33 mg/L (NO3-NO2)-N.
(NO3-NO2)-N QC: 1.0 mg/L (NO3-NO2)-N.

12-26-95

Director, Dr. Blair Leftwich
Director, Dr. Bruce McDonell

DATE

TRACEANALYSIS, INC.
A Laboratory for Advanced Environmental Research and Analysis

and Engineering
A BDM International Company

(505) 842-0001
FAX: (505) 842-0595

(301) 459-9677
FAX: (301) 459-3064

(505) 524-5353
FAX: (505) 524-5315

Chain of Custody

Date 11/14/95 Page 1 Of 1

Lab Name TRACE ANALYSIS
Address 6701 ANDERSON AVENUE
EUNICE, TEXAS 79026
Telephone (806) 726-1296

Samplers (SIGNATURES)

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	TPH/BTEX Modified 8015	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)	SO4/NO3	HPC/HUB			Number of Containers
95MW10 c/o	H2O	MW-11		2																					2	1			5
95MW10	H2O	MW-15		2																					2	1			5
95MW1300	H2O	MW-10		2																					2	1			5
95MW1325	H2O	MW-10		2			duplicate of MW-10																						2
95MW1300	H2O	MW-10A		2																									2
95MW1430	H2O	MW-9		2																									2
95MW1330	H2O	MW-12		2																									2

Project Information	Sample Receipt
Project	Total No. of Containers
Project Director	Chain of Custody Seals
Charge Code No.	Rec'd Good Condition/Cold
Shipping ID. No.	Conforms to Record
Via:	Lab No.

Special Instructions/Comments:

Relinquished By 1.	Relinquished By 2.	Relinquished By 3.
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)	(Company)
Received By 1.	**Received By 2.**	**Received By (Laboratory) 3.**
(Signature) (Time)	(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)	(Laboratory)

Distribution: White, Canary-Laboratory • Pink, GCL

ENRON
Operations Company

11525 West Carlsbad Highway, Hobbs, New Mexico 88240 (505) 393-5109

12-7-94

New Mexico Oil Conservation Division
P.O. Box 2088
Santa Fe, N.M. 87504

RECEIVED
DEC 12 1994
OIL CONSERVATION DIV.
SANTA FE

Attention: Bill Olsen

Per our conversation and visit on December 6, 1994 on the analytical results of drums being stored at the Hobbs Plant and Hobbs #2, we have dumped the drums at the Hobbs Plant into our land farm, and would like permission to transport the drums from Hobbs #2 to USPCI in Wenoka, Oklahoma. Attached are the sample results of both locations for your records. These samples were tested by Analytical Technologies Inc. both in Albuquerque, N.M. and Phoenix, AZ. for the following criteria. Flash point, pH, RCRA Metals by TCLP 1311, Gas/Diesel 8015 Mod, BTEX/MTBE 8020, Chlorinated Hydrocarbons 601/8010 and Aromatic Hydrocarbons 602/8020. Since the Hobbs Facilities are scheduled to be transferred to GPM on January 1, 1995 I am at your disposal for further assistance on clearing up this matter so please feel free to contact me at (505)393-5109.

Sincerely,

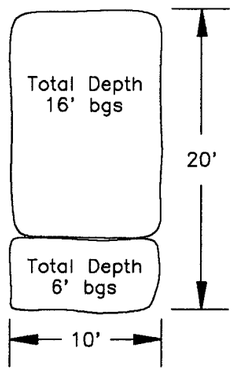
Michael Kneese

Michael Kneese
Environmental Field Technician

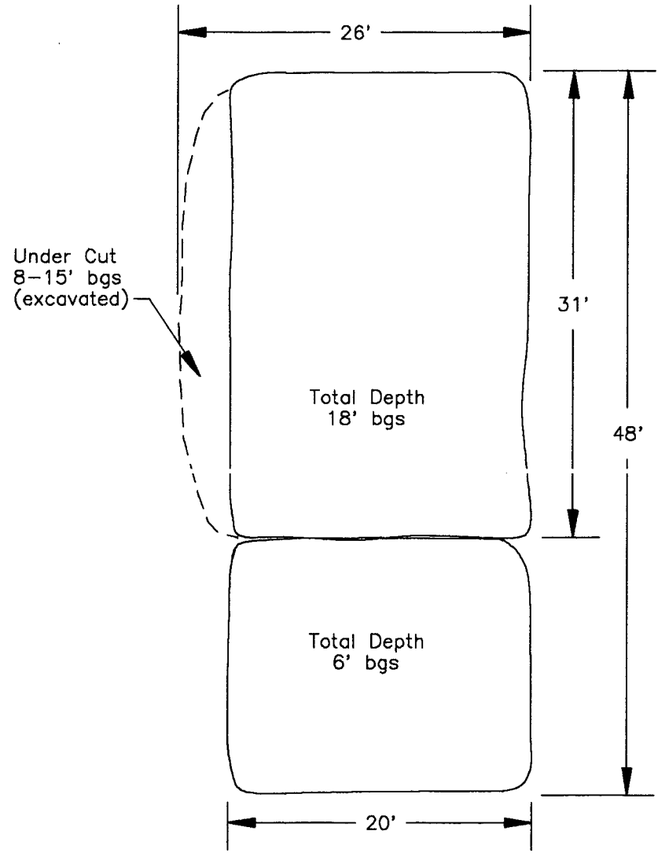
12/14/94

Verbally approved

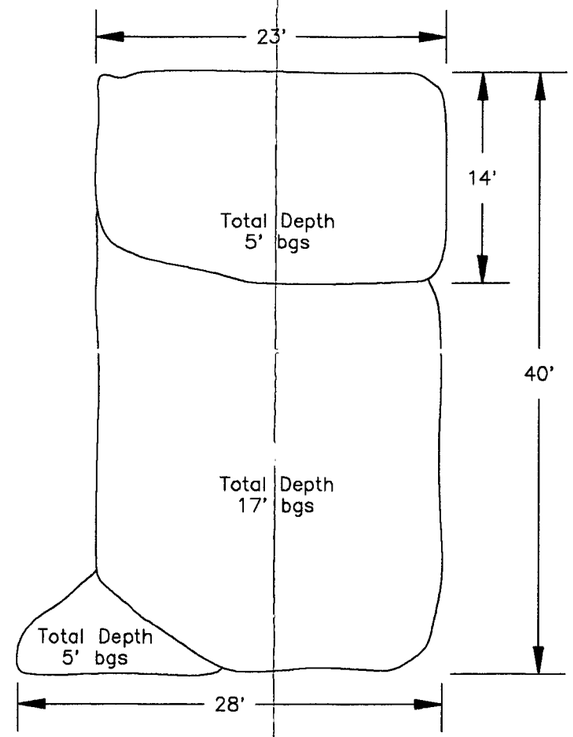
xc: Dennis Howell
Akhtar Alvi
Lou Soldano
Wayne Price
file



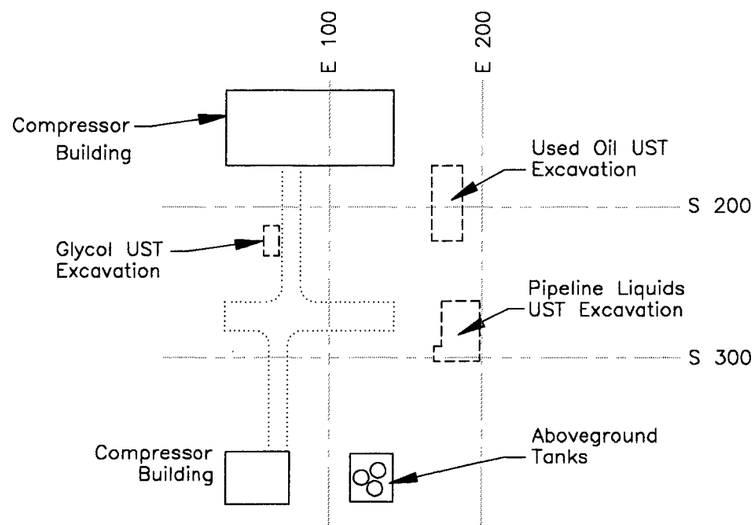
Glycol UST Excavation



Used Oil UST Excavation



Pipeline Liquids UST Excavation



Northeast corner of each UST excavation relative to facility survey grid.

Excavation	South (feet)	East (feet)
Glycol	217.27	75.46
Used Oil	179.38	192.10
Pipeline Liquids	269.00	200.36

Note: bgs = below ground surface

N

0 10 ft

D/4150/415007F.DWG

DANIEL B. STEPHENS & ASSOCIATES, INC.
10-94
JN 4150

Final Plan View Dimensions of UST Excavations
Hobbs Compressor Station No. 2

Figure 1

Analytical **Technologies,** Inc. 9830 S. 51st Street Suite B-113 Phoenix, AZ 85044 (602) 496-4400

ATI I.D. **410820**

November 8, 1994

Enron Gas Processing Co.
11525 W. Carlsbad Highway
Hobbs, NM 88240

Project Name/Number: Investigation Drums Hobbs Plant

Attention: Mike Kneese

On **10/22/94**, Analytical Technologies, Inc., received a request to analyze **aqueous** sample(s). The sample(s) were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

EPA method 601/602 analysis was performed by ATI, 2709-D Pan American Freeway, NE, Albuquerque, NM 87107.

If you have any questions or comments, please do not hesitate to contact us at (602) 496-4400.

Agustin M. Ruiz
Project Manager

Donna M. McKinney
Project Manager

AMR/paw

Enclosure

ADHS License No. AZ0061
Donald F. Weber, Laboratory Manager

Analytical Technologies, Inc.

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS

DATE RECEIVED : 10/22/94
REPORT DATE : 11/08/94

ATI I.D. : 410820

Hobbs Plant

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	DECON H20	AQUEOUS	10/21/94
02	DEVELOPING H20	AQUEOUS	10/21/94

----- TOTALS -----

MATRIX	# SAMPLES
AQUEOUS	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 410820

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS Hobbs Plant

DATE RECEIVED : 10/22/94
REPORT DATE : 11/08/94

PARAMETER	UNITS	01	02
FLASH POINT (EPA 1010)	DEG. F	>200	>200
PH (EPA 150.1)	UNITS	9.0	8.2

Analytical Technologies, Inc GENERAL CHEMISTRY - QUALITY CONTROL

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS ATI I.D. : 410820

Hobbs Plant

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
FLASH POINT	FAHREN	41082001	>200	>200	NA	NA	NA	NA
PH	UNITS	41082201	7.6	7.6	0	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 410820

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS Hobbs Plant

DATE RECEIVED : 10/22/94
REPORT DATE : 11/08/94

PARAMETER	UNITS	01	02
SILVER (TCLP 1311/6010)	MG/L	<0.05	<0.05
ARSENIC (TCLP 1311/6010)	MG/L	<0.1	<0.1
BARIUM (TCLP 1311/6010)	MG/L	<0.50	<0.50
CADMIUM (TCLP 1311/6010)	MG/L	<0.05	<0.05
CHROMIUM (TCLP 1311/6010)	MG/L	<0.10	<0.10
MERCURY (TCLP 1311/7470)	MG/L	<0.002	<0.002
LEAD (TCLP 1311/6010)	MG/L	<0.10	<0.10
SELENIUM (TCLP 1311/6010)	MG/L	<0.1	<0.1

Analytical Technologies, Inc.

METALS - QUALITY CONTROL

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS ATI I.D. : 410820

Hobbs Plant

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER (IN TCLP)	MG/L	41082001	<0.05	<0.05	NA	0.92	1.00	92
ARSENIC (IN TCLP)	MG/L	41082001	<0.1	<0.1	NA	1.0	1.0	100
BARIUM (IN TCLP)	MG/L	41082001	<0.50	<0.50	NA	4.16	4.00	104
CADMIUM (IN TCLP)	MG/L	41082001	<0.05	<0.05	NA	0.99	1.00	99
CHROMIUM (IN TCLP)	MG/L	41082001	<0.10	<0.10	NA	0.99	1.00	99
MERCURY (IN TCLP)	MG/L	41082915	<0.002	<0.002	NA	0.050	0.050	100
LEAD (IN TCLP)	MG/L	41082001	<0.10	<0.10	NA	0.98	1.00	98
SELENIUM (IN TCLP)	MG/L	41082001	<0.1	<0.1	NA	0.9	1.0	90

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 41082001

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: ENRON GAS PROCESSING CO.	DATE SAMPLED	: 10/21/94
PROJECT #	: (NONE)	DATE RECEIVED	: 10/22/94
PROJECT NAME	: INVEST.DRUMS	DATE EXTRACTED	: N/A
CLIENT I.D.	: DECON H20	DATE ANALYZED	: 10/28/94
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
	Hobbs Plant	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.5
BROMOMETHANE	<1.0
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.5
CHLOROMETHANE	<1.0
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<1.0
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.5
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.5
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<1.0
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.2
VINYL CHLORIDE	<0.5
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	2.4

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	88
TRIFLUOROTOLUENE (%)	93

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 41082002

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: ENRON GAS PROCESSING CO.	DATE SAMPLED	: 10/21/94
PROJECT #	: (NONE)	DATE RECEIVED	: 10/22/94
PROJECT NAME	: INVEST.DRUMS	DATE EXTRACTED	: N/A
CLIENT I.D.	: DEVELOPING H20	DATE ANALYZED	: 10/28/94
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
	Hobbs Plant	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.5
BROMOMETHANE	<1.0
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.5
CHLOROMETHANE	<1.0
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<1.0
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.5
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.5
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<1.0
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.2
VINYL CHLORIDE	<0.5
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	2.1

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	94
TRIFLUOROTOLUENE (%)	94

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT	: ENRON GAS PROCESSING CO.	ATI I.D.	: 410820
PROJECT #	: (NONE)	DATE EXTRACTED	: 10/28/94
PROJECT NAME	: INVEST.DRUMS	DATE ANALYZED	: 10/28/94
CLIENT I.D.	: REAGENT BLANK Hobbs Plant	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.5
BROMOMETHANE	<1.0
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.5
CHLOROMETHANE	<1.0
DIBROMOCHLOROMETHANE	<0.2
2-CHLOROETHYL VINYL ETHER	<1.0
1,3-DICHLOROBENZENE	<0.5
1,2 & 1,4-DICHLOROBENZENE	<0.5
DICHLORODIFLUOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.5
1,1-DICHLOROETHENE	<0.2
1,2-DICHLOROETHENE(TOTAL)	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
ETHYLBENZENE	<0.5
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.5
TOLUENE	<0.5
1,1,1-TRICHLOROETHANE	<1.0
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE	<0.2
TRICHLOROFLUOROMETHANE	<0.2
VINYL CHLORIDE	<0.5
TOTAL XYLENES	<0.5
TRICHLOROTRIFLUOROETHANE	<2.0

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	87
BROMOFLUOROBENZENE (%)	97

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 410820

TEST : VOLATILE HALOCARBONS/AROMATICS (EPA 601/602)

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS
REF I.D. : 41149905

DATE ANALYZED : 10/29/94
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

Hobbs Plant

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
1,1-DICHLOROETHENE	<0.2	10	9.5	95	9.7	97	2
TRICHLOROETHENE	<0.2	10	9.3	93	9.2	92	1
TETRACHLOROETHENE	NA	NA	NA	NA	NA	NA	NA
BENZENE	<0.5	10	8.7	87	8.5	85	2
BROMODICHLOROMETHANE	NA	NA	NA	NA	NA	NA	NA
CHLOROFORM	NA	NA	NA	NA	NA	NA	NA
1,1,1-TRICHLOROETHANE	NA	NA	NA	NA	NA	NA	NA
TOLUENE	<0.5	10	9.0	90	8.8	88	2
CHLOROBENZENE	<0.5	10	8.6	86	8.5	85	1
M-XYLENE	NA	NA	NA	NA	NA	NA	NA

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 41082001

TEST : FUEL HYDROCARBONS (MOD. EPA 8015)

CLIENT	: ENRON GAS PROCESSING CO.	DATE SAMPLED	: 10/21/94
PROJECT #	: (NONE)	DATE RECEIVED	: 10/22/94
PROJECT NAME	: INVEST.DRUMS	DATE EXTRACTED	: 10/25/94
CLIENT I.D.	: DECON H20	DATE ANALYZED	: 10/27/94
SAMPLE MATRIX	: AQUEOUS	UNITS	: MG/L
	Hobbs Plant	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS, C6-C10	<1
FUEL HYDROCARBONS, C10-C22(BLS-191)	<1
FUEL HYDROCARBONS, C22-C36	<1
FUEL HYDROCARBONS (CALCULATED SUM)	<1
SURROGATE PERCENT RECOVERIES	
O-TERPHENYL (%)	116

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 41082002

TEST : FUEL HYDROCARBONS (MOD. EPA 8015)

CLIENT	: ENRON GAS PROCESSING CO.	DATE SAMPLED	: 10/21/94
PROJECT #	: (NONE)	DATE RECEIVED	: 10/22/94
PROJECT NAME	: INVEST.DRUMS	DATE EXTRACTED	: 10/25/94
CLIENT I.D.	: DEVELOPING H20	DATE ANALYZED	: 10/28/94
SAMPLE MATRIX	: AQUEOUS	UNITS	: MG/L
	Hobbs Plant	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
FUEL HYDROCARBONS, C6-C10	<1
FUEL HYDROCARBONS, C10-C22(BLS-191)	<1
FUEL HYDROCARBONS, C22-C36	<1
FUEL HYDROCARBONS (CALCULATED SUM)	<1
SURROGATE PERCENT RECOVERIES	
O-TERPHENYL (%)	111

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : FUEL HYDROCARBONS (MOD. EPA 8015)

		ATI I.D.	: 410820
CLIENT	: ENRON GAS PROCESSING CO.	DATE EXTRACTED	: 10/25/94
PROJECT #	: (NONE)	DATE ANALYZED	: 10/26/94
PROJECT NAME	: INVEST.DRUMS	UNITS	: MG/L
CLIENT I.D.	: REAGENT BLANK Hobbs Plant	DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
FUEL HYDROCARBONS, C6-C10	<2
FUEL HYDROCARBONS, C10-C22(BLS-191)	<1
FUEL HYDROCARBONS, C22-C36	<1
FUEL HYDROCARBONS (CALCULATED SUM)	-

SURROGATE PERCENT RECOVERIES

O-TERPHENYL (%)	96

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 410820

TEST : FUEL HYDROCARBONS (MOD. EPA 8015)

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS
REF I.D. : 41149804

DATE ANALYZED : 10/27/94
SAMPLE MATRIX : AQUEOUS
UNITS : MG/L

Hobbs Plant

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
FUEL HYDROCARBONS (C10-C22)	<1	17	17	100	17	100	0

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 41082001

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT	: ENRON GAS PROCESSING CO.	DATE SAMPLED	: 10/21/94
PROJECT #	: (NONE)	DATE RECEIVED	: 10/22/94
PROJECT NAME	: INVEST.DRUMS	DATE EXTRACTED	: N/A
CLIENT I.D.	: DECON H20	DATE ANALYZED	: 10/25/94
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
	Hobbs Plant	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%)	104

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 41082002

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT	: ENRON GAS PROCESSING CO.	DATE SAMPLED	: 10/21/94
PROJECT #	: (NONE)	DATE RECEIVED	: 10/22/94
PROJECT NAME	: INVEST.DRUMS	DATE EXTRACTED	: N/A
CLIENT I.D.	: DEVELOPING H20	DATE ANALYZED	: 10/25/94
SAMPLE MATRIX	: AQUEOUS	UNITS	: UG/L
	Hobbs Plant	DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5
METHYL-t-BUTYL ETHER	<2.5
SURROGATE PERCENT RECOVERIES	
BROMOFLUOROBENZENE (%)	100

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT	: ENRON GAS PROCESSING CO.	ATI I.D.	: 410820
PROJECT #	: (NONE)	DATE EXTRACTED	: 10/25/94
PROJECT NAME	: INVEST.DRUMS	DATE ANALYZED	: 10/25/94
CLIENT I.D.	: REAGENT BLANK Hobbs Plant	UNITS	: UG/L
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BENZENE	<0.5
TOLUENE	<0.5
ETHYLBENZENE	<0.5
TOTAL XYLENES	<0.5
METHYL-t-BUTYL ETHER	<2.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE (%)	103

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 410820

TEST : BTEX + MTBE (EPA METHOD 8020)

CLIENT : ENRON GAS PROCESSING CO.
PROJECT # : (NONE)
PROJECT NAME : INVEST.DRUMS
REF I.D. : 41049907

DATE ANALYZED : 10/25/94
SAMPLE MATRIX :
UNITS : UG/L

Hobbs Plant

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
BENZENE	<0.5	10	11	110	11	110	0
TOLUENE	<0.5	10	10	100	11	110	10
ETHYLBENZENE	<0.5	10	11	110	11	110	0
TOTAL XYLENES	<0.5	30	35	117	34	113	3
METHYL-t-BUTYL ETHER	<2.5	20	20	100	19	95	5

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

ENRON
OPERATIONS CORP.

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

October 31, 1994

RECEIVED
NOV 1 1994
OIL CONSERVATION DIV.
SANTA FE

Mr. Roger Anderson
Oil Conservation Division
2040 S. Pacheco Street
Santa Fe, NM 87505

RE: Environmental Remediation
Enron Natural Gas Processing Plant
Hobbs, New Mexico

Dear Mr. Anderson:

Thanks to Bill Olson, Chris Eustice, Dave Davis and you for meeting with Mike Kneese, Jay Snyder (Daniel B. Stephens & Associates, Inc.), and me on October 7, 1994. The objectives of the meeting were to discuss:

1. Why Enron was not able to submit the modified remedial design to the OCD by mid-September, 1994, per Enron's letter of August 17, 1994.

2. The impact of OCD regulations on Enron, regarding GPM's request to Enron that Enron either not submit the remediation design to the OCD or not follow the submission by applying to the New Mexico Air Pollution Control Bureau for an air permit. GPM wants to have the option of negotiating remediation with the OCD and submit GPM's design.

3. The anticipated date of FERC approval of sale between Enron and GPM, and how it was impacting Enron's remediation plan.

The reason Enron was not able to submit the modified remedial design by mid-September, 1994, was that the sale between Enron and GPM was anticipated to be closed on October 1, 1994, *(i.e., two months earlier than the previously anticipated date of December 1, 1994.)* Accordingly, GPM had requested that Enron not submit the design so that GPM would have the option to negotiate remediation with the OCD and submit GPM's design.

The sale did not go through on October 1, 1994. FERC approval is expected during November, 1994, and the sale is anticipated to be closed during December, 1994. Accordingly, Enron requested a meeting with the OCD to discuss the impact of OCD regulations on Enron in light of the delay in the sale and GPM's request that Enron either not submit the design or not follow the submission with an air permit application.

You advised us that *"no action"* was not an option because the contamination at the site had a history of a few years and the OCD would like that action be taken to initiate remediation. You also advised that by November 1, 1994, either Enron and GPM should write a joint letter to commit to a reasonable date to initiate action for remediation after close of the sale or Enron should submit the remediation design to the OCD for review. You stated that the submission of design to the OCD would not mean that Enron could not negotiate changes to the design or that GPM could not negotiate or submit their own design.

Currently, Enron owns the plant and after the sale, GPM will own the plant . To keep remediation responsibility with the respective owner, Enron has decided not to request GPM to submit a joint letter to the OCD, but to submit Enron's design for OCD review. Enclosed are: drafts of the Remedial Design Report, Construction Specifications, and Drawings.

We appreciate your understanding that because of the sale situation, we are not able to make the progress you and we would have liked to make on this remediation project.

Should you have questions, please call me at (713) 646-7337.

Sincerely,

Akhtar A. Alvi, P.E.
Senior Project Engineer
Environmental Affairs Department

AAA/klw

Enclosure

cc (with enclosure): Vince Bernard, GPM, Odessa

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

October 7, 1994

CERTIFIED MAIL
RETURN RECEIPT NO. P-667-242-171

Mr. Akhtar A. Alvi
Environmental Affairs Department
ENRON Operations Corp.
P.O. Box 1188
Houston, Texas 77251-1188

RE: SOIL AND GROUND WATER INVESTIGATIONS
HOBBS GAS PLANT AND HOBBS COMPRESSOR STATION #2
LEA COUNTY, NEW MEXICO

Dear Mr. Alvi:

The New Mexico Oil Conservation Division has completed a review of ENRON's August 17, 1994 correspondence and August 10, 1994 "SUBSURFACE INVESTIGATION AT HOBBS COMPRESSOR STATION NO. 2 AND HOBBS NATURAL GAS PROCESSING PLANT". This report contains the results of soil and ground water investigation activities at the ENRON's Hobbs Gas Processing Plant and Hobbs Compressor Station #2.

The investigation activities conducted to date are satisfactory. However, based upon a review of this document the OCD requires that ENRON submit the following information to the OCD by January 31, 1995:

1. The report references previous work performed by Geoscience Consultants Limited (GCL) in February of 1994. Please provide the OCD with GCL's report on the investigation.

2. Please provide the proposed disposal/remediation method for the stockpiled soils at the Hobbs Compressor Station No. 2.

3. Please provide the proposed disposal method for the purged ground water which was generated during the investigations.

4. Please provide the final dimensions of the excavations at the Hobbs Compressor Station No. 2.

5. Please provide a work plan to completely define the extent of ground water contamination related to ENRON's activities at the Hobbs Compressor Station No. 2.

6. Please provide a work plan for installation of permanent monitoring wells around the EOTT tanks at the Hobbs Gas Processing Plant.

Please submit all original documents to the OCD Santa Fe Office and copy the OCD Hobbs Office on all submittals.

If you have any questions in this matter, please feel free to contact me at (505) 827-5885.

Sincerely,

William C. Olson
Hydrogeologist
Environmental Bureau

xc: Jerry Sexton, OCD Hobbs District Supervisor
Wayne Price, OCD Hobbs Office

10/7/94 OCD/ENRON Meeting on Hobbs Gas Plant

attendees
- Bill Olson - OCD Envir. Bureau
- Roger Anderson - OCD E Bureau
- Chris Eustice - OCD "
- Dave Davis - OCD "
- Mike Kneese - ENRON
- Akhtar Alvi - ENRON
- Jay Snyder - DBS+A

ENRON requesting delay in submission of remedial design (at request of GPM)

Supplemental Envir Investigation - Feb. 1994
DBS+A

ENRON will send ltr to OCD with date for submission of remedial design. Letter will be ~~sent~~ sent by Nov. 1, 1994

ENRON
OPERATIONS CORP.

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

August 17, 1994

Mr. Roger Anderson
Oil Conservation Division
P. O. Box 2088
Santa Fe, NM 87504-2088

RE: Environmental Investigation & Remediation
Northern Natural Gas Company
Hobbs Gas Plant and Hobbs Compressor Station No. 2
New Mexico

Dear Mr. Anderson:

Thanks to Bill Olson, Chris Eustice and you for meeting with Mike Kneese, Jeff Atwood, Dave Baker (Team Environmental Services, Inc.), and me on August 11, 1994. The objectives of the meeting were:

1. To review the progress of remediation design for the Hobbs Gas Plant project, and;

2. To submit to OCD the report of subsurface investigation at Hobbs Compressor Station No. 2 and EOTT tanks at Hobbs Gas Processing Plant.

As we discussed, Enron's remediation consultant, Daniel B. Stephens & Associates, Inc. (DBS&A), completed the original remediation design based on an air emission rate of less than 10 lb/hr. The objective of the design was to avoid the air permitting process so that we could proceed with remediation early. However, because of the low rate of emission, the design was inefficient and required more capital, operation and maintenance costs than would have been required by an efficient design. Accordingly, we have requested DBS&A to modify the design by increasing the air emission rate, which may require an air permit. Our plan is to submit the modified design to the OCD around mid-September, 1994.

At Hobbs Compressor Station No. 2, the area of actionable contamination may extend beyond the eastern property boundary. Enron's Legal Department has been requested to obtain approval from the property owner to extend the subsurface investigation onto his/her area.

As you know, GPM and Enron have entered into a purchase agreement for the plant and eight compressor stations with an anticipated closing to occur on December 1, 1994. However, depending upon the FERC approval of the sale, there is a possibility that the closing may occur on October 1, 1994. What this means is that after the closing, GPM will be working with the OCD to comply with the regulatory requirements.

We would appreciate your review of the Subsurface Investigation Report which we submitted to you in the meeting on August 11, 1994.

Should you have questions, please call me at (713) 646-7337.

Sincerely,

Akhtar A. Alvi, P.E.
Senior project Engineer
Environmental Affairs Department

AAA/klw

cc (with enclosure/Subsurface Investigation Report): Jeff Atwood
Mike Kneese
Vince Bernard, GPM, Odessa

cc (without enclosure): Darrell Kinder
Gary Kratville
Mike Terraso
Bill Kendrick
Frank Smith
Bob Marley, DBS&A
Jay Snyder, DBS&A

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☐ Telephone ☑ Personal | Time 1300 hrs | Date 8/11/94

Originating Party	Other Parties
Mike Kneese, Akhtar Alvi, Jeff ENRON	Bill Olson, Roger Anderson Envir. Bureau

Subject

ENRON Hobbs Gas Plant + Hobbs #2 Compressor Investigations

Discussion

ENRON presented DBS & Assoc August 10, 1994 "Subsurface Investigation At Hobbs Compression Station No. 2 and Hobbs Natural Gas Processing Plant"
Reviewed document

Conclusions or Agreements

OCD will provide comment ltr. to ENRON within 30 days

Distribution

Signed Bill Olson

ENRON
OPERATIONS CORP.

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

April 18, 1994

Mr. Roger Anderson
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504

Subject: Environmental Investigations & Remediation
Northern Natural Gas Company
Hobbs Gas Plant & Compressor Station #2, New Mexico

Dear Mr. Anderson:

Thanks to Bill Olson, Bobby Myers and you for meeting with Mike Kneese, Jay Snyder (of Daniel B. Stephens & Associates, Inc.), and me on March 29, 1994. The objectives of the meeting were to discuss:

1. The report of Supplemental Environmental Investigation for soil and groundwater contamination around the API separator at Hobbs Gas Plant.

2. The potential remediation technologies for the Hobbs Gas Plant project.

Based on our discussions, the following is a list of the follow-up action items:

1. You have asked us to sample the monitoring wells, MW-1 to MW-8, one time for petroleum aromatic hydrocarbons (PAHs) by EPA Method 8100, metals, and inorganics to comply with the New Mexico Water Quality Control Commission Regulations. Having checked the data we already have, we have prepared the enclosed Table 1 for the required additional testing.

2. We would initiate insitu bioremediation by bioventing (air injection and vapor extraction) for soil contamination and air sparging below the water table for ground water contamination.

3. We would request a review meeting with you when we have designed the bioremediation system. We expect this to happen in the next 6-8 weeks.

4. We are working on doing additional environmental investigations near the EOTT tanks at Hobbs Gas Plant and near the tank excavations at Hobbs Compressor Station #2. Upon completion of these investigations, we would submit the report to you and request a review meeting for the follow-up action.

As you know, GPM and Enron have entered into a purchase agreement for the plant and eight compressor stations with an anticipated closing to occur on December 1, 1994. What it means is that after the closing, GPM will be maintaining and operating the remediation systems to comply with the OCD regulatory requirements.

Should you have questions, please call me at (713) 646-7337.

Sincerely,

Akhtar A. Alvi, P.E.
Senior Project Engineer
Environmental Affairs Dept.

Enclosure

cc: Leonard Hilton - w/o enclosure
Darrell Kinder - "
Gary Kratville - "
Ben Bowman - "
Mike Terraso - "
Bill Kendrick - "
Frank Smith - "
Jeff Atwood - w/enclosure
Mike Kneese - "
Vince Bernard -GPM, Odessa - w/enclosure
Bob Marley - (DBS&A) - w/o enclosure
Jay Snyder - (DBS&A) - "

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Table 1. Summary of Required Analyses
Former Liquid Waste Disposal Pit and Oil/Water Separator
Enron Hobbs Natural Gas Processing Plant

Monitor Well	Organic Analyses	Metals Analyses	Inorganic Analyses
MW-1	PAH (8100)	Arsenic, mercury, selenium, silver	Chloride, sulfate, nitrate, TDS
MW-2	PAH (8100)	Arsenic, mercury, selenium, silver, copper	Chloride, sulfate, nitrate, TDS
MW-3	PAH (8100)	Arsenic, mercury, selenium, silver	Chloride, sulfate, nitrate, TDS
MW-4	PAH (8100)	Copper, iron, manganese, zinc	None
MW-5	Purgeable halocarbons (8010) PAH (8100)	Arsenic, barium, cadmium, chromium, lead, mercury, selenium, copper, iron, manganese, silver, zinc	Chloride, sulfate, nitrate, TDS
MW-6	PAH (8100)	Arsenic, barium, cadmium, chromium, lead, mercury, selenium, copper, iron, manganese, silver, zinc	Chloride, sulfate, nitrate, TDS
MW-7	Purgeable halocarbons (8010) PAH (8100)	Copper, iron, manganese, zinc	None
MW-8	PAH (8100)	Arsenic, barium, mercury, selenium, copper, iron, manganese, silver, zinc	Chloride, sulfate, nitrate, TDS

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

POST OFFICE BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504
(505) 827-5800

April 15, 1994

CERTIFIED MAIL
RETURN RECEIPT NO. P-176-012-074

RE: Approval to Dispose of Environmental Investigation Drill Cuttings
GW-015 - Hobbs Natural Gas Plant
Lea County, New Mexico

Dear Mr. Kneese,

The New Mexico Oil Conservation Division (OCD) has received your April 6, 1994 request to dispose of forty-three drums of drill cuttings collected during the environmental investigation at your Hobbs Gas Plant by placing them into the land farm for bioremediation.

Based on the information supplied in your proposal, the disposal of the drill cuttings **is approved.** Please call me at (505)827-4080 if you have any questions.

Sincerely,

Robert L. Myers II
Petroleum Engineer Specialist

xc: OCD Hobbs Office

ENRON
Gas Processing Company
11525 West Carlsbad Highway, Hobbs, New Mexico 88240

April 6, 1994

Mr. Roger Anderson
Oil Conservation Division
P.O. Box 2088
Santa Fe, New Mexico 87504

Dear Mr. Anderson:

We are requesting permission to dispose of forty-three drums of drill cuttings collected during environmental investigation at the Hobbs Plant. We would like to dispose of the contents of the drums by placing them into the land farm for bioremediation.

The information contained herein represents the analytical results of the soil contained in drums at the facility. Total petroleum hydrocarbon ranges from non-detect to 7,500 mg/kg. Benzene ranges from non-detect to 9.4 mg/kg. Toluene ranges from non-detect to 60 mg/kg. Ethyl benzene ranges from non-detect to 160 mg/kg. Total Xylenes range from non-detect to 170 mg/kg. We will address the monitor well purge water disposal in a future letter. If you require any additional information, please contact me at 393-5109 ext.25.

Sincerely,

Michael Kneese

Michael Kneese
Environmental Field Technician

xc: Akhtar A. Alvi
Bill Kendrick
Terry Holland
Lou Soldano
Jeff Atwood
file

ENRON
OPERATIONS CORP.

P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

March 2, 1994

RECEIVED
MAR 09 1994
OIL CONSERVATION DIV.
SANTA FE

Mr. Roger Anderson
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504

Subject: Environmental Investigation
Enron Gas Processing, Hobbs Plant, New Mexico

Dear Mr. Anderson:

This is a follow-up to our note of February 16, 1994, in which we requested you to allow Enron two weeks to submit the report and request a meeting with you.

The report of Supplemental Environmental investigation by Daniel B. Stephens and Associates, Inc. (DBS&A) is enclosed for your review. At your convenience, we are requesting a meeting with you during the last two weeks of March 1994, to discuss the report and follow-up action. One or two representatives from Enron and a representative from DBS&A will meet with you.

Should you have questions, please call me at (713) 646-7337.

Sincerely,

Akhtar A. Alvi, P.E.
Senior Project Engineer

Enclosure

cc: Leonard Hilton - w/o enclosure
Gary Kratville - "
Ben Bowman - "
Mike Terraso - "
Bill Kendrick - "
Jeff Atwood - "
Frank Smith - "
Mike Kneese - w/enclosure
Bob Marley - (DBS&A) - w/o enclosure

ENRON
OPERATIONS CORP.
P. O. Box 1188 Houston, Texas 77251-1188 (713) 853-6161

February 16, 1994

Mr. Roger Anderson
Oil Conservation Division
P. O. Box 2088
Santa Fe, New Mexico 87504

Subject: Environmental Investigation
Enron Gas Processing, Hobbs Plant, New Mexico

Dear Mr. Anderson:

This is a follow-up to Mike Kneese's submittal of Metric Corporation & IT Corporation reports to you on February 4, 1994 regarding the above subject. Daniel B. Stephens & Associates are involved in a supplemental environmental investigation to delineate the plume of contamination. Our plan is to submit the report of the supplemental investigation to you and request a meeting to discuss the report and the follow-up work.

As you may already know, currently, Enron and an interested buyer are negotiating about the sale of the plant. Because of these on-going negotiations, we would appreciate your understanding for allowing Enron two weeks to submit the report and request a meeting with you.

Should you have questions, please call me at (713) 646-7337.

Sincerely,

Akhtar A. Alvi, P.E.
Senior Project Engineer

cc: Leonard Hilton
Gary Kratville
Ben Bowman
Mike Terraso
Bill Kendrick
Jeff Atwood
Mike Kneese
Frank Smith

State of New Mexico
ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT
Santa Fe, New Mexico 87505

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

MEMORANDUM OF MEETING OR CONVERSATION

☐ Telephone ☒ Personal	Time 11:00 am	Date 2/4/94

Originating Party	Other Parties
Mike Kneese - ENRON	Bill Olson, Roger Anderson } Envir. Bureau

Subject

Ground Water Investigation - Hobbs Gas Plant

Discussion

Delivered IT & Metric reports on GW contamination
Discussed investigation work
DBS & Assoc. report not yet complete

OCD does not have time to review 2/2/94 MWL work plans for approx. 2 weeks. ENRON can proceed at own risk without approval and submit final report to OCD for approval
ENRON scheduled to drill this weekend

Conclusions or Agreements

ENRON will submit final reports when complete

Distribution

Signed Bill Olson