AP - 001

ANNUAL MONITORING REPORT

YEAR(S):

2001

2001 ANNUAL GROUNDWATER MONITORING REPORT
FORMER BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
TERRACON PROJECT NO.: 68997611
January 29, 2002

Prepared for:

HUNTSMAN POLYMERS CORPORATION
Houston, Texas

Prepared by:

TERRACON
Las Cruces, New Mexico

January 29, 2002

Mr. Lon Tullos
Huntsman Polymers Corporation
3040 Post Oak Boulevard
Houston, TX 77056

Re: 2001 Annual Groundwater Monitoring Report
Former Brickland Refinery Site
Sunland Park, New Mexico
Terracon Project No.: 68997611

Dear Mr. Tullos:

Terracon has completed the two 2001 semi-annual monitoring events for the above-referenced site. The two monitoring events were completed in general compliance with the services outlined in Terracon's Task Order No. 2 (Terracon Proposal No.: P6699-033E) dated April 27, 1999, authorized by Mr. Roger Martin on April 30, 1999.

This 2001 Annual Groundwater Monitoring Report is based on results of field activities conducted by Terracon in July 2001 and December 2001, and contains monitoring methods, observations, conclusions and recommendations made relative to the site. Please read the report carefully for details.

We appreciate the opportunity to be of service to you on this project and look forward to working with you in the future. If there are questions concerning the report or if we may be of further assistance, please call.

Sincerely,
TERRACON

Fredrick V. Small, C.S.
Senior Scientist

Mary E. Wells, P.E.
Manager, Las Cruces Office

TABLE OF CONTENTS

TABLE OF CONTENTS (Cont.)

TABLES **Page No.**

APPENDICES

2001 ANNUAL GROUNDWATER MONITORING REPORT
FORMER BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
TERRACON PROJECT NO.: 68997611
January 29, 2002

1.0 EXECUTIVE SUMMARY

This 2001 Annual Groundwater Monitoring Report documents the results of two semi-annual groundwater monitoring operations conducted by Terracon at the former Brickland Refinery site in Sunland Park, New Mexico. The semi-annual groundwater monitoring operations were conducted in July 2001 and December 2001. The report also contains summaries of the historical groundwater elevations and analytical data since 1993. In addition, the report includes a summary of the free product recovery system. This monitoring and sampling program was conducted in accordance with the Groundwater Monitoring Plan included in Section 3.5 of the Stage 2 Abatement Plan as approved by Mr. Bill Olson of the New Mexico Oil Conservation Division (NMOCD) in his letter dated December 17, 1998.

This annual report includes the following elements required by the approved Groundwater Monitoring Plan and Stage 2 Abatement Plan.

- A description of the monitoring activities that occurred during the year, with corresponding conclusions and recommendations.
- Summary tables of the past and present laboratory analytical results of groundwater and surface water sampling.
- Plots of concentrations versus time for contaminants of concern for monitoring points MW-3S, MW-3D, MW-4, MW-6S, MW-6D, MW-7, MW-9S, MW-14 and MW-15.
- Copies of laboratory analytical reports for the sampling activities conducted at the site during the past year.
- Plots of water table elevation versus time for the groundwater monitoring wells.
- Groundwater surface contour maps for the two 2001 semi-annual monitoring events based on groundwater elevations obtained from the monitoring wells.
- Total benzene, toluene, ethylbenzene and xylene (BTEX) concentration maps for the two 2001 semi-annual monitoring events.
- Free-phase hydrocarbon thickness maps for the two 2001 semi-annual monitoring events.

The semi-annual monitoring includes the following items as required by the Groundwater Monitoring Plan and Stage 2 Abatement Plan as approved by the NMOCD.

- Depth to groundwater measurements for the ten on-site monitoring wells and eight off-site monitoring wells. Water level measurements are not reported for the fourteen well points since the well points are designed only for the purpose of detecting the presence of free-phase product at the measured depths.

- Free-phase product thickness measurements in the eighteen monitoring wells and fourteen well points, and a summary of the free-phase recovery system performance.

- Laboratory analytical testing results of groundwater samples collected from nine (9) monitoring wells in July and December (MW-3S, MW-3D, MW-4, MW-6S, MW-6D, MW-7, MW-9S, MW-14, and MW-15). Tests for the July monitoring event included BTEX, PAH, and twenty priority pollutant metals. BTEX was the only test conducted for the December monitoring event.

- Laboratory analytical test results for two water samples collected from the Rio Grande during each semi-annual sampling event. One sample is collected from the upstream end of the site above MW-1 and one sample is collected from the downstream end of the site below MW-9S.

Conclusions relevant to groundwater conditions and the remediation performance at the old Brickland Refinery are presented below.

- Results of the July sampling event indicate that benzene concentrations exceeded New Mexico Water Quality Control Commission (NMWQCC) standards in three monitoring wells; MW-4 (196 g/L), MW-6S (12 g/L), and MW-9S (35 g/L). Benzene concentrations in the remaining six wells were either below laboratory detection levels or NMWQCC standards. Toluene and ethylbenzene were also detected in samples from three wells and the river, but the concentrations were significantly below NMWQCC Standards (see Table 3).

- Results of the December sampling event indicate that benzene concentrations in MW-4 (54.6 g/L) exceeded NMWQCC standards. Benzene was also detected in three other wells, but was well below NMWQCC standards. Toluene was detected in wells MW-4 and MW-9S in trace amounts; 1.8 g/L and 2 g/L, respectively. No other parameter was detected in the samples. These concentrations were consistent with results from previous years (see Table 3).

- PAH levels were below laboratory detection limits in the original samples for all monitoring wells sampled (see Table 4) during the July sampling event.

However, the duplicate sample collected from MW-14 was broken on its way to the laboratory and had to be re-collected. The replacement sample showed a naphthalene concentration of 0.034mg/L, which is believed to be the result of laboratory contamination. Other than that replacement sample for duplicate MW-14, the results of this semi-annual monitoring event appear to be consistent with previous years' results.

- Seven metals as specified in the NMWQCC regulations and the Stage 2 Abatement Plan (aluminum, barium, boron, cobalt, iron, manganese, and molybdenum) were added to the list of priority pollutant metals for the July sampling event. This addition was in agreement with the recommendations made in last year's annual report, and increased the list to a total of twenty priority pollutant metals. The results for the analyses of the priority pollutant metals for the July 2001 monitoring event indicate that levels of five of the seven metals added to the list exceeded the NMWQCC levels. Iron and manganese levels exceeded NMWQCC standards in all groundwater and surface water samples collected from the wells and river, respectively. Aluminum, boron, and chromium levels exceeded NMWQCC standards in monitoring well MW-9S; and boron levels exceeded NMWQCC standards in monitoring wells MW-6S, MW-6D, MW-14, and MW-15. Minor concentrations of the other listed metals were detected but were below NMWQCC standards. None of the original thirteen metals has exceeded the NMWQCC standards since 1996 (see Table 5).

- Free-phase product was not detected in any well during the July 2001 or December 2001 monitoring event. However, one well point (WP-26S) had a free-phase product thickness of 1.91 feet in July 2001. Product thickness was measurable in two well points, WP-26S (1.45 feet) and WP-27D (0.44 foot), during the December 2001 monitoring event. Free-phase product levels in these two well points are consistent with prior years' results at similar sampling times (see Table 6). This is the first year that recovery well MW-10 has not contained any measurable accumulation of free-phase product during both sampling events.

- Since the installation of the Xitech product recovery system in December 1998, a total of approximately 90 gallons of free-phase product and water have been removed from recovery well MW-10.

2.0 SAMPLE COLLECTION PROCEDURES

- The ten on-site monitoring wells and eight off-site monitoring wells were checked for the presence of free-phase product using a KECK oil/water

interface meter. If any detectable free-phase product was found in any of the wells, the thickness would be measured and no sample would be collected from that well for that semi-annual monitoring.

- If no detectable free-phase product was present in the well then the static water surface elevation in each well was measured and recorded. The static water surface elevations for the two monitoring periods are shown in Table 2.

- Nine monitoring wells (MW-3S, MW-3D, MW-4, MW-6S, MW-6D, MW-7, MW-9S, MW-14, and MW-15) were sampled to monitor the potential exposure pathway for contaminants of concern to reach the Rio Grande River.

- Attempts were made to purge each of the nine wells sampled by removing three (3) well casing volumes of water from each well, using a submersible mini-purger pump with silicon tubing. During purging, the water quality characteristics of temperature, pH and specific conductivity were measured using a Hydac Model 910 pH/temperature/conductivity meter to confirm that these three characteristics had stabilized before the samples were collected. The mini-purger pump was decontaminated between wells by pumping an Alconox-water mixture through the system, then rinsing/pumping clean water through the system twice. The Groundwater Sampling Data Sheets are provided in the Appendix.

- MW-3S and MW-6S were purged dry in the July 2001 monitoring event. MW-6S was again purged dry in the December 2001 event. Of the estimated three well casing volumes of twenty gallons total, only eleven gallons were able to be purged from MW-3S. Of the estimated nineteen gallons that was to be purged from MW-6S, only eight gallons and eleven gallons could be purged during the July and December 2001 monitoring events, respectively.

- A total of 305 gallons and 291 gallons of water were purged from the sampled monitoring wells during the July 2001 and December 2001 monitoring events, respectively. The purged water was disposed of by Rhino Environmental Services of El Paso, Texas, a licensed waste disposal contractor. A disposal manifest is enclosed in the Appendix.

- Groundwater samples were collected from each well after purging. Duplicate samples of MW-14 were collected during both semi-annual monitoring events. One set of samples was collected in air-tight, septum-sealed, 40-ml glass VOA sample vials with zero head space and preserved with hydrochloric acid (HCl) and refrigeration. These samples were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8021. The results of laboratory analyses for BTEX since monitoring began in 1993 are provided in

Table 3. The corresponding graphical plots of BTEX concentrations for all nine monitoring wells are provided in Figures 3a and 3i.

- During the July 2001 sampling event, a second set of water samples was collected from each sampled well in one-liter amber-colored bottles for analysis for polynuclear aromatic hydrocarbons (PAH) using EPA Method 8270C/625. A third set of water samples was collected in 500 ml bottles containing nitric acid (HNO_3) as preservative for analysis for priority pollutant metals using appropriate EPA Methods.

- The water samples were placed in an ice-filled cooler immediately after collection and delivered to Trace Analysis, Inc. in El Paso, Texas for laboratory analysis. Chain-of-custody (COC) forms, documenting: sample identification numbers; the required analysis for each sample; collection times; and delivery times to the laboratories, were completed for each set of samples. A summary of the purging, purged volume from each well, and sampling methods is provided in Table 1 below. The laboratory results of the analyses of the water samples are provided in the Appendix.

Table 1
Well Sampling and Purging Methods

Well No.	2001 Sample Date	Purge Method	Sampling Method	Purge Volume	Laboratory Analytes
MW-3S	7/26/01	Pump	Dedicated bailer	11 gallons*	BTEX, PAH, and Metals
	12/14/01	Pump	Dedicated bailer	20 gallons	BTEX only
MW-3D	7/26/01	Pump	Dedicated bailer	65 gallons	BTEX, PAH, and Metals
	12/14/01	Pump	Dedicated bailer	61 gallons	BTEX only
MW-4	7/24/01	Pump	Dedicated bailer	30 gallons	BTEX, PAH, and Metals
	12/13/01	Pump	Dedicated bailer	25 gallons	BTEX only
MW-6S	7/26/01	Pump	Dedicated bailer	8 gallons*	BTEX, PAH, and Metals
	12/14/01	Pump	Dedicated bailer	11 gallons*	BTEX only
MW-6D	7/26/01	Pump	Dedicated bailer	64 gallons	BTEX, PAH, and Metals
	12/14/01	Pump	Dedicated bailer	60 gallons	BTEX only
MW-7	7/24/01	Pump	Dedicated bailer	25 gallons	BTEX, PAH, and Metals
	12/13/01	Pump	Dedicated bailer	20 gallons	BTEX only
MW-9S	7/26/01	Pump	Dedicated bailer	21 gallons	BTEX, PAH, and Metals
	12/14/01	Pump	Dedicated bailer	17 gallons	BTEX only
MW-14	7/24/01	Pump	Dedicated bailer	43 gallons	BTEX, PAH, and Metals
	12/13/01	Pump	Dedicated bailer	38 gallons	BTEX only

Table 1
Well Sampling and Purging Methods

Well No.	2001 Sample Date	Purge Method	Sampling Method	Purge Volume	Laboratory Analytes
MW-15	7/25/01	Pump	Dedicated bailer	38 gallons	BTEX, PAH, and Metals
	12/13/01	Pump	Dedicated bailer	39 gallons	BTEX only
River Upstream	8/1/01	NA	Teflon Dipper	NA	BTEX, PAH, and Metals
	12/14/01	NA	Teflon Dipper	NA	BTEX only
River Downstream	8/1/01	NA	Teflon Dipper	NA	BTEX, PAH, and Metals
	12/14/01	NA	Teflon Dipper	NA	BTEX only
Total volume purged during semi-annual monitoring event in July 2001:					305 gallons
Total volume purged during annual monitoring event in December 2001:					291 gallons
Total volume purged during semi-annual and annual monitoring events:					596 gallons

* Monitoring well purged dry during sampling event.

3.0 GROUNDWATER ELEVATION, HYDRAULIC GRADIENT AND FLOW DIRECTION

Historical groundwater elevations for the monitoring wells are provided in Table 2. Water levels are not listed for the well points because the well points were specifically designed to detect free-phase product at discrete depth and the screen intervals do not correlate with the monitoring well screens. Groundwater elevation contour maps for the July 2001 and December 2001 monitoring events are depicted in Figure 1a and 1b, respectively.

The hydraulic gradient beneath the former Brickland Refinery is relatively level. The hydraulic gradient in July 2001 was approximately 0.001 foot per foot and groundwater flow direction is estimated to be S 29^0 E and appeared to be parallel to the Rio Grande. The hydraulic gradient and flow direction in December 2001 was almost identical to July since the water surface elevation drop in the wells was relatively uniform across the site.

Graphical plots of groundwater elevations versus time (1993 to present) for each monitoring well are presented in Appendix A. Groundwater levels in the monitoring wells are influenced by the stage of the Rio Grande bordering the site. Due to seasonal fluctuations in the river, water levels in the monitoring wells may vary as much as 2 to 3 feet over the course of a year. There was a sharp decline in the groundwater elevations between the two monitoring events in July and December.

Groundwater elevations in July 2001 correlate well with the higher levels measured during the summer months of previous years. Similarly, the groundwater elevations in December 2001 correlate well with the lower levels measured during the winter months of previous years.

Gage heights for the gage station located on the Rio Grande (near the Courchesne Bridge in west El Paso) in close proximity to the site were obtained from the International Boundary and Water Commission (IBWC). A graphical plot of gage heights versus time (1993 to present)

shows that during the summer months the Rio Grande is usually at its highest stage which is also strong correlation with the higher groundwater elevations measured during the same periods. The graphical plot of gage heights versus time is included in Appendix A.

Terracon

Table 2
Brickland Refinery
Monitoring Well Groundwater Elevations (feet above mean sea level)

Well ID	Jul. 93	12/08/1993	03/25/1994	07/12/1994	09/28/1994	12/13/1994	03/28/1995	06/21/1995	09/25/1995	06/20/1996	12/22/1996	06/27/1997
MW-1	3725.78	3724.30	3725.27	3726.54	3725.37	3724.35	NM	3726.66	NM	3725.72	3724.03	3726.31
MW-2	NM	NM	3726.39	3726.54	3725.89	3723.97	NM	3726.81	NM	3726.56	3724.67	3726.72
MW-3S	3725.29	3723.27	3725.20	3725.87	3724.50	3723.44	3725.35	3725.68	3724.98	3725.08	3723.10	3724.54*
MW-3D	3725.22	3723.30	3725.10	3725.78	3724.42	3723.35	3725.26	3725.75	3724.97	3725.00	3723.01	3725.46
MW-4	3725.21	3723.59	3725.36	3725.56	3724.68	3723.64	3725.56	3725.66	3725.40	3725.25	3723.31	3724.68
MW-5	3725.11	3723.59	3725.30	3725.88	3724.70	3723.65	3725.40	3725.86	3725.39	3725.37	3722.93	3724.17
MW-6S	3725.08	3723.78	3724.85	3725.55	3724.20	3723.03	3725.05	3725.53	3724.63	3724.83	3722.80	3725.29
MW-6D	3725.00	3723.75	3724.82	3725.57	3724.22	3723.00	3725.02	3725.48	3724.57	3724.75	3722.72	3725.25
MW-7	3725.16	3723.72	3725.16	3725.89	3724.46	3723.16	3725.36	3725.32	3725.23	NM	3723.16	3725.12
MW-8	3725.10	3723.42	3725.12	3725.77	3724.49	3723.45	3725.42	3725.74	3724.33	3725.29	3723.13	3724.21
MW-9S	3724.84	3723.52	3724.56	3725.29	3723.91	3722.81	3724.81	3725.21	3725.52	3724.49	3722.51	3724.84
MW-10	P	P	P	P	P	P	P	P	P	P	P	P
MW-11	3724.91	3722.90	3725.10	3725.75	P	3723.40	3725.35	3725.86	3724.98	3725.20	3723.10	3724.39
MW-12	3726.09	3724.91	3726.45	3727.05	3725.70	3723.65	NM	3727.15	3726.39	NM	3724.37	3726.34
MW-13	3725.22	NM	NM	3725.82	3724.71	3724.44	NM	3726.05	NM	3725.30	3723.27	3725.56
MW-14	NM	NM	NM	3726.03	3724.61	3723.58	3725.56	3726.01	3725.31	NM	3723.25	3725.07
MW-15	NM	NM	NM	3725.62	3724.28	3723.19	3724.97	3725.58	3724.87	NM	3721.90	3723.52
MW-16	NM	NM	NM	3725.43	3724.06	3722.93	3724.88	3725.44	3724.54	3724.65	3722.63	3723.59
MW-17	NM	NM	NM	3725.90	3724.46	3723.36	3725.38	3726.82	3726.05	NM	3723.07	3724.95

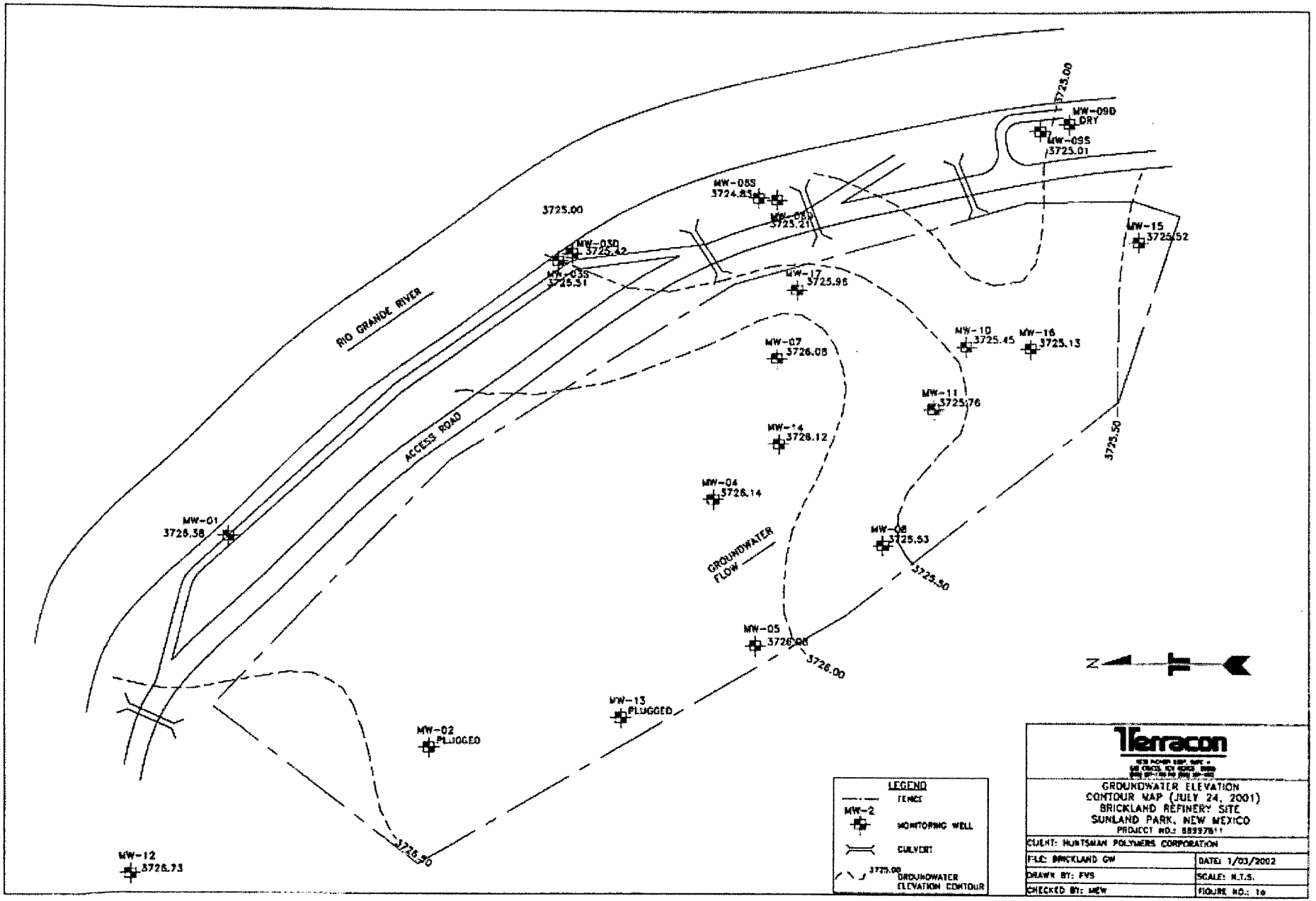
Notes: NM = Not measured.
P = Product observed.
* Remeasured in July.
D = Well Dry.

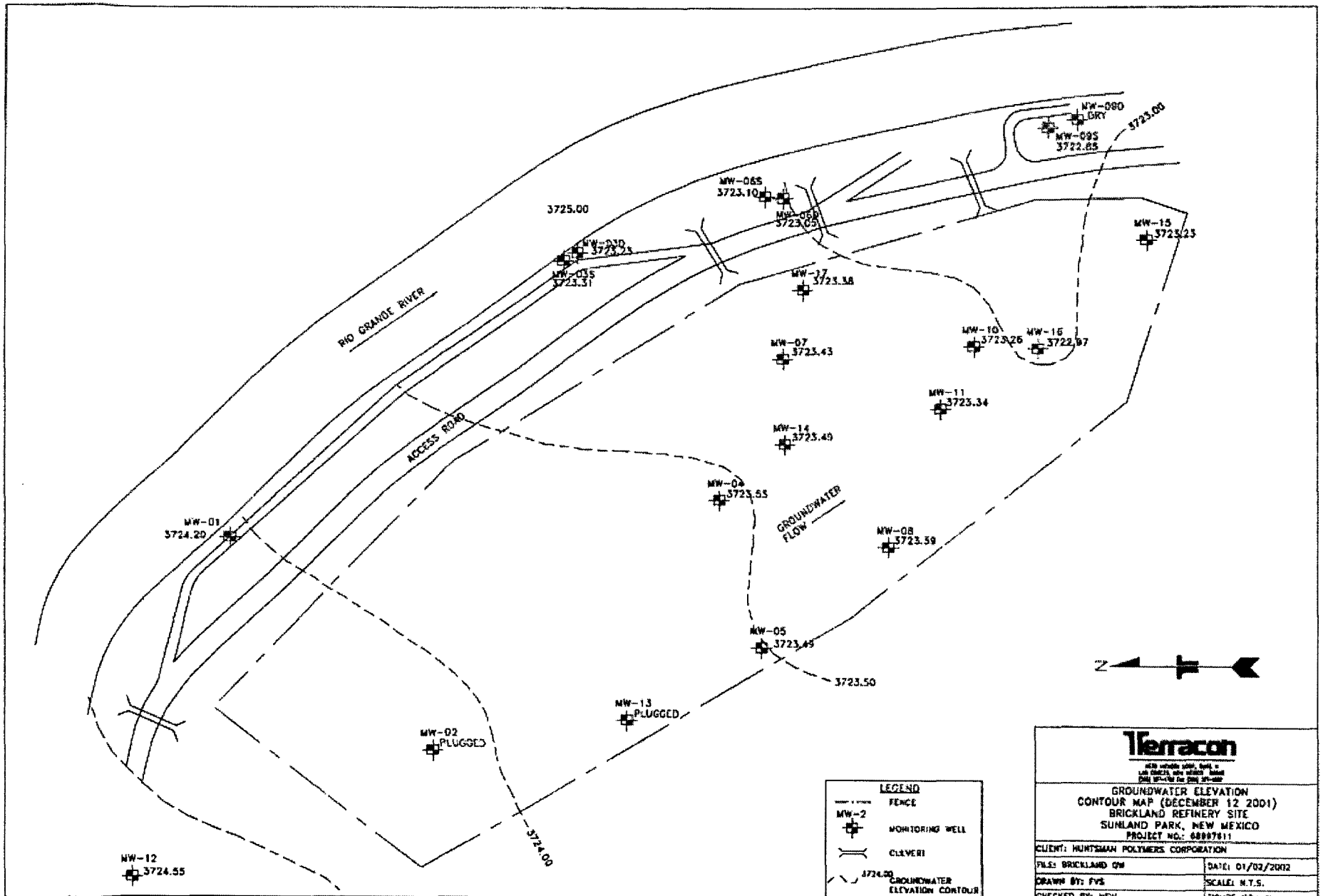
Terracon

Table 2 (cont)
Brickland Refinery
Monitoring Well Groundwater Elevations (feet above mean sea level)

Well ID	01/08/1998	06/24/1998	12/21/1998	06/01/1999	12/14/1999	06/12/2000	12/05/2000	07/24/2001	12/12/2001
MW-1	3724.13	3725.71	0.00	3725.85	3724.22	3725.68	3724.41	3726.38	3724.2
MW-2	3724.77	3728.47	0.00	3726.44	Plugged 6/99	Plugged 6/99	Plugged 6/99	PLUGGED	PLUGGED
MW-3S	3723.20	3724.58	0.00	3725.14	3723.32	3724.95	3723.5	3725.51	3723.31
MW-3D	3721.05	3725.14	0.00	3725.08	3723.24	3725.18	3723.43	3725.42	3723.23
MW-4	3723.44	3725.24	0.00	3725.34	3723.58	3725.27	3723.79	3726.14	3723.53
MW-5	3723.48	3724.38	0.00	3725.34	3723.58	3725.44	3723.82	3726.08	3723.49
MW-6S	3722.90	3724.97	0.00	3724.88	3723.09	3724.31	3723.23	3724.85	3723.1
MW-6D	3720.81	3724.9	Mar. 95	3724.84	3723.04	3724.92	3723.17	3725.21	3723.05
MW-7	3723.26	3725.31	0.00	3725.26	3723.46	3725.35	3723.63	3726.08	3723.43
MW-8	3722.31	3725.27	3725.56	3725.11	3723.43	3725.22	3723.64	3725.53	3723.39
MW-9S	3722.62	3725.79	3725.40	3724.55	3722.86	3724.62	3723.04	3725.01	3722.85
MW-10	P	P	P	P	P	P	P	3725.45	3723.26
MW-11	3723.15	3725.20	3725.42	3725.05	3723.34	3725.04	3723.52	3725.76	3723.34
MW-12	NM	3726.48	3725.35	3726.40	3724.59	3726.53	3724.73	3726.73	3724.55
MW-13	3723.55	3725.34	0.00	3725.25	Plugged 6/99	Plugged 6/99	Plugged 6/99	PLUGGED	PLUGGED
MW-14	3723.35	3725.38	3725.56	3725.36	3723.54	3725.41	3723.73	3726.12	3723.49
MW-15	3722.99	3728.60	3724.97	3724.87	3723.24	3724.98	3723.42	3725.52	3723.23
MW-16	3722.75	3725.02	3724.88	3724.68	3722.97	3724.80	3723.16	3725.13	3722.97
MW-17	D	3725.09	3725.38	3725.25	3723.36	3725.27	3723.5	3725.96	3723.38

Notes: NM = Not measured.
P = Product observed.
* Remeasured in July.
D = Well Dry.
Plugged 6/99 = Monitoring well abandoned (in accordance with NMED regulations) prior to soil cap installation in June 1999


RIO GRANDE RIVER
ACCESS ROAD
GROUNDWATER FLOW
3725.00
MW-09D DRY
MW-09S 3725.01
MW-08S 3724.83
MW-08D 3725.21
MW-15 3725.52
MW-03D 3725.42
MW-03S 3725.51
MW-17 3725.98
MW-10 3725.45
MW-16 3725.13
MW-07 3726.08
MW-11 3725.76
MW-14 3726.12
3725.50
MW-04 3726.14
MW-01 3726.38
MW-06 3725.53
3725.50
MW-05 3726.08
3726.00
MW-13 PLUGGED
MW-02 PLUGGED
3726.50
MW-12 3726.73
N
LEGEND
FENCE
MW-2 MONITORING WELL
CULVERT
3725.00 GROUNDWATER ELEVATION CONTOUR
Terracon
GROUNDWATER ELEVATION CONTOUR MAP (JULY 24, 2001)
BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
PROJECT NO.: 8899781
CLIENT: HUNTSMAN POLYMERS CORPORATION
FILE: BRICKLAND GW
DATE: 1/03/2002
DRAWN BY: FVS
SCALE: N.T.S.
CHECKED BY: MEW
FIGURE NO.: 10


RIO GRANDE RIVER
ACCESS ROAD
GROUNDWATER FLOW
3725.00
3723.50
3724.00
MW-01
3724.20
MW-02
PLUGGED
MW-03D
3723.25
MW-03S
3723.31
MW-04
3723.55
MW-05
3723.49
MW-06D
3723.10
MW-06S
3723.05
MW-07
3723.43
MW-08
3723.59
MW-08D
DRY
MW-08S
3722.85
MW-10
3723.26
MW-11
3723.34
MW-12
3724.55
MW-13
PLUGGED
MW-14
3723.49
MW-15
3725.23
MW-16
3722.97
MW-17
3723.38
N
LEGEND
FENCE
MW-2
MONITORING WELL
CULVERT
3724.00
GROUNDWATER ELEVATION CONTOUR
Terracon
GROUNDWATER ELEVATION CONTOUR MAP (DECEMBER 12 2001)
BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
PROJECT NO.: 68997611
CLIENT: HUNTSMAN POLYMERS CORPORATION
FILE: BRICKLAND GW
DATE: 01/02/2002
DRAWN BY: FVS
SCALE: N.T.S.
CHECKED BY: MEW
FIGURE NO.: 1b

4.0 GROUNDWATER QUALITY CONDITIONS

4.1 Distribution of Hydrocarbons (BTEX) in Groundwater

A historical listing of benzene, toluene, ethylbenzene and xylenes (BTEX) concentrations for five offsite monitoring wells (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S) and four on-site monitoring wells (MW-4, MW-7, MW14, and MW-15) is summarized in Table 3. This table lists BTEX concentrations for the period from December 1993 to December 2001. BTEX concentrations for sampling events prior to December 1993 are included in previously submitted reports.

4.1.1 Analyses

Laboratory results from the July 2001 sampling event indicate that benzene concentrations were above NMWQCC standards in three wells, MW-4 (196 g/L), MW-6S (12 g/L), and MW-9S (35 g/L). For the remaining wells and river samples, MW-14 was the only other sample in which benzene was detected. Trace concentrations of toluene and ethylbenzene were detected in MW-6S; 14 g/L and 15 g/L, respectively, while toluene was detected in MW-7 (14 g/L), and MW-14 (3 g/L). Traces of toluene and ethylbenzene were detected in the two river samples: 3 g/L of toluene and 3 g/L of ethylbenzene in the upstream sample, and 3 g/L of toluene in the downstream sample.

Laboratory results for the December 2001 sampling event indicate that the benzene concentration exceeded NMWQCC standards only in MW-4 (54.6 g/L). Benzene was also detected in three other wells; MW-6D (1.1 g/L), MW-9S (2.9 g/L), and MW-14 (1.1 g/L), but was well below the action level of 10 g/L. The other three parameters were either not detected in the samples or they were significantly below NMWQCC Standards.

Hydrocarbon concentration maps displaying the BTEX concentrations for the two 2001 sampling events are presented in Figure 2a (July 27-August 2, 2001) and Figure 2b (December 13-14, 2001). BTEX concentrations in groundwater versus time for all nine monitoring wells MW-3S, MW-3D, MW-4, MW-6S, MW-6D, MW-7, MW-9S, MW-14, and MW-15, are depicted in Figures 3a through 3i, respectively. The laboratory reports and Chain of Custody (COC) documentation are included in Appendix B.

4.1.2 Comparison to Prior Data

Since the ending of 1998 through 2000, the five wells located on the eastern perimeter of the site, MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S, have exhibited BTEX concentration levels below the NMWQCC standards. Prior to December of 1998, monitoring well MW-6S consistently exhibited benzene concentrations above NMWQCC standards. For the July 2001 semi-annual monitoring event MW-6S again exhibited benzene concentrations above NMWQCC standards. For the same period, MW-9S also had benzene concentrations above NMWQCC standards.

The BTEX results from the four on-site wells (MW-4, MW-7, MW-14, and MW-15) indicate a decline in benzene and hydrocarbon concentration on the site over the previous years investigations. MW-4 was the only on-site well that exhibited a benzene concentration above NMWQCC standards in the December 2001 monitoring. All other analytes were either below laboratory detection limits or below NMWQCC standards.

4.2 Distribution of Hydrocarbons (PAH) in Groundwater and Surface Water

Historical analytical results for polynuclear aromatic hydrocarbons (PAH) for five offsite monitoring wells (MW-3S, MW-3D, MW-6S, MW-6D, and MW-9S) and four on-site monitoring wells (MW-4, MW-7, MW14, and MW-15) indicate that no PAH has been detected since 1999. No PAH has been detected in the four on-site wells since late 1994. Similarly, no PAH has been detected in the river samples since the sampling of the river begun in 1996. However, during the July 2001 sampling event, the duplicate sample collected from well MW-14 for PAH analysis was broken in transport to the laboratory and the well had to be re-sampled. The replacement sample showed a naphthalene concentration of 0.034mg/L, which is believed to be the result of laboratory contamination. Based on the results of the analyses including the original MW-14 sample collected for PAH analysis in the July 2001 monitoring event, it appears that groundwater under the site has not been adversely impacted by PAHs. Nor has the surface water in close proximity to the site been impacted by PAHs. As a result, no PAH concentration map was constructed. The results of the PAH analyses date back to December 1993 and are listed in Table 4. PAH concentrations for sampling events prior to December 1993 are included in previously submitted reports.

4.3 Distribution of Priority Pollutant Metals in Groundwater and Surface Water

Historical groundwater sample and surface water (Rio Grande) sample analytical results, 1996 through 2001, for Priority Pollutant metals (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc) are presented in Table 5. Seven metals (aluminum, barium, boron, cobalt, iron, manganese, and molybdenum) were added to the list for 2001, since they are regulated metals under NMOCD standards. The NMWQCC standards are also listed in the tables for comparison. Constituents with concentrations above the NMWQCC standards are highlighted in boldface type. Analytical results for years prior to 1996 are included in previously submitted reports. The results of the analyses for metals for the 2001 semi-annual monitoring event indicate that iron and manganese concentrations exceeded NMWQCC standards in water samples collected from the river (which also exhibited aluminum concentrations above NMWQCC standards, both upstream and downstream), and groundwater samples collected from all wells except MW-6D. Additionally, aluminum, boron, and chromium levels exceeded NMWQCC standards in monitoring well MW-9S; and boron levels exceeded NMWQCC standards in

monitoring wells MW-3D, MW-4, MW-6S, MW-6D, MW-14, and MW-15. Minor concentrations of the other listed metals were detected, but were below NMWQCC standards.

4.4 Analytical and QA/QC Data

The laboratory analysis sheets, the documentation of laboratory testing equipment calibration, and the chain of custody letters are included in Appendix B.

Terracon

Table 3
Brickland Refinery
BTEX Concentrations (µg/L) in Monitoring Wells and River Surface Water Samples
December 1993 through December 2001

MW-3S

Parameter	12/08/93	03/25/94	07/12/94	09/28/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	07/11/1997	########	06/25/1998	12/21/1998	########	12/14/1999	06/14/2000	12/08/2000	07/31/2001	12/14/2001
Benzene	ND	ND	0.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Toluene	ND	4.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Ethyl Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.9	ND	ND	ND	<1	<1
Xylenes	ND	18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5	ND	ND	ND	<1	<1

MW-3D

Parameter	12/08/93	03/23/94	07/12/94	09/28/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	06/26/1997	########	06/25/1998	12/21/1998	########	12/14/1999	06/14/2000	12/08/2000	08/01/2001	12/14/2001
Benzene	ND	ND	0.6	ND	ND	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Ethyl Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND	2	ND	<1	<1

MW-4

Parameter	12/08/93	03/25/94	07/12/94	09/27/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	07/11/1997	########	06/25/1998	12/23/1998	########	12/14/1999	06/02/1999	12/08/2000	8/1/01	12/13/2001
Benzene	NS	130/110	1800	2000	220	220	NS	2200	NS	NS	NS	NS	NS	NS	NS	NS	400	1120/1050	196	54.6
Toluene	NS	ND/ND	12	ND	ND	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND, ND	<5*	1.8
Ethyl Benzene	NS	2.5/1.6	50	ND	ND	6	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	1.8	ND, ND	<5*	<1*
Xylenes	NS	ND/ND	ND	ND	ND	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	5.1	34, ND	<5*	<1*

Parameter	WQCC Std (µg/L)	Detection Limit
Benzene	10	1.0 µg/L
Toluene	750	1.0 µg/L
Ethyl Benzene	750	1.0 µg/L
Xylenes	620	1.0 µg/L

Notes

NA = Not available
ND = Not detected
NS = Not sampled
µg/L = Micrograms per liter
* Detection limits for the same analyte may vary due to sample dilution

Table 3 (cont)
Brickland Refinery
BTEX Concentrations (µg/L) in Monitoring Wells and River Surface Water Samples
December 1993 through December 2001

MW-6S

Parameter	12/08/93	03/25/94	07/12/94	09/28/94	12/13/94	03/28/95	06/21/95	09/25/1995	06/21/1996	12/23/1996	06/26/1997	########	06/25/1998	12/22/1998	########	12/14/1999	06/14/2000	12/07/2000	07/31/2001	12/14/2001
Benzene	71	74	110	4.8	59	110	NS	180	330	50	130	14	130	ND	4.3, 6.4	ND	2.6	ND	12	<5
Toluene	ND	ND	ND	2.8	ND	7	NS	120	160	ND	ND	ND	ND	ND	2.2, 2.2	ND	ND, 2.2	ND	14	<5
Ethyl Benzene	52	12	30	34	ND	32	NS	ND	ND	ND	15	ND	40	ND	3.3, 4.1	ND	2.1	ND	15	<5
Xylenes	ND	7.6	88	16	ND	43	NS	30	90	ND	ND	ND	ND	ND	ND, 2.2	ND	4.1	ND	<5	<5

MW-6D

Parameter	12/08/93	03/23/94	07/12/94	09/28/94	12/13/94	03/28/95	06/21/95	09/25/1995	06/21/1996	12/23/1996	06/26/1997	########	06/25/1998	12/22/1998	########	12/14/1999	06/14/2000	12/07/2000	07/31/2001	12/14/2001
Benzene	ND	ND	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND, ND	ND	ND	ND	ND	ND	<1	1.1
Toluene	ND	ND	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND, ND	ND	ND	ND	ND	ND	<1	<1
Ethyl Benzene	ND	ND	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND, ND	ND	ND	ND	ND	ND	<1	<1
Xylenes	ND	1.6	ND	ND	ND	ND	ND	ND,ND	ND	ND	ND	ND	ND, ND	ND	ND	ND	1.7	ND	<1	<1

MW-7

Parameter	12/08/93	03/25/94	07/12/94	09/27/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	07/11/1997	########	06/25/1998	12/23/1998	########	12/14/1999	06/13/2000	12/08/2000	07/27/2001	12/13/2001
Benzene	NS	31	ND	ND	36	100	NS	4.9	NS	NS	NS	NS	NS	NS	NS	NS	74, 76	ND	<5	<1
Toluene	NS	ND	ND	ND	ND	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	ND,ND	ND	14	<1
Ethyl Benzene	NS	2.1	ND	3.6	ND	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	ND, ND	ND	<5	<1
Xylenes	NS	0.6	3.2	1.3	ND	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	2.5, 1.6	ND	<5	<1

Parameter	WQCC Std.(µg/L)	Detection Limit
Benzene	10	1.0 µg/L
Toluene	750	1.0 µg/L
Ethyl Benzene	750	1.0 µg/L
Xylenes	620	1.0 µg/L

Notes
NA = Not available
ND = Not detected
NS = Not sampled
µg/L = Micrograms per liter
* Detection limits for the same analyte may vary due to sample dilution

Table 3 (cont)
Brickland Refinery
BTEX Concentrations (µg/L) in Monitoring Wells and River Surface Water Samples
December 1993 through December 2001

MW-9S

Parameter	12/08/93	03/25/94	07/12/94	09/27/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	06/26/1997	########	06/25/1998	12/22/1998	########	12/14/1999	06/14/2000	12/07/2000	08/01/2001	12/14/2001
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND,ND	1.9	ND, ND	ND	ND	ND	ND	35	2.9
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND,ND	2.7	2.7, ND	2.2	ND	14	ND	<5	2
Ethyl Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND,ND	1.5	4.5, ND	2.5	ND	6.2	ND	<5	<1
Xylenes	ND	ND	0.6	ND	ND	0.6	ND	ND	ND	ND	ND	ND,ND	6.6	6.7, ND	24	8	43	ND	<5	1.9

MW-14

Parameter	12/08/93	03/25/94	07/12/94	09/27/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	07/11/1997	########	06/25/1998	12/23/1998	########	12/14/1999	06/13/2000	12/08/2000	08/02/2001	12/13/2001
Benzene	*	*	23000	2900	930	1100	NS	5.7	NS	NS	NS	NS	NS	NS	NS	NS	250	2630	7,7	1.1,2.0
Toluene	*	*	ND	ND	ND	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	3,3	<1,<1
Ethyl Benzene	*	*	ND	ND	ND	25	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	2.9	ND	<1,<1	<1,<1
Xylenes	*	*	ND	ND	ND	ND	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	5	ND	<1,<1	<1,<1

MW-15

Parameter	12/08/93	03/25/94	07/12/94	09/27/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	07/11/1997	########	06/25/1998	12/23/1998	########	12/14/1999	06/13/2000	12/07/2000	07/27/2001	12/13/2001
Benzene	**	**	34	270	290	NA	NS	90	NS	NS	NS	NS	NS	NS	NS	NS	1.9	ND	<5	<5
Toluene	**	**	ND	ND	ND	NA	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	<5	<5
Ethyl Benzene	**	**	13	21	ND	NA	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	<5	<5
Xylenes	**	**	13	60	ND	NA	NS	ND	NS	NS	NS	NS	NS	NS	NS	NS	2.7	ND	<5	<5

Parameter	WQCC Std.(µg/L)	Detection Limit
Benzene	10	1.0 µg/L
Toluene	750	1.0 µg/L
Ethyl Benzene	750	1.0 µg/L
Xylenes	620	1.0 µg/L

Notes
NA = Not available
ND = Not detected
NS = Not sampled
µg/L = Micrograms per liter
* Well was installed 6/19/94
** Well was installed 6/21/94

Table 3 (cont)
Brickland Refinery
BTEX Concentrations (µg/L) in Monitoring Wells and River Surface Water Samples
December 1993 through December 2001

River - Upstream

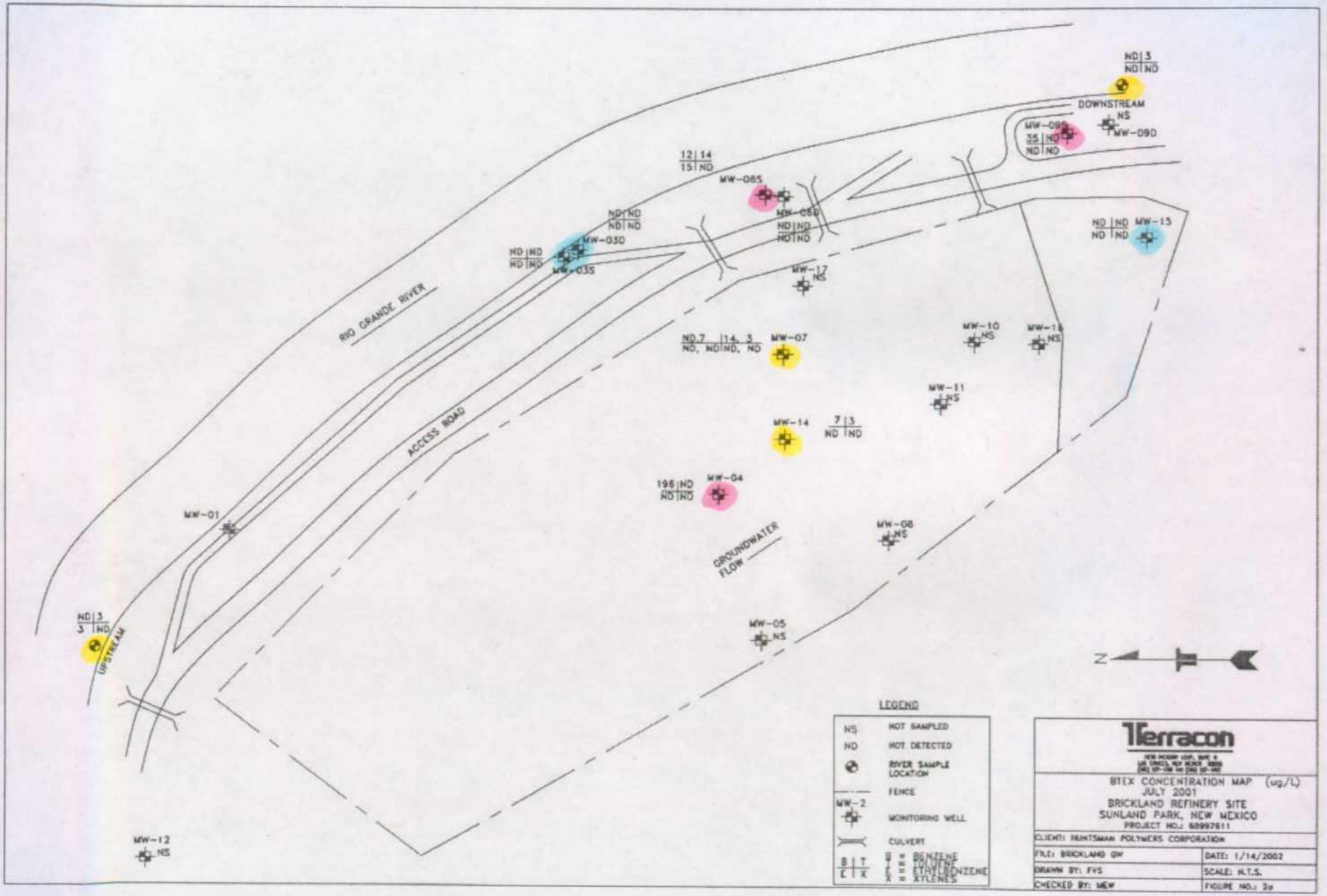
Parameter	12/08/93	03/25/94	07/12/94	09/27/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	07/11/1997	########	06/25/1998	12/23/1998	########	12/14/1999	06/13/2000	12/08/2000	08/01/2001	12/14/2001
Benzene	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Toluene	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	<1
Ethyl Benzene	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	<1
Xylenes	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1	<1

River - Downstream

Parameter	12/08/93	03/25/94	07/12/94	09/27/94	12/13/94	03/28/95	06/21/95	09/26/95	06/21/1996	12/23/1996	06/26/1997	########	06/25/1998	12/22/1998	########	12/14/1999	06/13/2000	12/08/2000	08/01/2001	12/14/2001
Benzene	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Toluene	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	<1
Ethyl Benzene	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1	<1
Xylenes	NS	NS	NS	NS	NS	NS	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	<1	<1

Parameter	WQCC Std.(µg/L)	Detection Limit
Benzene	10	1.0 µg/L
Toluene	750	1.0 µg/L
Ethyl Benzene	750	1.0 µg/L
Xylenes	620	1.0 µg/L

Notes
NA = Not available
ND = Not detected
NS = Not sampled
µg/L = Micrograms per liter
* Detection limits for the same analyte may vary due to sample dilution


ND | 3
ND | ND
DOWNSTREAM
NS
MW-09S
MW-09D
35 | ND
ND | ND
12 | 14
15 | ND
MW-08S
MW-08D
ND | ND
ND | ND
MW-03D
ND | ND
ND | ND
MW-03S
MW-17
NS
ND | ND
ND | ND
MW-15
RIO GRANDE RIVER
ND, 7 | 14, 3
ND, ND | ND, ND
MW-07
MW-10
NS
MW-16
NS
MW-11
NS
ACCESS ROAD
MW-14
7 | 3
ND | ND
196 | ND
ND | ND
MW-04
MW-01
GROUNDWATER FLOW
MW-08
NS
ND | 3
3 | ND
UPSTREAM
MW-05
NS
MW-12
NS
N
LEGEND
NS NOT SAMPLED
ND NOT DETECTED
RIVER SAMPLE LOCATION
FENCE
MW-2 MONITORING WELL
CULVERT
B | T
E | X
B = BENZENE
T = TOLUENE
E = ETHYLBENZENE
X = XYLENES
Terracon
BTEX CONCENTRATION MAP (ug/L)
JULY 2001
BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
PROJECT NO.: 62997611
CLIENT: HUNTSMAN POLYMERS CORPORATION
FILE: BRICKLAND GW
DATE: 1/14/2002
DRAWN BY: FVS
SCALE: N.T.S.
CHECKED BY: MEW
FIGURE NO.: 3a

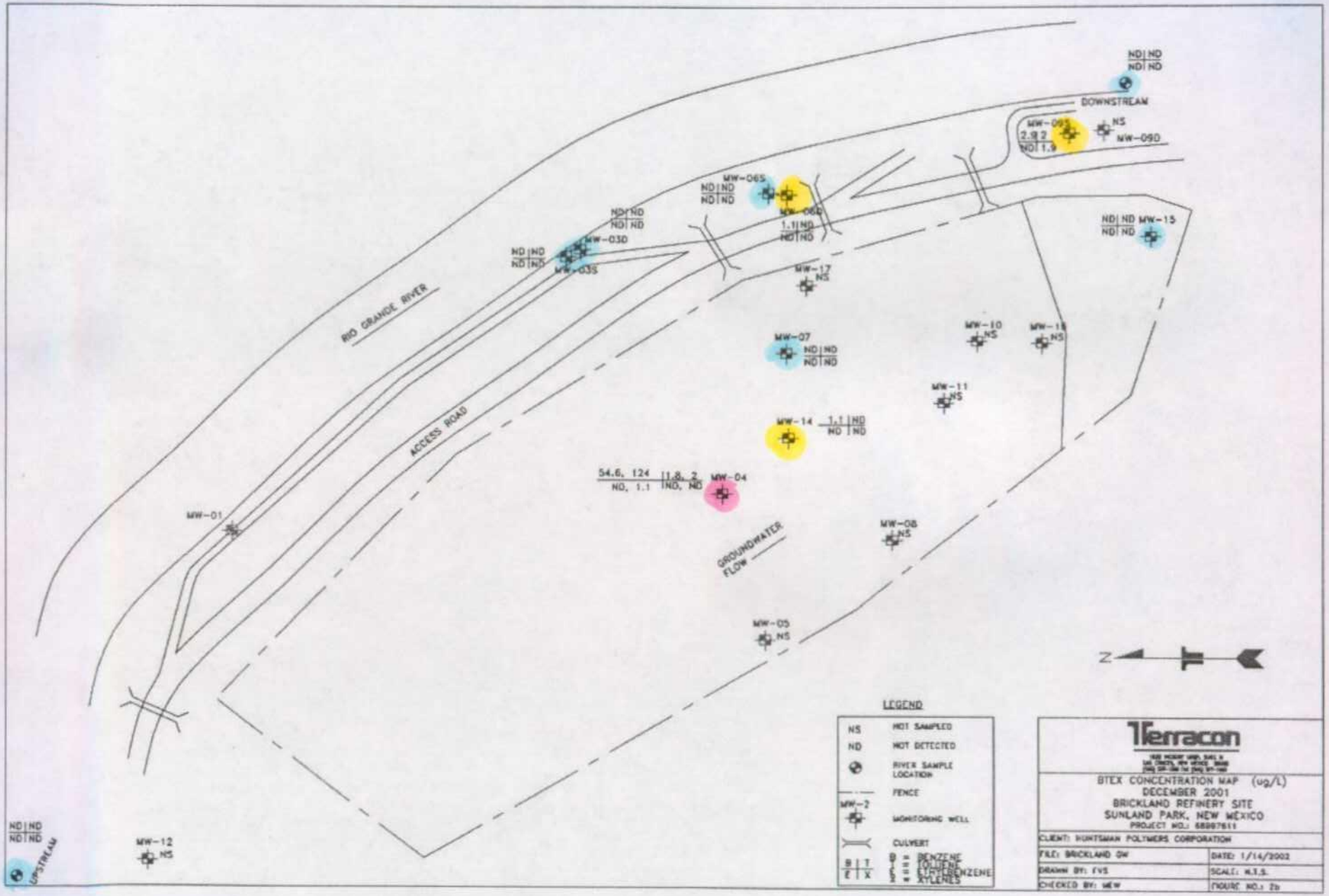
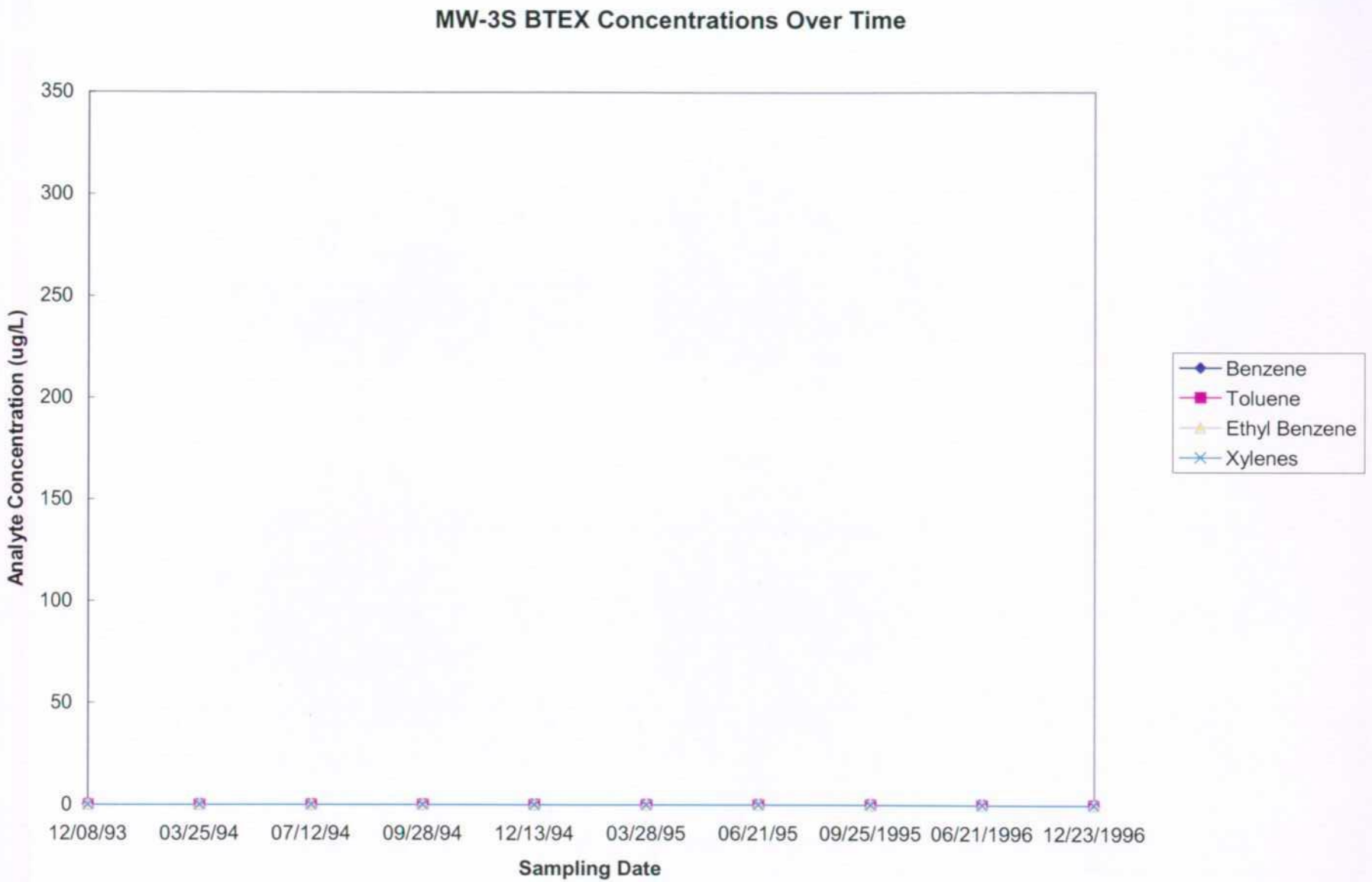
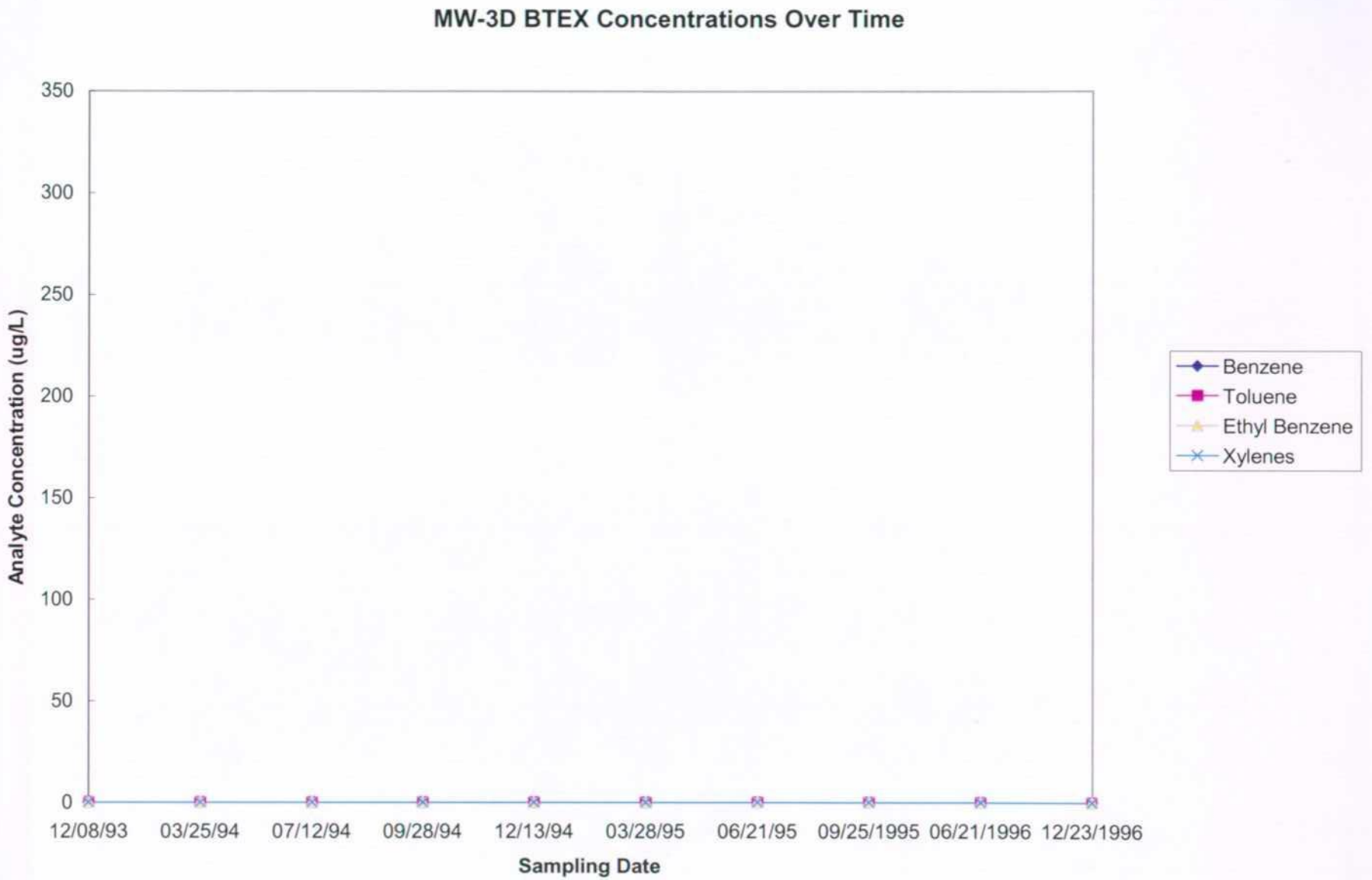

ND | ND
ND | ND
DOWNSTREAM
MW-09S
2.9 2
ND | 1.9
NS
MW-09D
MW-06S
ND | ND
ND | ND
MW-06D
1.1 | ND
ND | ND
ND | ND
ND | NS
MW-03D
MW-03S
MW-17
NS
ND | ND MW-15
ND | ND
RIO GRANDE RIVER
ACCESS ROAD
MW-07
ND | ND
ND | ND
MW-10
NS
MW-18
NS
MW-11
NS
MW-14
1.1 | ND
ND | ND
54.6, 124
ND, 1.1
11.8, 2
ND, ND
MW-04
MW-01
GROUNDWATER FLOW
MW-08
NS
MW-05
NS
N
ND | ND
ND | ND
UPSTREAM
MW-12
NS
LEGEND
NS NOT SAMPLED
ND NOT DETECTED
RIVER SAMPLE LOCATION
FENCE
MW-2 MONITORING WELL
CULVERT
B | T
E | X
B = BENZENE
T = TOLUENE
E = ETHYLBENZENE
X = XYLENES
Terracon
BTEX CONCENTRATION MAP (ug/L)
DECEMBER 2001
BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
PROJECT NO.: 68897611
CLIENT: HUNTSMAN POLYMERS CORPORATION
FILE: BRICKLAND GW
DATE: 1/14/2002
DRAWN BY: FVS
SCALE: N.T.S.
CHECKED BY: MEW
FIGURE NO.: 2b

Figure 3a



~3459907.xls (MW-3S BTEX)

Figure 3b



~3459907.xls (MW-3D BTEX)

Figure 3c
Brickland Refinery
MW-4 BTEX Concentrations Over Time

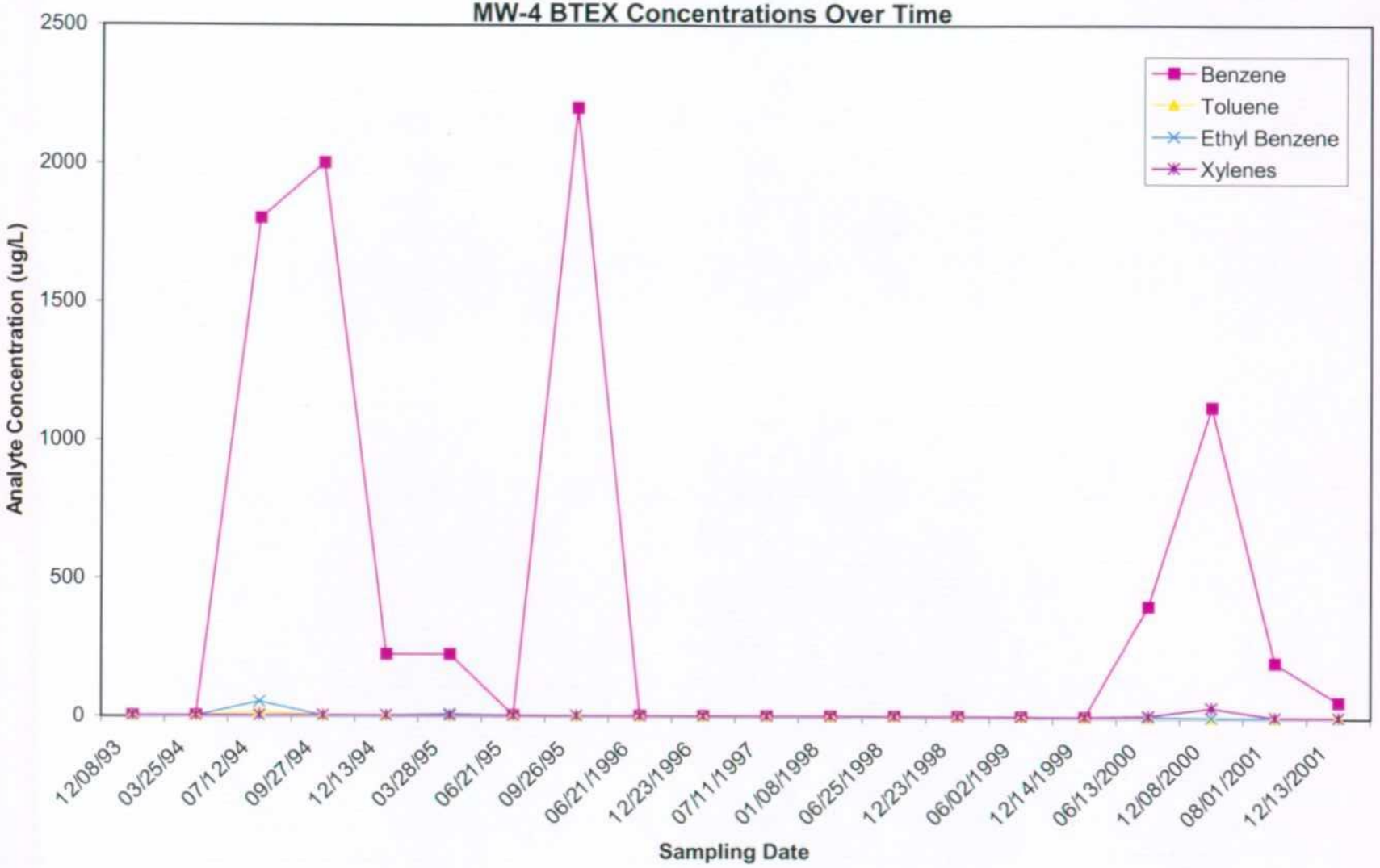
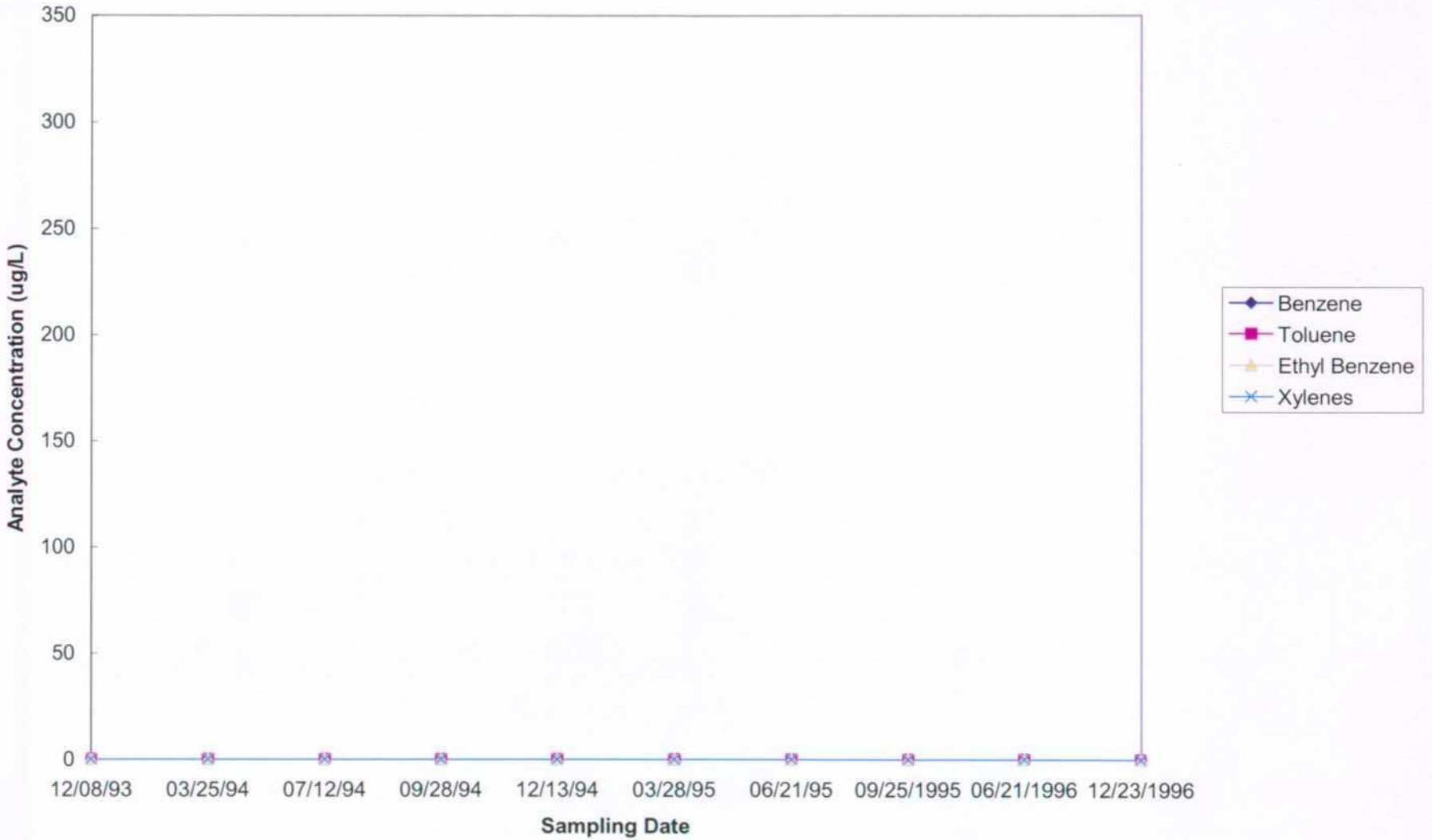


Figure 3a

Brickland Refinery

MW-3S BTEX Concentrations Over Time

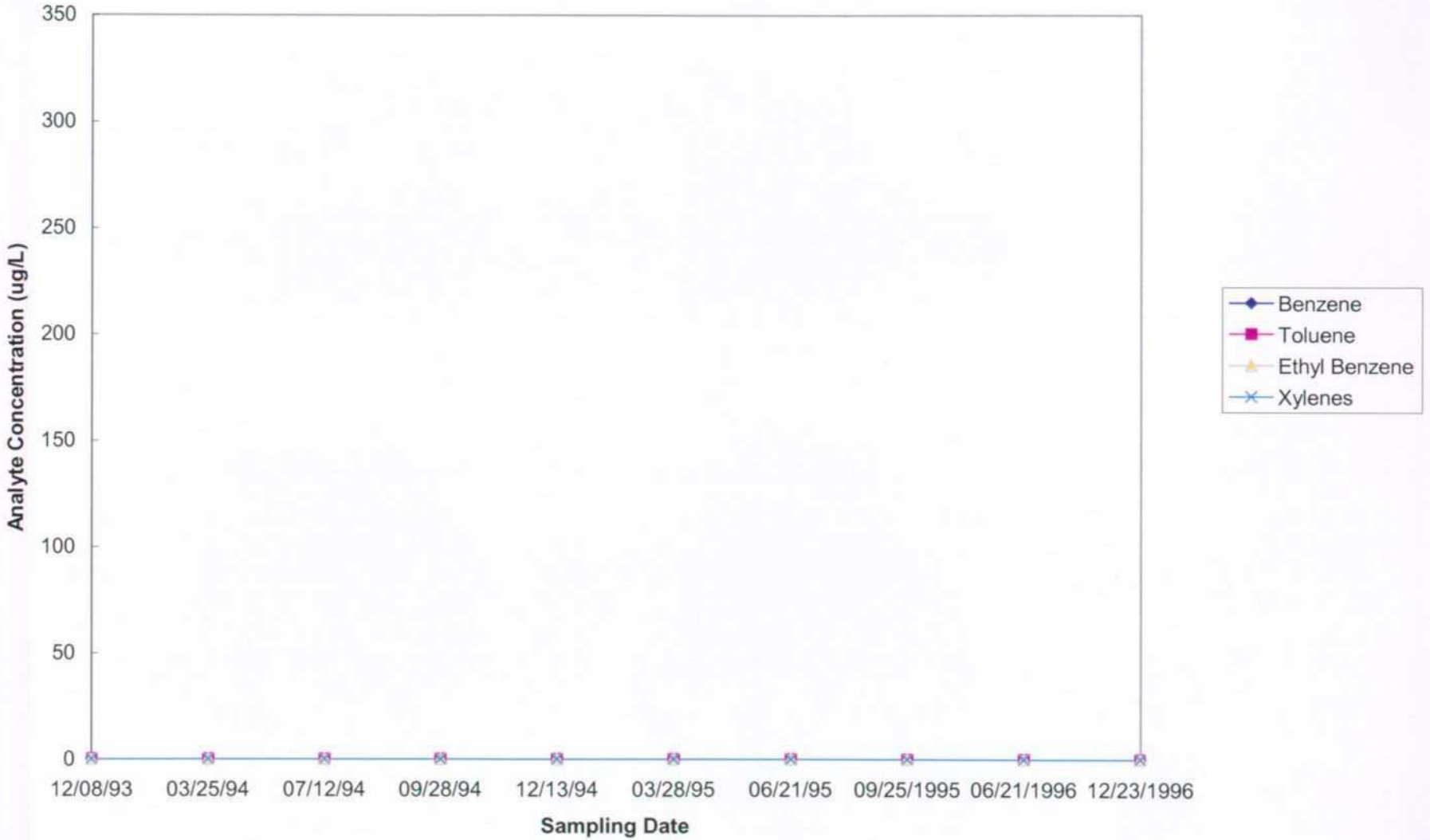


~3459907.xls (MW-3S BTEX)

Figure 3b

Brickland Refinery

MW-3D BTEX Concentrations Over Time



~3459907.xls (MW-3D BTEX)

Figure 3d
Brickland Refinery
MW-6S BTEX Concentrations Over Time

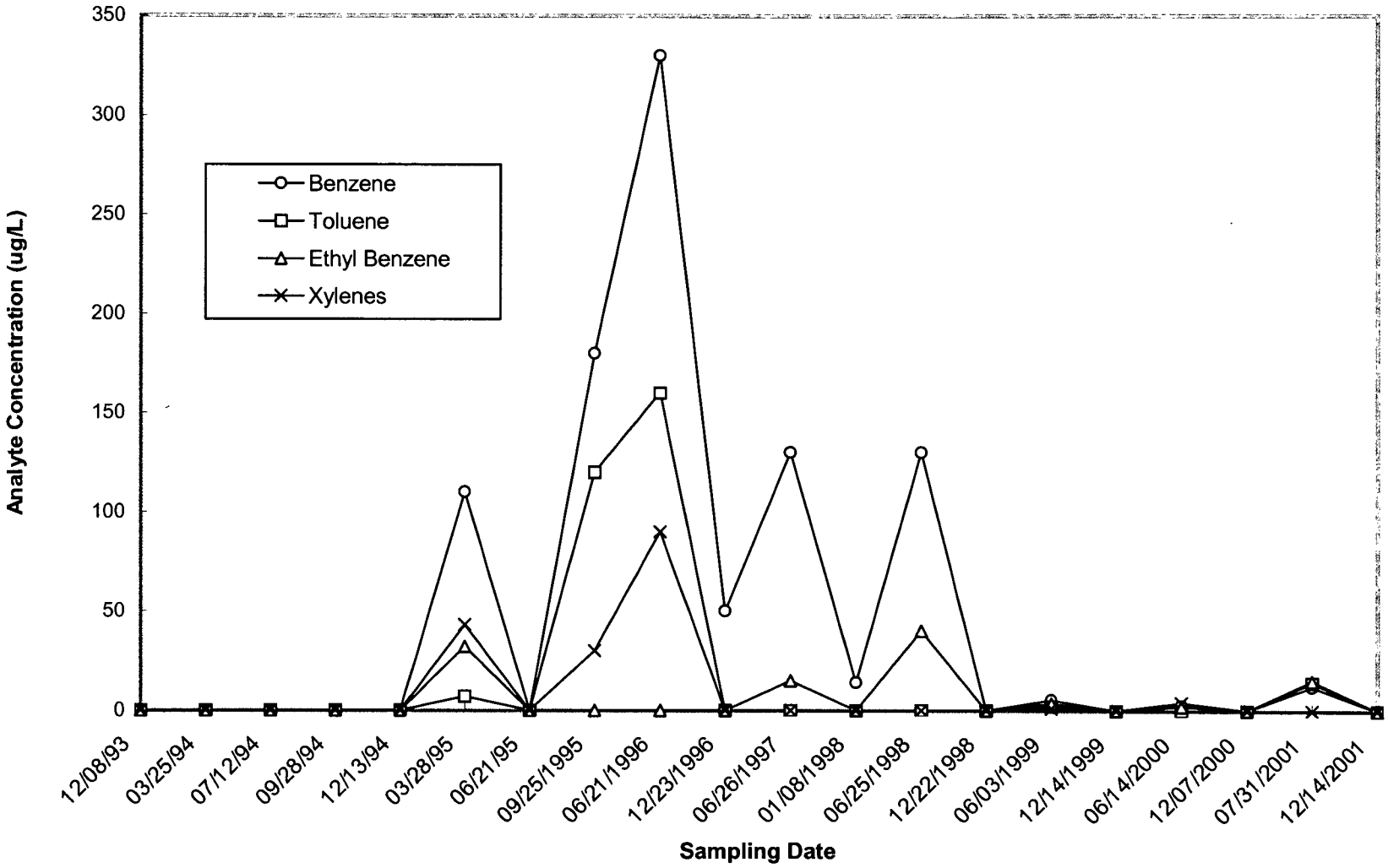
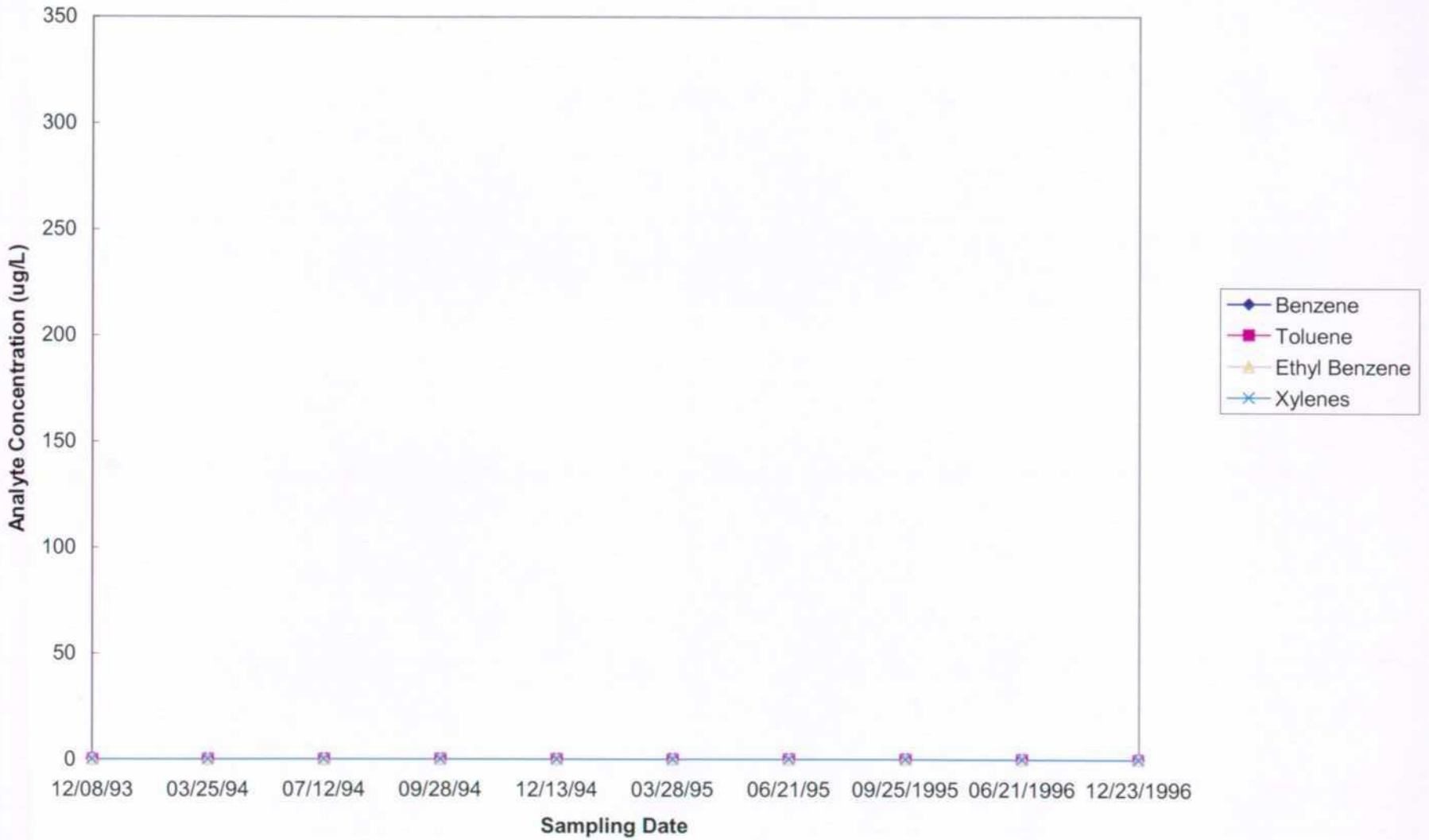


Figure 3e

Brickland Refinery

MW-6D BTEX Concentrations Over Time



~3459907.xls (MW-6D BTEX)

Figure 3f
Brickland Refinery
MW-7 BTEX Concentrations Over Time

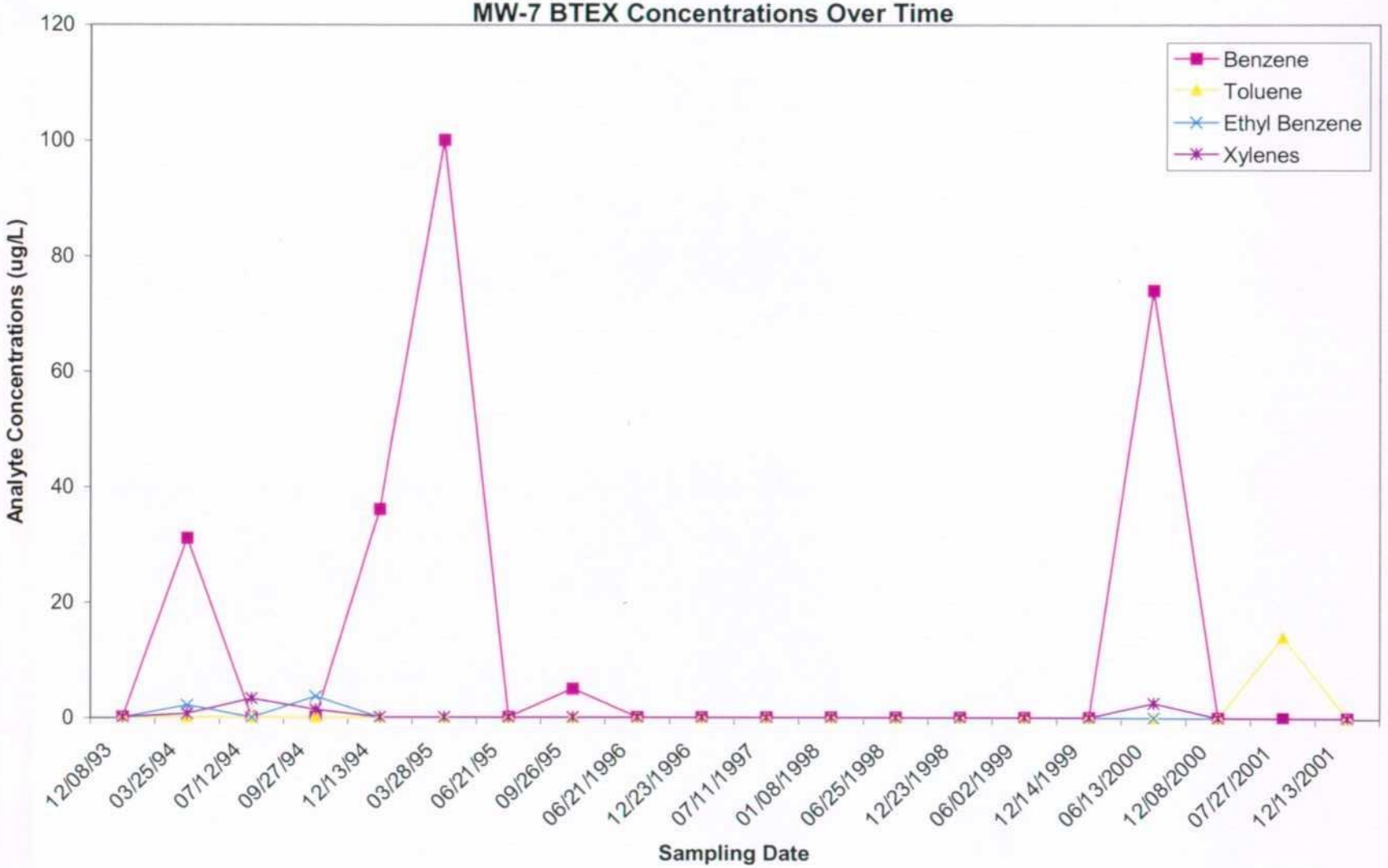


Figure 3h
Brickland Refinery
MW-14 BTEX Concentrations Over Time

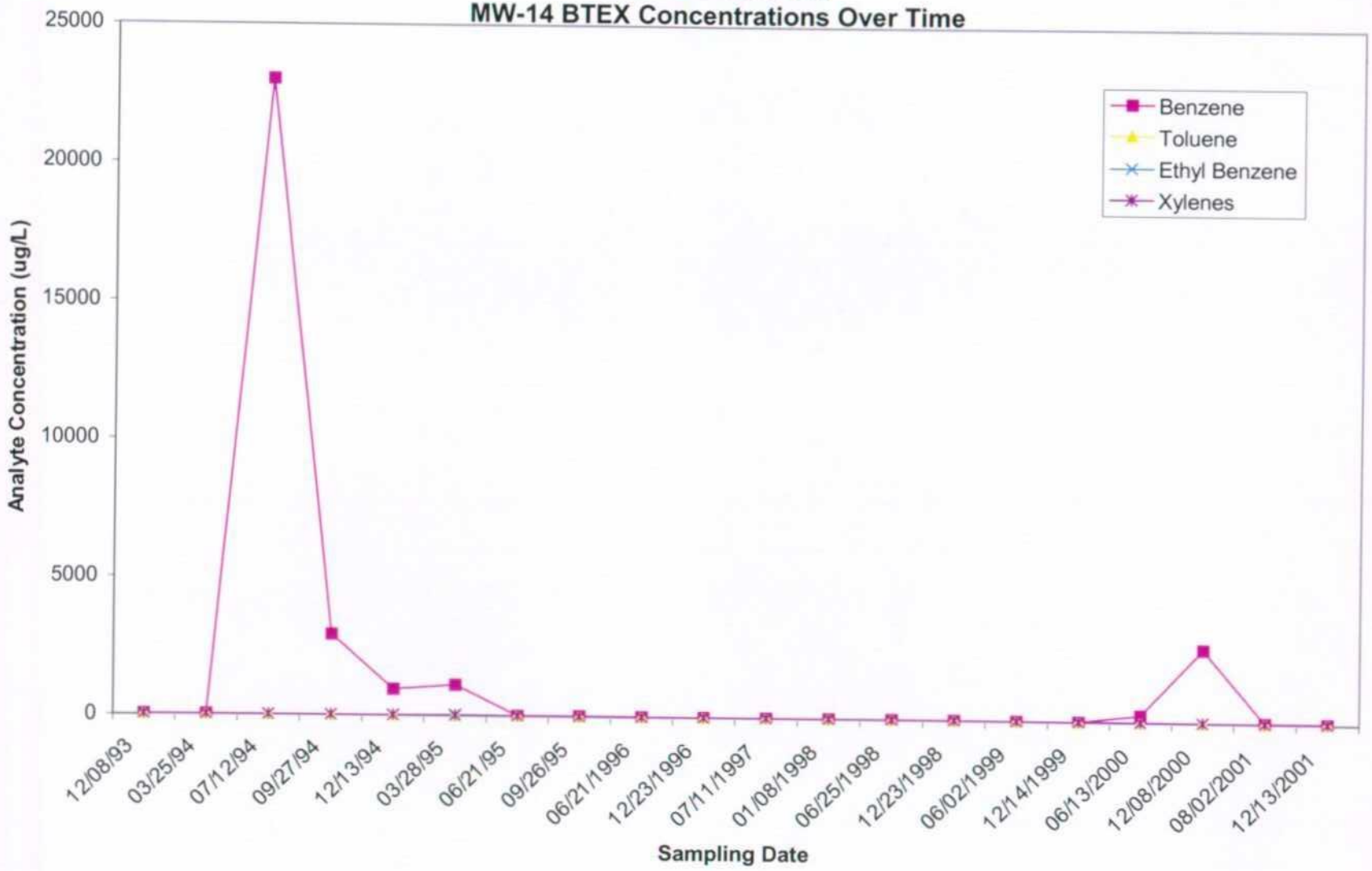
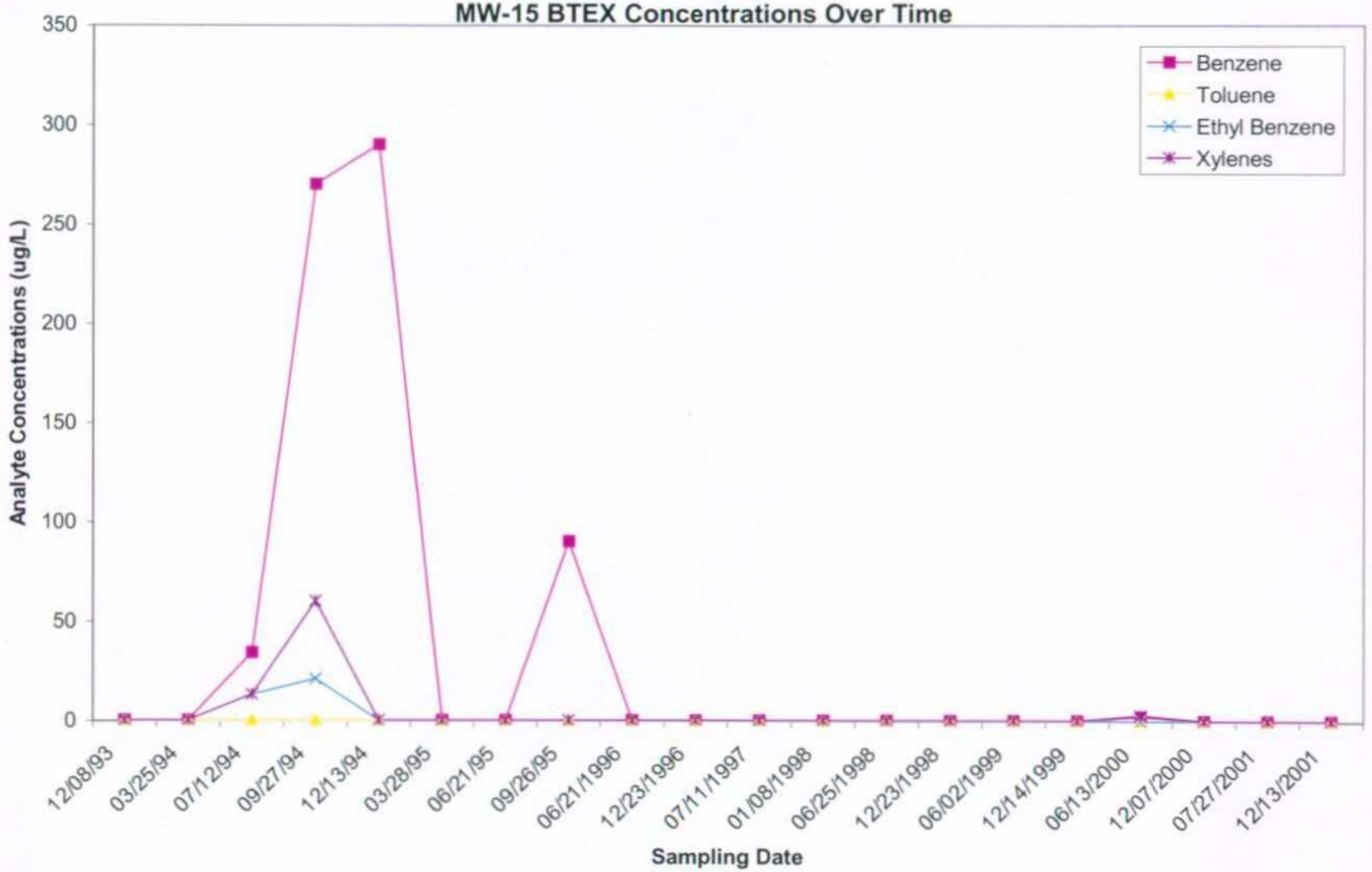
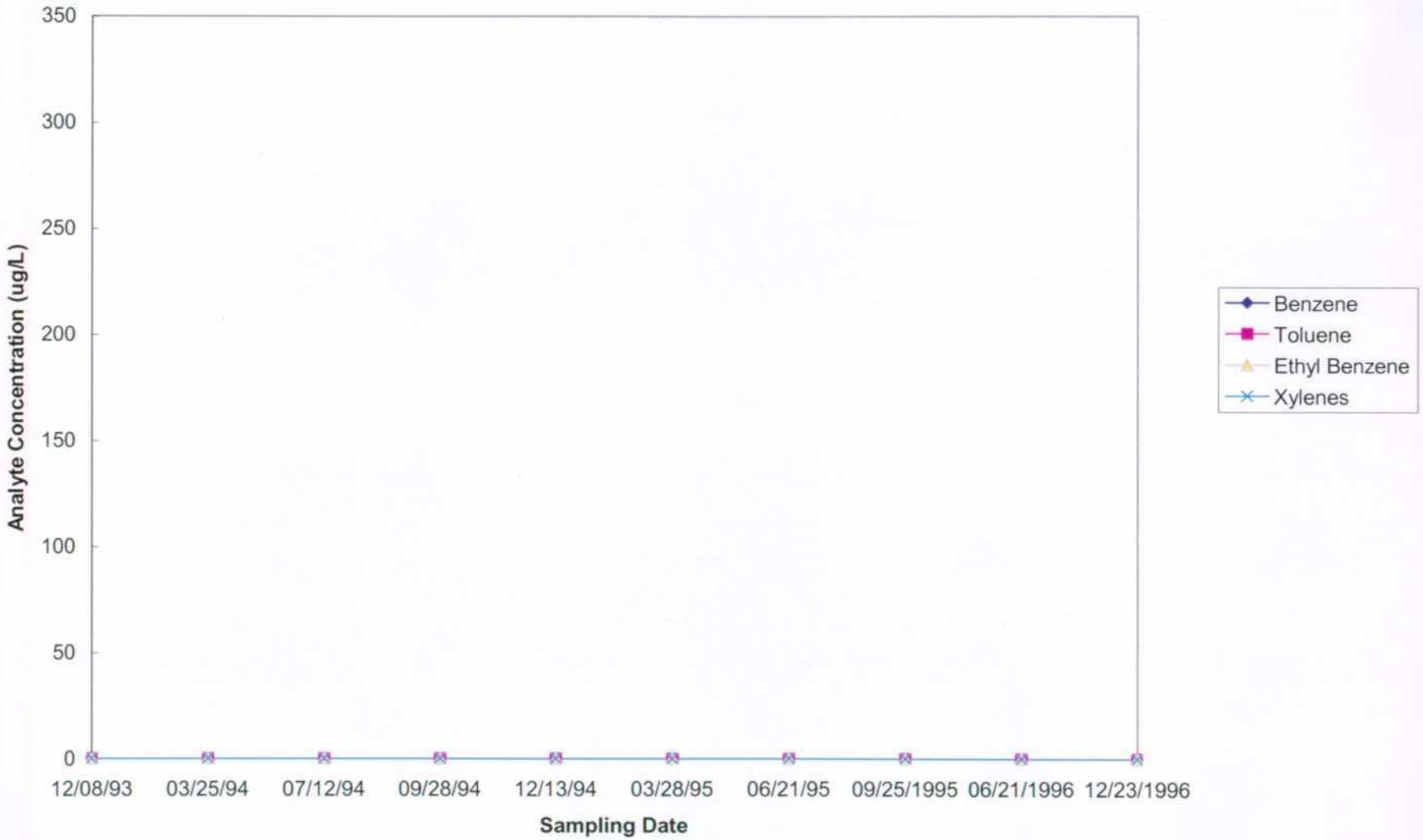


Figure 3i
Brickland Refinery
MW-15 BTEX Concentrations Over Time

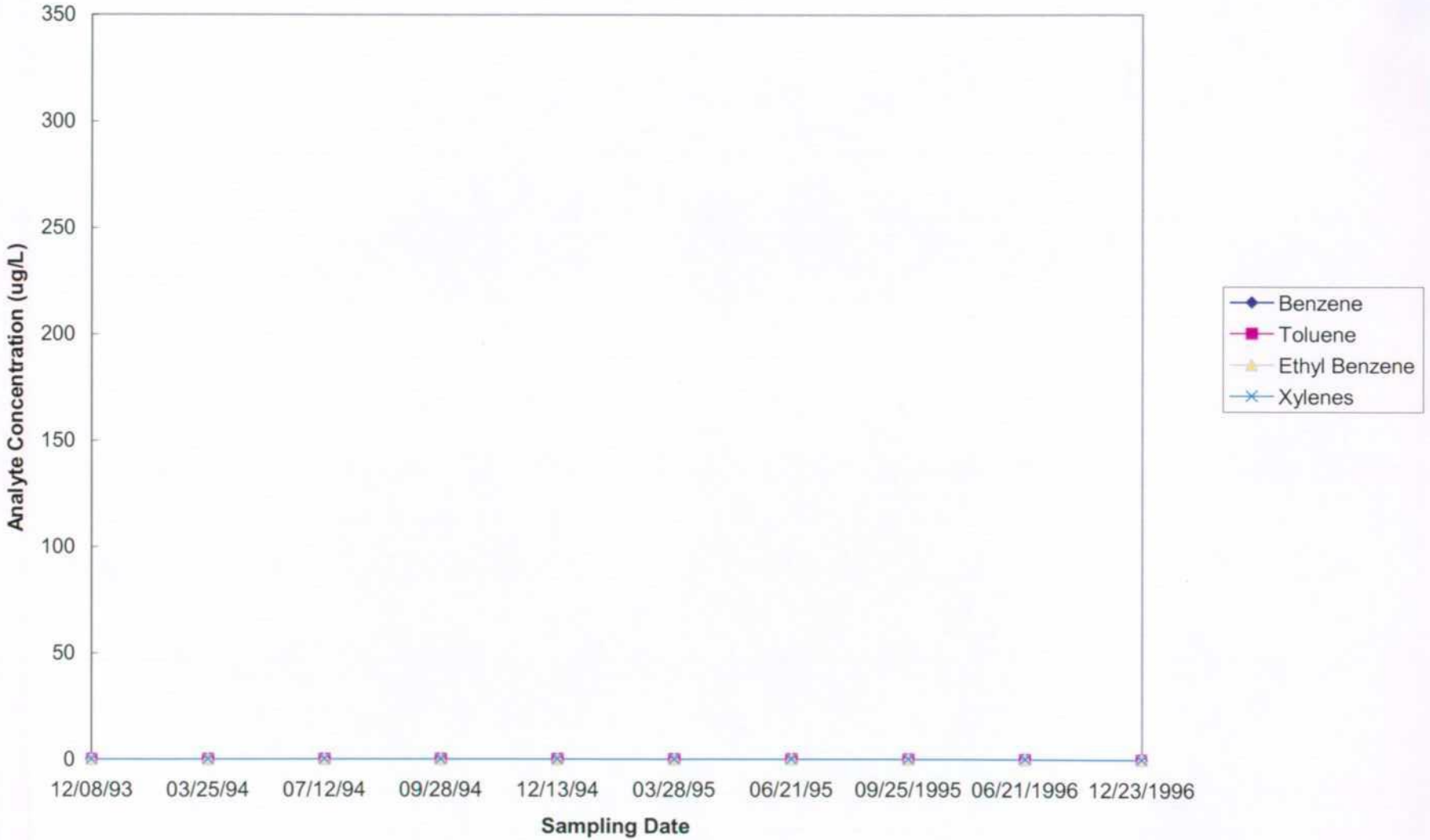


River Upstream BTEX Concentrations Over Time



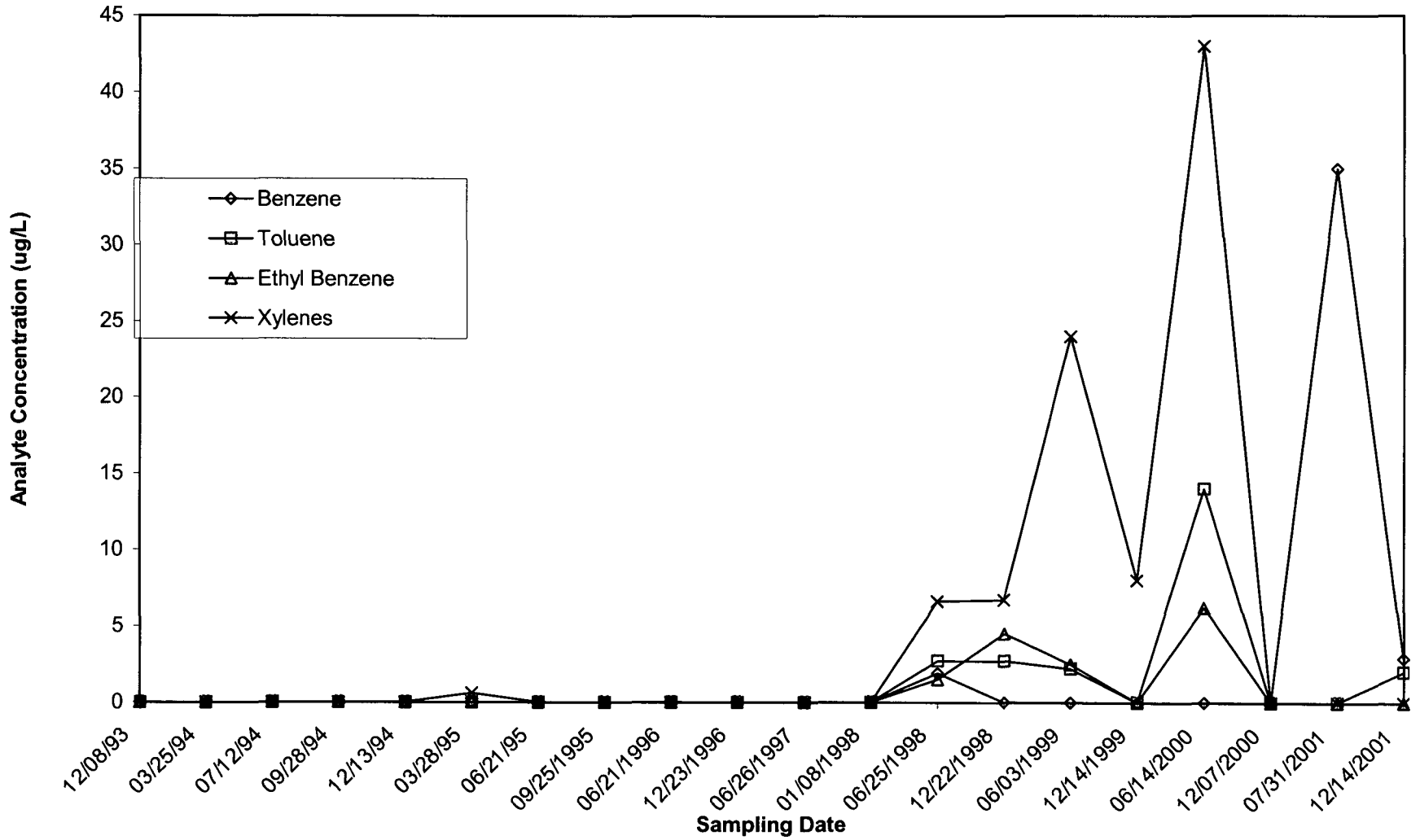
~3459907.xls (River Upstream BTEX)

River Downstream BTEX Concentrations Over Time



~3459907.xls (River Downstream BTEX)

Figure 3g
Brickland Refinery
MW-9S BTEX Concentrations Over Time



~3459907.xls (MW-9S BTEX)

Terracon

Table 4
Brickland Refinery
Total PAH Concentrations in Monitoring Wells and River Surface Water Samples
December 1993-July 2001

Well ID	12/08/1993	03/25/1994	07/12/1994	09/28/1994	12/13/1994	03/28/1995	06/21/1995
MW-3S	ND	ND	ND	ND	ND	ND	ND
MW-3D	ND	ND	ND	ND	ND	ND	ND
MW-4	NS	ND, ND	ND	ND	ND	NS	NS
MW-6S	ND	ND	ND	ND	ND	ND	15, 10
MW-6D	ND	-	ND	ND	ND	ND	ND
MW-7	NS	ND	ND	ND	ND	NS	NS
MW-9S	ND	ND	ND	ND	ND	ND	ND
MW14	*	*	670	40	ND	ND	12
MW15	**	**	117	126	84	ND	ND
Riv-Up	---	---	---	---	---	---	---
Riv-Down	---	---	---	---	---	---	---

Notes:
All Results in Micrograms per Liter (µg/L)
ND indicates constituent was not detected
NS indicates well was not sampled
--- Indicates water sample was not analyzed for polynuclear aromatic hydrocarbons (PAH).
* Well was installed 6/19/94
** Well was installed 6/21/94

Table 4 (cont.)
Brickland Refinery
Total PAH Concentrations in Monitoring Wells and River Surface Water Samples
December 1993-July 2001

Well ID	09/01/1995	06/21/1996	06/26/1997	06/25/1998	06/03/1999	06/14/2000	07/27/2001
MW-3S	ND	ND	ND	ND	ND	ND	ND
MW-3D	ND	ND	ND, ND	ND	ND	ND	ND
MW-4	NS	NS	NS	NS	NS	ND	ND
MW-6S	ND	ND	ND	ND	22, 32	ND	ND
MW-6D	ND	ND, ND	ND	ND, ND	ND	ND	ND
MW-7	NS	NS	NS	NS	NS	ND,ND	ND
MW-9S	ND	ND	ND	ND	ND	ND	ND
MW-14	ND	NS	NS	NS	NS	ND	ND,ND
MW-15	ND	NS	NS	NS	NS	ND	ND
Riv-Up		ND	ND	ND	ND	ND	ND
Riv-Down		ND	ND	ND	ND	ND	ND

Notes: All Results in Micrograms per Liter (µg/L)
ND indicates constituent was not detected
NS indicates well was not sampled
--- Indicates water sample was not analyzed for polynuclear aromatic hydrocarbons (PAH).

Terracon

Table 5
Brickland Refinery
Metal Analytical Results for Monitoring Well and River Surface Water Samples

Well ID	Sample Date	Aluminium	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Zinc
MW-3S	06/21/1996	NS	ND	0.020	NS	ND	NS	0.0021	0.023	NS	ND	NS	ND	NS	ND	NS	ND	0.050	ND	ND	ND
	06/26/1997	NS	ND	0.010	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	0.020	ND	ND	0.013
	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	06/03/1999	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	0.340
	06/14/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	07/31/2001	0.733	<0.025	<0.05	<0.100	<0.0025	0.653	<0.025	<0.01	<0.025	0.047	2.080	0.012	1.310	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	<0.025
MW-3D	06/21/1996	NS	ND	0.010	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	06/26/1997	NS	ND	0.010	NS	ND	NS	0.0019	ND	NS	ND	NS	ND	NS	ND	NS	0.007	ND	ND	ND	ND
	06/26/1997	NS	0.010	0.020	NS	ND	NS	0.0024	ND	NS	ND	NS	ND	NS	ND	NS	0.016	ND	0.009	ND	0.006
	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	0.006	ND	ND	ND	ND
	06/03/1999	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	06/14/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	08/01/2001	0.102	<0.025	<0.05	<0.100	<0.0025	0.941	<0.025	<0.01	<0.025	<0.0125	2.690	<0.01	3.600	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	<0.025
MW-4	06/14/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	08/01/2001	0.271	<0.025	<0.05	0.617	<0.0025	0.932	<0.025	<0.01	<0.025	<0.0125	3.170	0.018	4.310	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	<0.025
NMWQCC Std.		5	NA	0.1	1.0	NA	0.75	0.0100	0.050	0.050	1.0	1.0	0.05	0.20	0.0020	1.0000	0.2	0.05	0.05	NA	10.0
Reference		C	NA	A	A	NA	C	A	A	C	B	B	A	B	A	C	C	A	A	NA	B

mg/L = Milligrams per liter

Concentrations listed in **boldface** type indicate levels exceed New Mexico Water Quality Control Commission (NMWQCC) standards.

NS indicates sample was not analyzed for this constituent.

ND indicates concentration was below laboratory detection limits.

NA indicates no NMWQCC standard established.

A indicates standard is from NMWQCC Regulatory Standards Section 3103A - Human Health Standard

B indicates standard is from NMWQCC Regulatory Standards Section 3103B - Domestic Water Supply

C indicates standard is from NMWQCC Regulatory Standards Section 3103C - Irrigation Use

Terracon

Table 5 (cont)
Brickland Refinery
Metal Analytical Results for Monitoring Well and River Surface Water Samples

Well ID	Sample Date	Aluminium	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Zinc
MW-6S	06/21/1996	NS	ND	0.020	NS	ND	NS	ND	ND	NS	ND	NS	0.003	NS	ND	NS	ND	0.020	ND	ND	ND
	06/26/1997	NS	0.010	0.070	NS	ND	NS	0.0015	ND	NS	0.008	NS	ND	NS	ND	NS	ND	0.020	ND	ND	0.008
	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	06/03/1999	NS	ND, ND	ND, ND	NS	ND, ND	NS	ND, ND	ND, ND	NS	ND, ND	NS	ND, ND	NS	ND, ND	NS	ND, ND	ND, ND	ND, ND	ND, ND	ND, 0.12
	06/13/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	07/31/2001	0.604	<0.025	0.066	0.763	<0.0025	1.000	<0.025	<0.01	<0.025	0.089	5.530	0.017	1.340	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	<0.025
MW-6D	06/21/1996	NS	ND	ND	NS	0.002	NS	ND	0.031	NS	ND	NS	ND	NS	ND	NS	ND	**0.120**	**0.056**	ND	ND
	06/21/1996	NS	0.010	0.020	NS	0.003	NS	0.0044	ND	NS	ND	NS	ND	NS	ND	NS	0.008	ND	0.007	0.014	ND
	06/26/1997	NS	0.010	0.010	NS	ND	NS	0.0020	ND	NS	0.006	NS	ND	NS	ND	NS	0.025	ND	ND	ND	ND
	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	0.015	ND	ND	ND	ND
	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	0.012	ND	ND	ND	ND
	06/03/1999	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	0.053
	06/14/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	07/31/2001	<0.200	<0.025	<0.05	<0.100	<0.0025	0.807	<0.025	<0.01	<0.025	0.231	0.920	<0.017	5.360	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	<0.025
MW-7	06/13/2000	NS,NS	ND,ND	ND,ND	NS	ND,ND	NS	ND,ND	ND,ND	NS	ND,ND	NS	ND,ND	NS	ND,ND	NS	ND,ND	ND,ND	ND,ND	ND,ND	ND,ND
	07/27/2001	<0.200	<0.025	<0.05	0.211	<0.0025	0.618	<0.025	<0.01	<0.025	<0.0125	3.020	0.022	1.690	<0.0002	<0.050	<0.025	<0.05	<0.0125	<0.05	0.026
NMWQCC Std.		5	NA	0.1	1.0	NA	0.8	0.0100	0.050	0.050	1.0	1.0	0.05	0.20	0.0020	1.0000	0.2	0.05	0.05	NA	10.0
Reference		C	NA	A	A	NA	C	A	A	C	B	B	A	B	A	C	C	A	A	NA	B

mg/L = Milligrams per liter

Concentrations listed in **boldface** type indicate levels exceed New Mexico Water Quality Control Commission (NMWQCC) standards.

NS indicates sample was not analyzed for this constituent.

ND indicates concentration was below laboratory detection limits.

NA indicates no NMWQCC standard established.

A indicates standard is from NMWQCC Regulatory Standards Section 3103A - Human Health Standard

B indicates standard is from NMWQCC Regulatory Standards Section 3103B - Domestic Water Supply

C indicates standard is from NMWQCC Regulatory Standards Section 3103C - Irrigation Use

Table 5 (cont)
Brickland Refinery
Metal Analytical Results for Monitoring Well and River Surface Water Samples

Well ID	Sample Date	Aluminium	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Zinc
MW-9S	06/21/1996	NS	0.020	ND	NS	ND	NS	0.0007	ND	NS	0.044	NS	ND	NS	ND	NS	ND	**0.070**	ND	0.040	ND
	06/26/1997	NS	0.020	0.020	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	0.030	ND	ND	ND
	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	10/06/1998	NS	ND	NS	NS	NS	NS	0.001	ND	NS	0.006	NS	ND	NS	ND	NS	ND	ND	ND	NS	ND
	06/03/1999	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	06/14/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	08/01/2001	8.58	<0.025	<0.05	0.304	<0.0025	1.000	<0.025	0.080	<0.025	0.067	31.700	0.033	3.190	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	0.088
MW-14	06/13/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	08/02/2001	3.040	<0.025	<0.05	0.780	<0.0025	1.260	<0.025	<0.01	0.110	<0.0125	10.500	0.015	11.500	<0.0002	<0.050	<0.025	<0.05	<0.0125	<0.05	<0.025
MW-15	06/13/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	07/27/2001	<0.200	<0.025	<0.05	0.158	<0.0025	1.000	<0.025	<0.01	<0.025	0.020	1.860	0.012	2.100	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	<0.025
River/	06/21/1996	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	0.007	NS	ND	NS	ND	ND	ND	ND	0.013
Upstream	06/26/1997	NS	ND	ND	NS	ND	NS	ND	ND	NS	0.010	NS	ND	NS	ND	NS	ND	0.010	ND	ND	0.009
	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	06/02/1999	NS	ND	ND	NS	ND	NS	ND	ND	NS	0.280	NS	ND	NS	ND	NS	ND	ND	ND	ND	0.170
	06/13/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	08/01/2001	17.5	<0.025	<0.05	0.155	<0.0025	0.252	<0.025	<0.01	<0.025	0.019	9.790	0.011	0.416	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	0.050
River/	06/21/1996	NS	ND	ND	NS	ND	NS	ND	0.008	NS	ND	NS	0.005	NS	ND	NS	ND	ND	ND	ND	0.006
Down-	06/26/1997	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
stream	06/25/1998	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	06/02/1999	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	0.110
	06/13/2000	NS	ND	ND	NS	ND	NS	ND	ND	NS	ND	NS	ND	NS	ND	NS	ND	ND	ND	ND	ND
	08/01/2001	7.8	<0.025	<0.05	0.125	<0.0025	0.190	<0.025	<0.01	<0.025	0.019	4.710	0.012	0.261	<0.0002	<0.050	<0.025	<0.050	<0.0125	<0.050	0.050
NMWQCC Std.		5	NA	0.1	1.0	NA	0.8	0.0100	0.050	0.050	1.0	1.0	0.05	0.20	0.0020	1.0000	0.2	0.05	0.05	NA	10.0
Reference		C	NA	A	A	NA	C	A	A	Cobalt	B	B	A	B	A	C	C	A	A	NA	B

mg/L = Milligrams per liter

Concentrations listed in **boldface** type indicate levels exceed New Mexico Water Quality Control Commission (NMWQCC) standards.

NS indicates sample was not analyzed for this constituent.

ND indicates concentration was below laboratory detection limits.

NA indicates no NMWQCC standard established.

A indicates standard is from NMWQCC Regulatory Standards Section 3103A - Human Health Standard

B indicates standard is from NMWQCC Regulatory Standards Section 3103B - Domestic Water Supply

C indicates standard is from NMWQCC Regulatory Standards Section 3103C - Irrigation Use

5.0 FREE-PHASE PRODUCT AND REMEDIATION SYSTEM PERFORMANCE

5.1 Free-Phase Product Thickness

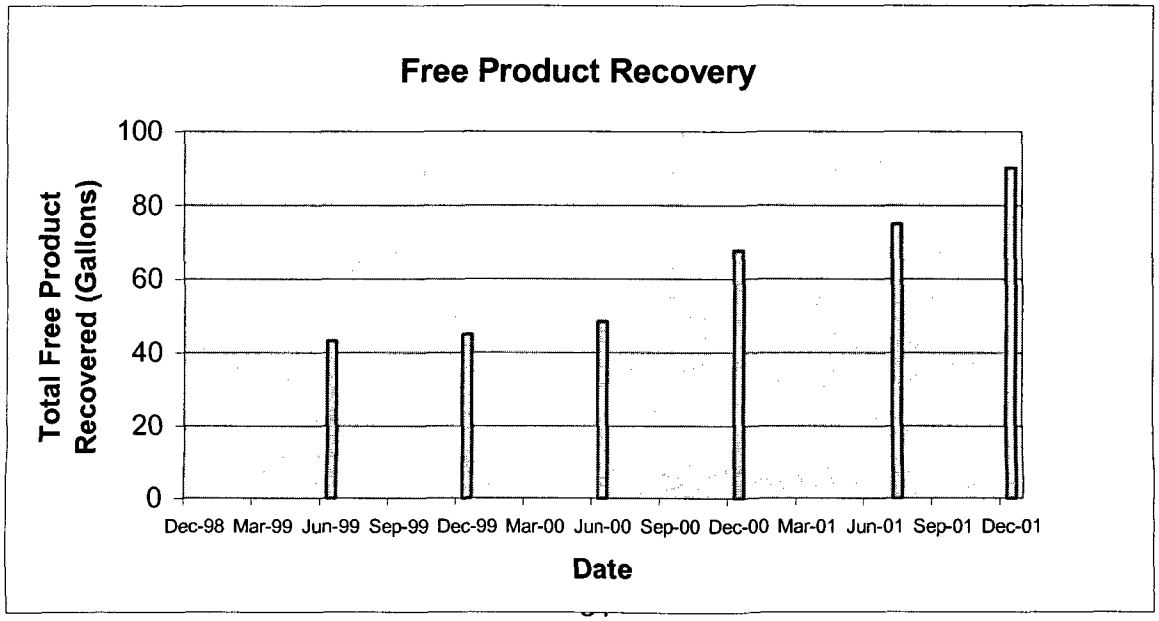
- Free-phase product thickness in each monitoring well and well point was measured with a KECK oil/water interface meter. The year 2001 and historical product thickness measurements for each monitoring point are listed in Table 6. Free-Phase Hydrocarbon Thickness maps for the July 2001 and December 2001 monitoring events are depicted in Figures 4a and 4b, respectively. Monitoring points with measurable thicknesses of free-phase product during the July 2001 and December 2001 monitoring events are summarized below. This is the first year that recovery well MW-10 has not contained any measurable accumulation of free-phase product during both sampling events.

Free-Phase Product Thickness		
Well ID	**7/27/01, 8/2/01**	**12/13/01, 12/14/01**
WP-26S	1.91	1.45
WP-27D	0.00	0.44

Both well point (WP) measurements are consistent with prior assessments.

5.2 Removal and Off-Site Destruction of Free-Phase Product and Contaminated Groundwater

As of December 13, 2001, a total of approximately 90 gallons of free-phase product had been removed from recovery well MW-10 (see chart below). About one-fourth, or 22.4 gallons, was removed during the year 2001.



Additionally, a total of 305 gallons and 291 gallons of water were purged from the sampled monitoring wells during the July 2001 and December 2001 monitoring events, respectively. Terracon coordinated and subcontracted with Rhino Environmental Services, Inc. (Rhino) for the off-site destruction of the contaminated groundwater. The purged groundwater of each monitoring event was stored in a 325-gallon polyethylene tank by Terracon field personnel. The tank was transported from the site to Rhino for off-site destruction of the contaminated groundwater. Rapid Recovery, Inc. of El Paso was contracted to transport and dispose of the free-phase product from recovery well MW-10. At the time of this report, the free-phase product tank was less than one-half full, therefore off-site destruction has not been initiated.

5.3 Remediation System

Due to the continued presence of free-phase product, concentrated near the south portion of the site, a product recovery system was installed at recovery well MW-10 as recommended in the approved Stage 2 Abatement Plan. Installation of the Xitech product recovery system was completed on December 23, 1998. The product recovery system consists of the following components:

1. Xitech Model ADJ 1000 Smart Skimmer with polyethylene tubing
2. Xitech Model 2500 ES Electronic Timer powered by a 12-volt battery with solar panel
3. 80-gallon fiberglass-reinforced plastic (FRP) tank for product recovery containment with automatic shutoff sensor
4. One K-size (220 cubic feet) bottle of nitrogen gas with regulator to supply
5. The components listed above are mounted on a metal stand
6. The components listed above are contained within a 300-gallon capacity corrugated galvanized steel stock tank for secondary containment
7. The Xitech recovery system and monitoring well MW-10 are enclosed within a 10-foot long by 10-foot wide by 8-foot tall chainlink fence. The top foot of the fence has 3 strands of barbed wire. Access is provided through a 5-foot wide locked gate.
8. The components listed above are situated on a 6-inch layer of gravel.

A schematic drawing and specifications of the installed Xitech product recovery system is provided in Appendix C. The system does not contain any below-grade lines; therefore no pressurized integrity testing is required. Site visits are conducted at approximately bi-weekly intervals to monitor system performance, adjust pump cycle if deemed appropriate, replace the bottled nitrogen supply when necessary, perform maintenance to system components, and to check for any vandalism. Due to recurring problems with the pump control mechanism, the control box (pump timer) was pulled and sent back to the manufacturer, Xitech, Inc. in December 2001 for upgrading. The control box has since been reinstalled and is working efficiently. Currently, the timer is set to turn the pump on once per day for three minutes.

Terracon

Table 6
Brickland Refinery
Free-Phase Hydrocarbon Thickness Measurements (feet)

Well ID	Sept. 93	Dec. 93	Mar. 94	Jul. 94	Sept. 94	Dec. 94	Mar. 95	Dec. 95	Jun. 96	Dec. 96	Jul. 97	Jan. 98	Jun. 98	Dec. 98	Jun. 99	Dec. 99	Jun. 00	Dec. 00	Jul. 01	Dec. 01
MW-1	NM	NM	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-2	NM	NM	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	A	A	A	A	A
MW-3S	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-3D	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-4	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-5	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-6S	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-6D	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-7	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-8	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-9S	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-10	5.42	3.58	NM	3.45	2.40	2.46	NM	2.29	2.3	2.14	2.01	2.26	2.21	2.50	0.14	0.00	0.03	0.06	0.00	0.00
MW-11	NM	NM	0.00	0.00	0.05	NM	NM	0.16	0	<0.01	<0.01	<0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-12	NM	NM	0.00	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-13	NM	NM	NM	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	A	A	A	A	A
MW-14	NM	NM	NM	0.00	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-15	NM	NM	NM	0.00	0.00	0.00	0.00	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-16	NM	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Dry	0.00	0.00	0.00	0.00	0.00
MW-17	NM	NM	NM	0.00	0.00	0.00	0.00	0.00	NM	0.00	0.00	Dry	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00

Notes:

NM = Monitoring point was not measured

Dry = Monitoring point was dry

A = Monitoring well abandoned under supervision of then Terracon employee Mr. Gregory J. Contaldo, C.P.G., NMED Certified Scientist #109, in June 1999 prior to soil cap installation

Terracon

Table 6 (cont)
Brickland Refinery
Free-Phase Hydrocarbon Thickness Measurements (feet)

Well ID	Sept. 93	Dec. 93	Mar. 94	Jul. 94	Sept. 94	Dec. 94	Mar. 95	Dec. 95	Jun. 96	Dec. 96	Jul. 97	Jan. 98	Jun. 98	Dec. 98	Jun. 99	Dec. 99	Jun. 00	Dec. 00	Jul. 01	Dec. 01
WP-1	NM	NM	NM	0.00	0.00	0.00	NM	0.16	NM	<0.01	0.00	Dry	0.00	0.74	0.01	0.00	0.00	0.00	0.00	0.00
WP-2	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-3	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-4	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-5	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-6	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	<0.01	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-7	NM	NM	NM	0.00	0.00	0.00	NM	NM	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-8	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-9	0.01	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-10	NM	NM	NM	0.00	0.20	Dry	NM	0.00	NM	Dry	0.00	Dry	0.00	Dry	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-11	0.01	NM	NM	0.00	Dry	Dry	NM	NM	NM	Dry	0.00	Dry	0.00	Dry	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-12	NM	NM	NM	0.00	Dry	NM	NM	0.00	NM	Dry	0.00	Dry	0.00	Dry	Dry	Plugged	Plugged	Plugged	Plugged	Plugged
WP-13	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	Dry	0.00	Dry	0.00	Dry	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-14	NM	NM	NM	0.00	Tar	NM	NM	0.14	NM	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Tar	Tar
WP-15	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.20	Dry	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-16	NM	NM	NM	0.00	NM	NM	NM	0.00	NM	Dry	Dry	Dry	0.00	Dry	Dry	Plugged	Plugged	Plugged	Plugged	Plugged
WP-17	NM	NM	NM	0.00	Dry	Dry	NM	0.00	NM	Dry	0.12	Dry	0.00	Dry	Dry	Plugged	Plugged	Plugged	Plugged	Plugged
WP-18	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	<0.01	<0.01	Dry	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-19	NM	0.01	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-20	NM	NM	NM	0.00	NM	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged

Notes:

NM = Monitoring point was not measured

Dry = Monitoring point was dry

Tar = Thickness measurement not obtainable because of presence of thick tar-like substance in well point.

Plugged = Monitoring point removed and hole plugged with bentonite in June 1999

Terracon

Table 6 (cont)
Brickland Refinery
Free-Phase Hydrocarbon Thickness Measurements (feet)

Well ID	Sept. 93	Dec. 93	Mar. 94	Jul. 94	Sept. 94	Dec. 94	Mar. 95	Dec. 95	Jun. 96	Dec. 96	Jul. 97	Jan. 98	Jun. 98	Dec. 98	Jun. 99	Dec. 99	Jun. 00	Dec. 00	Jul. 01	Dec. 01
WP-21	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	Dry	0.06	Dry	0.00	Dry	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-22	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	NM	NM	NM	0.00	NM	NM	Plugged	Plugged	Plugged	Plugged	Plugged
WP-23	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	NM	NM	NM	0.00	NM	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-24	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-25	0.05	0.05	NM	0.22	NM	0.20	NM	1.56	NM	NM	NM	<0.01	0.00	1.05	0.70	Dry	Dry	Dry	Dry	Dry
WP-26S	NM	0.12	NM	2.20	2.59	1.53	NM	0.00	NM	0.00	1.29	Tar	0.00	0.39	1.82	1.55	1.70	1.19	1.91	1.45
WP-26D	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-27S	NM	NM	NM	0.00	0.00	0.00	NM	NM	NM	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
WP-27D	NM	NM	NM	0.11	0.45	0.49	NM	NM	NM	0.48	0.44	1.18	0.00	0.00	0.13	0.35	0.29	0.45	0.00	0.44
WP-28	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	Dry	0.00	Dry	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-29	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	<0.01	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-30	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-31	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
WP-32	NM	NM	NM	Dry	Dry	Dry	NM	Dry	NM	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
WP-33	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	<0.01	<0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WP-34	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-35	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-36	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.00	0.00	0.00	0.00	Dry	0.00	Plugged	Plugged	Plugged	Plugged	Plugged
WP-37	NM	NM	NM	0.00	0.00	0.00	NM	0.00	NM	0.04	0.17	0.00	0.00	0.00	0.00	Plugged	Plugged	Plugged	Plugged	Plugged

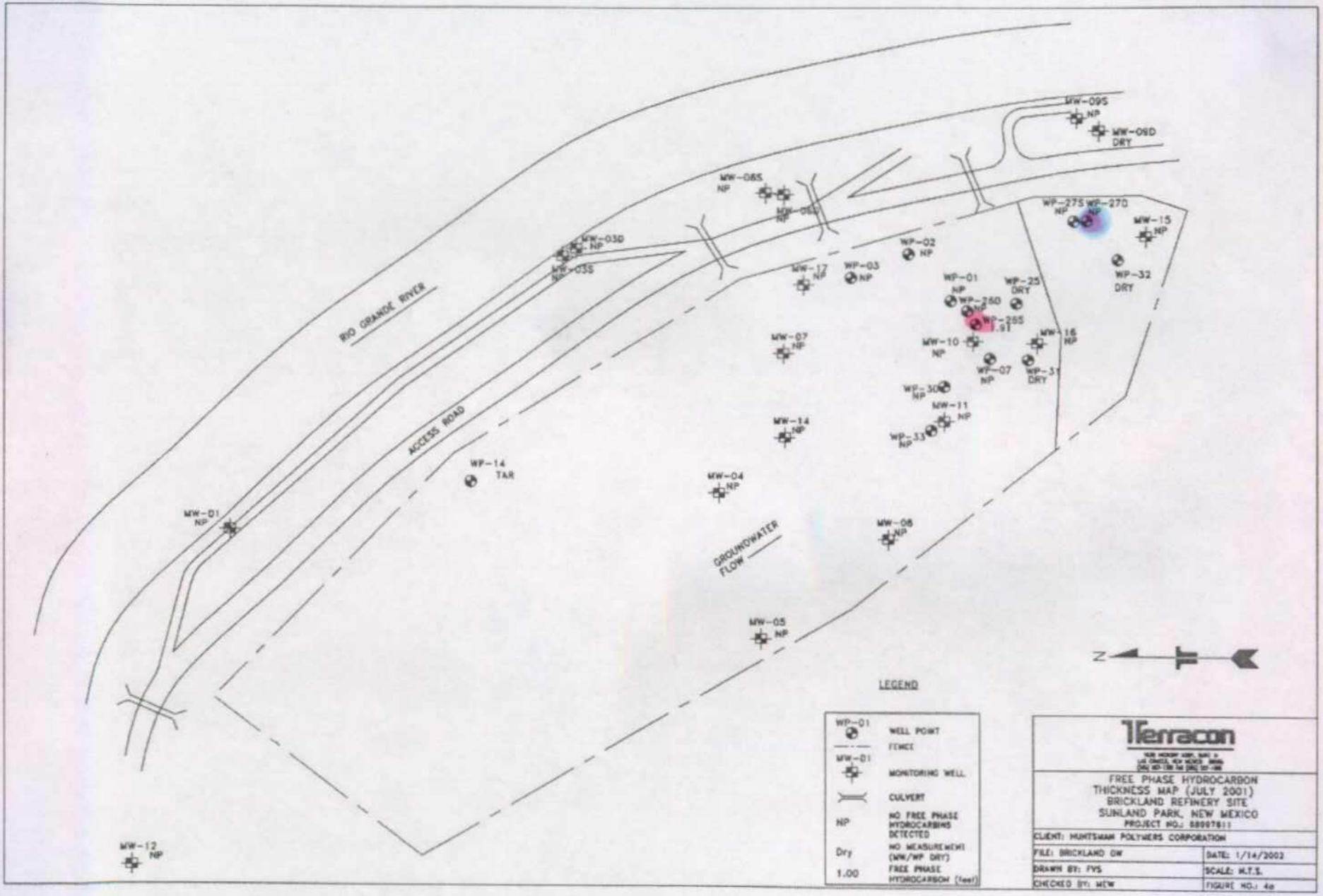
Notes:

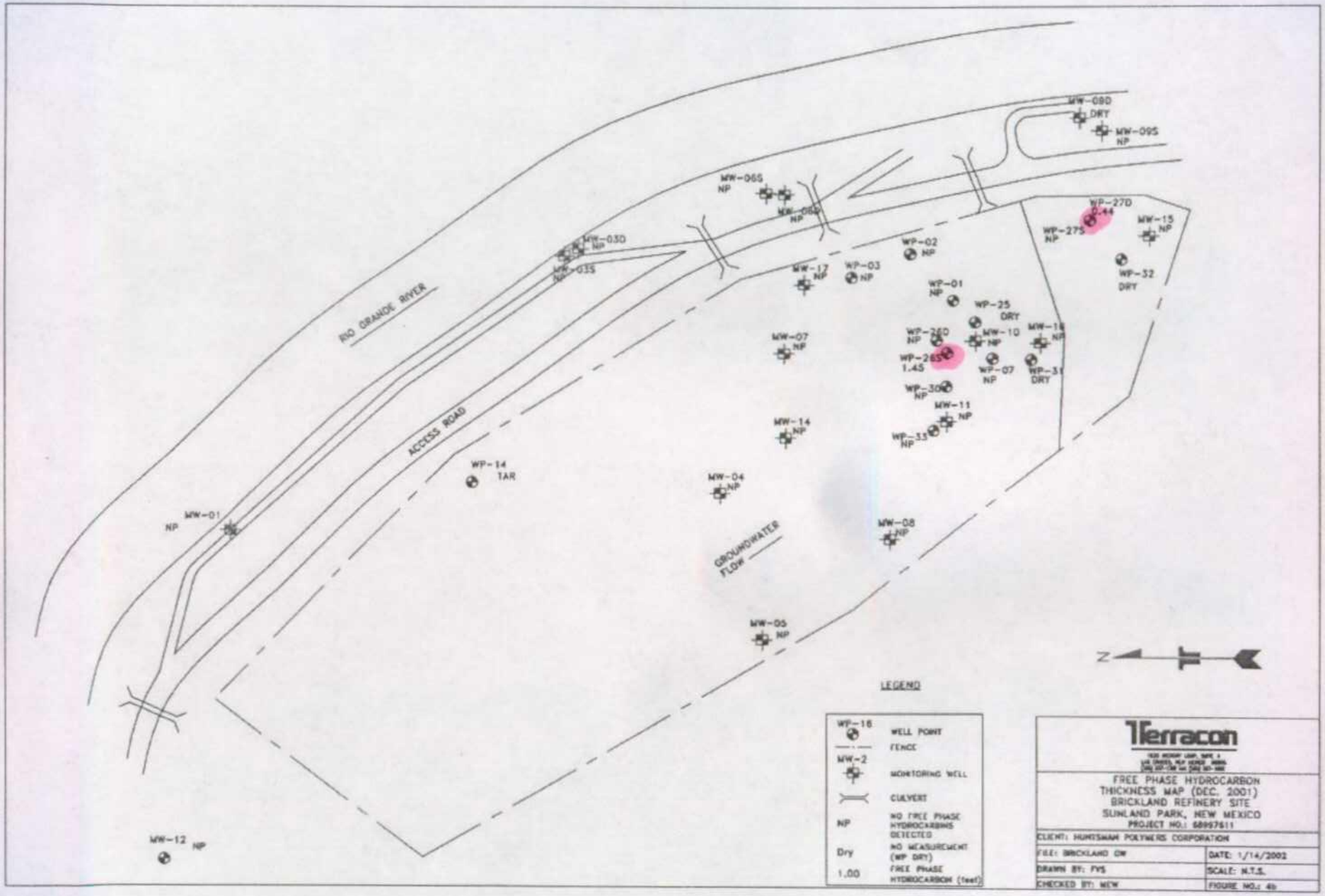
NM = Monitoring point was not measured (Note: WP-22 was damaged and unmeasureable in June 1999)

Dry = Monitoring point was dry

Tar = Thickness measurement not obtainable because of presence of thick tar-like substance in well point.

Plugged = Monitoring point removed and hole plugged with bentonite in June 1999


MW-09S
NP
MW-09D
DRY
MW-08S
NP
MW-08D
NP
WP-27S
NP
WP-27D
NP
MW-15
NP
MW-03D
NP
MW-03S
NP
WP-02
NP
MW-17
NP
WP-03
NP
WP-01
NP
WP-25
DRY
WP-32
DRY
WP-26D
NP
WP-26S
1.91
MW-16
NP
MW-10
NP
MW-07
NP
WP-07
NP
WP-31
DRY
WP-30
NP
MW-11
NP
MW-14
NP
WP-33
NP
WP-14
TAR
MW-04
NP
MW-01
NP
MW-06
NP
RIO GRANDE RIVER
ACCESS ROAD
GROUNDWATER FLOW
MW-05
NP
MW-12
NP
N
LEGEND
WP-01 WELL POINT
FENCE
MW-01 MONITORING WELL
CULVERT
NP NO FREE PHASE HYDROCARBONS DETECTED
Dry NO MEASUREMENT (MW/WP DRY)
1.00 FREE PHASE HYDROCARBON (feet)
Terracon
FREE PHASE HYDROCARBON THICKNESS MAP (JULY 2001)
BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
PROJECT NO.: 88997811
CLIENT: HUNTSMAN POLYMERS CORPORATION
FILE: BRICKLAND GW
DATE: 1/14/2002
DRAWN BY: FVS
SCALE: N.T.S.
CHECKED BY: MEW
FIGURE NO.: 4a


MW-09D
DRY
MW-09S
NP
MW-06S
NP
MW-06D
NP
MW-03D
NP
MW-03S
NP
WP-27D
0.44
WP-27S
NP
MW-15
NP
WP-02
NP
WP-32
DRY
MW-17
NP
WP-03
NP
WP-01
NP
WP-25
DRY
WP-26D
NP
MW-10
NP
MW-18
NP
MW-07
NP
WP-26S
1.45
WP-07
NP
WP-31
DRY
WP-30
NP
MW-11
NP
MW-14
NP
WP-33
NP
WP-14
TAR
MW-04
NP
MW-01
NP
MW-08
NP
RIO GRANDE RIVER
ACCESS ROAD
GROUNDWATER FLOW
MW-05
NP
MW-12
NP
N
LEGEND
WP-16
WELL POINT
FENCE
MW-2
MONITORING WELL
CULVERT
NP
NO FREE PHASE HYDROCARBONS DETECTED
Dry
NO MEASUREMENT (WP DRY)
1.00
FREE PHASE HYDROCARBON (feet)
Terracon
FREE PHASE HYDROCARBON THICKNESS MAP (DEC. 2001)
BRICKLAND REFINERY SITE
SUNLAND PARK, NEW MEXICO
PROJECT NO.: 68997611
CLIENT: HUNTSMAN POLYMERS CORPORATION
FILE: BRICKLAND DW
DATE: 1/14/2002
DRAWN BY: FVS
SCALE: N.T.S.
CHECKED BY: MEW
FIGURE NO.: 4b

6.0 CONCLUSIONS

Conclusions relevant to groundwater conditions and the remediation performance at the Brickland Refinery are presented below.

- Results of the July sampling event indicate that benzene concentrations exceeded New Mexico Water Quality Control Commission (NMWQCC) standards in three monitoring wells; MW-4 (196 g/L), MW-6S (12 g/L), and MW-9S (35 g/L). Benzene concentrations in the remaining six wells were either below laboratory detection levels or NMWQCC standards. Toluene and ethylbenzene were also detected in samples from three wells and the river, but the concentrations were significantly below NMWQCC Standards (see Table 3). The results from monitoring wells MW-4 and MW-6S are either similar to or lower than previous results. Only the concentration in well MW-9S was higher than prior concentrations and NMWQCC standards.

- Results of the December sampling event indicate that benzene concentrations in MW-4 (54.6 g/L) exceeded NMWQCC standards. Benzene was also detected in three other wells, but was below NMWQCC standards. Toluene was detected in wells MW-4 and MW-9S in trace amounts; 1.8 g/L and 2 g/L, respectively. No other parameter was detected in the samples with the exception of xylene that was detected at a concentration of 1.9 g/L in well MW-9S. Benzene concentrations were lower than results from previous years (see Table 3).

- PAH levels were below laboratory detection limits in all monitoring wells sampled (see Table 4) for both sampling events. During the July sampling event, the duplicate sample collected from MW-14 for PAH analysis was broken on its way to the laboratory and another sample had to be collected. The replacement sample showed a naphthalene concentration of 0.034mg/L, which was believed to be the result of laboratory contamination. Other than that replacement sample for duplicate MW-14, the results of this semi-annual monitoring event appear to be consistent with previous years' results.

- Seven metals (aluminum, barium, boron, cobalt, iron, manganese, and molybdenum) were added to the list of priority pollutant metals for the July sampling event. This increased the list to a total of twenty priority pollutant metals. The results for the analyses of the priority pollutant metals for the July 2001 monitoring event indicate that levels of five of the seven metals added to the list exceeded the NMWQCC levels. Iron and manganese concentrations exceeded NMWQCC standards in water samples collected from the river (which also exhibited aluminum concentrations above NMWQCC standards, both upstream and downstream), and groundwater samples collected from all wells

except MW-6D. Additionally, aluminum, boron, and chromium levels exceeded NMWQCC standards in monitoring well MW-9S; and boron levels exceeded NMWQCC standards in monitoring wells MW-3D, MW-4, MW-6S, MW-6D, MW-14, and MW-15. Minor concentrations of the other listed metals were detected, but were below NMWQCC standards. None of the original thirteen metals has exceeded the NMWQCC standards since 1996 (see Table 5).

- Most metals results remained consistent with prior years results. Aluminum concentrations were above NMWQCC standards for the upstream and downstream river samples, and the sample from monitor well MW-9S. Since the upstream and downstream river samples were above regulatory standards, this is an indication that the site is not contributing to the concentration in the Rio Grande.

- Lead was found in the shallow perimeter wells, the on-site wells, and both the upstream and downstream river samples. This marks the first time that lead has been detected in the wells and the river since 1996. However, the lead concentrations were all below the NMWQCC standard.

- Free-phase product was not detected in any monitoring well during the July 2001 monitoring event. However, one well point (WP-26S) had a free-phase product thickness of 1.91 feet. Product thickness was measurable in two well points, WP-26S (1.45 feet) and WP-27D (0.44 foot), during the December 2001 monitoring event (see Table 6).

- Since the installation of the Xitech product recovery system in December 1998, a total of approximately 90 gallons of free-phase product and water have been removed from recovery well MW-10.

- The variance in water level elevations between July and December correlates with prior years.

7.0 RECOMMENDATIONS

The following recommendations are proposed for the remediation system and monitoring operations at the Brickland Refinery.

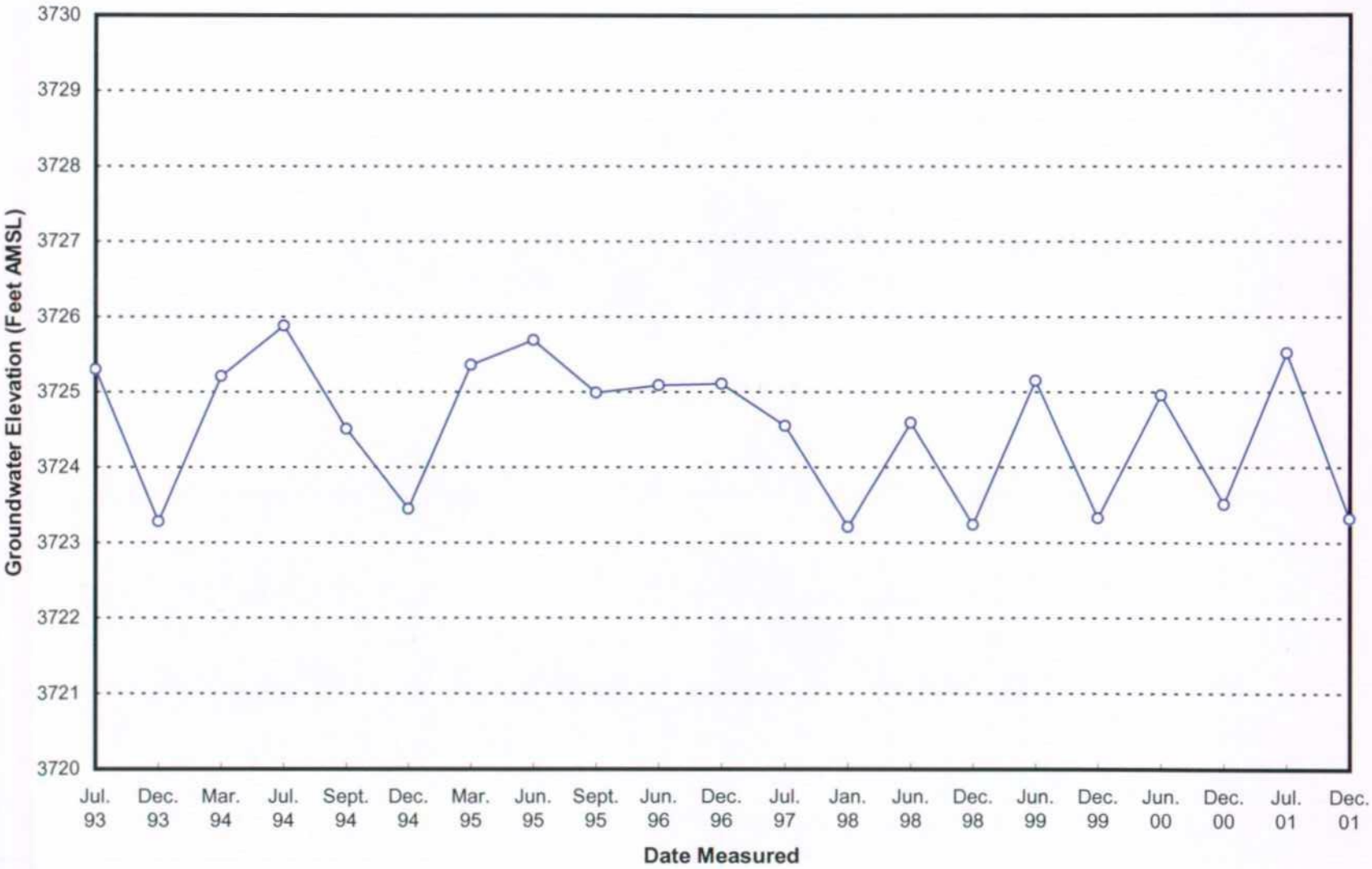
- Continue free product recovery operations since the present system has been effective in recovering free product from MW-10.

- Continue with the existing sampling and monitoring program on a semi-annual basis. The next sampling event is scheduled for June 2002. Check recovery well, MW-10 for at least one more year to assess if free-phase product is present.

- Since the groundwater does not appear to be adversely impacted by PAH, as evidenced throughout eight years of monitoring, analysis of PAH may be an unnecessary expense.

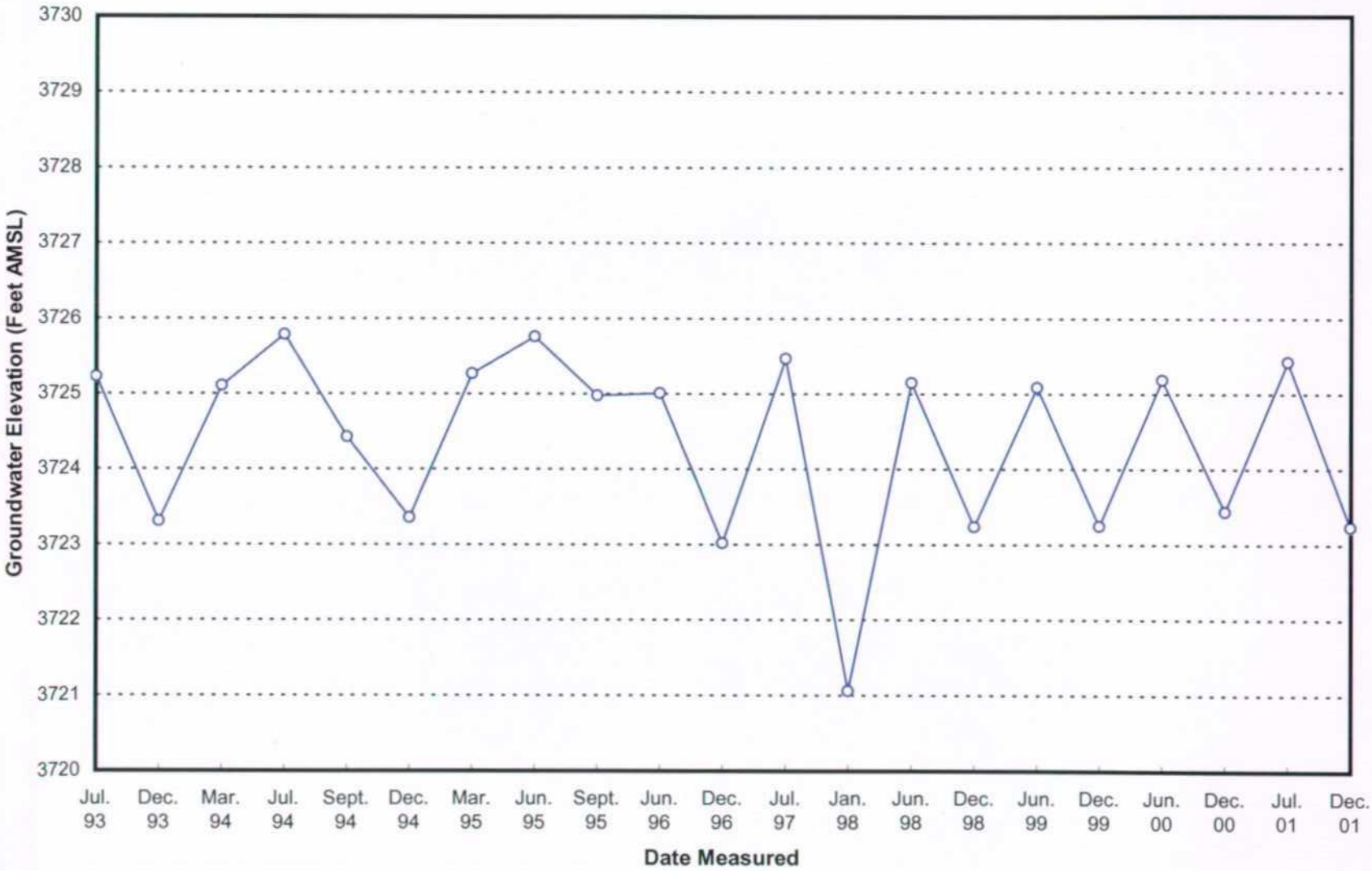
- Well points that are dry or have never contained measurable or trace amounts of free-phase product could be removed from the monitoring plan. These well points include the following: WP-2, WP-3, WP-7, WP-26D, WP-30, WP-31, and WP-32. The other well points should be maintained for semi-annual monitoring.

Brickland Refinery
MW-3S Groundwater Elevation Over Time



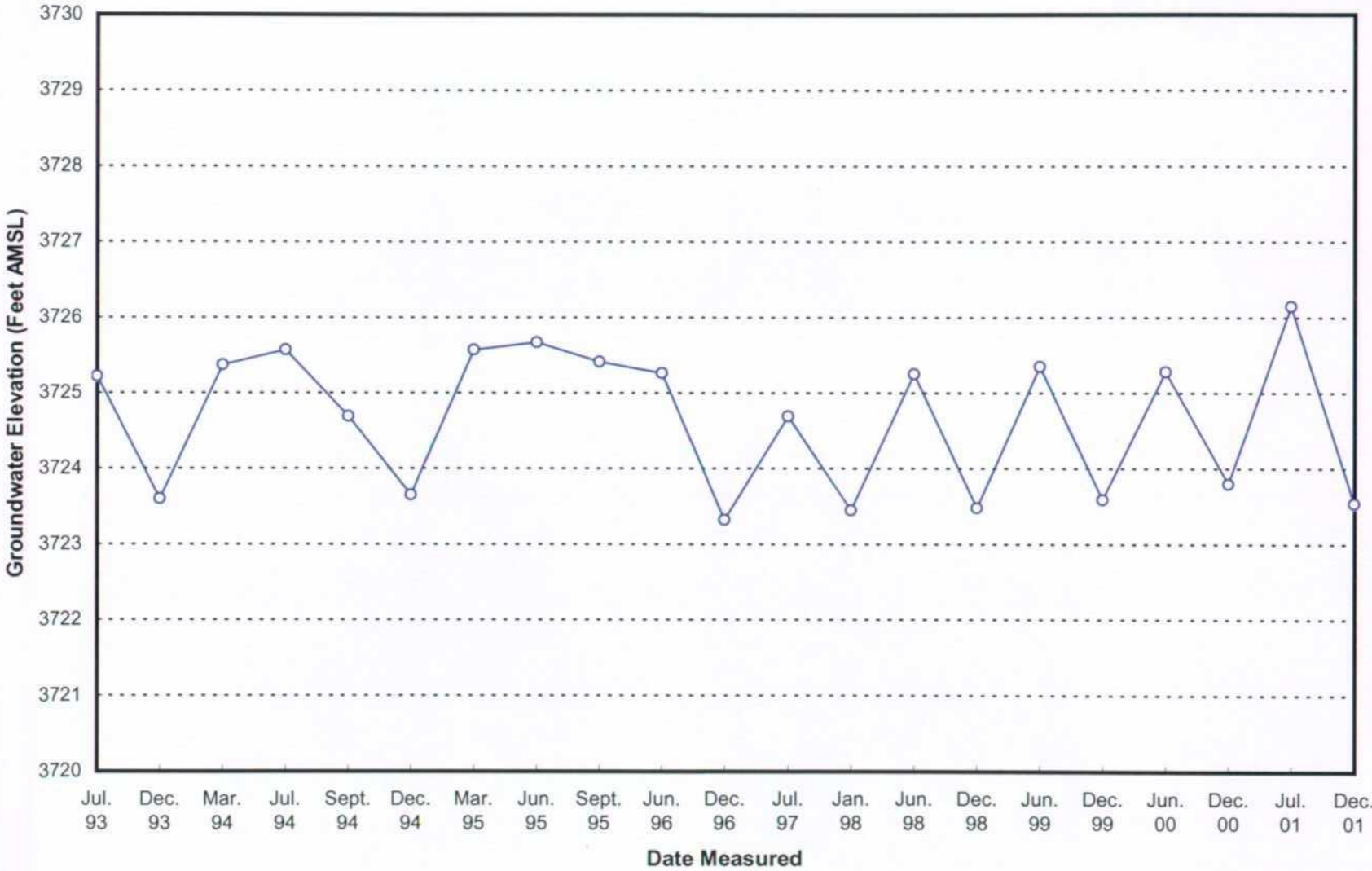
~3459907.xls:MW-3S WL

Brickland Refinery
MW-3D Groundwater Elevation Over Time



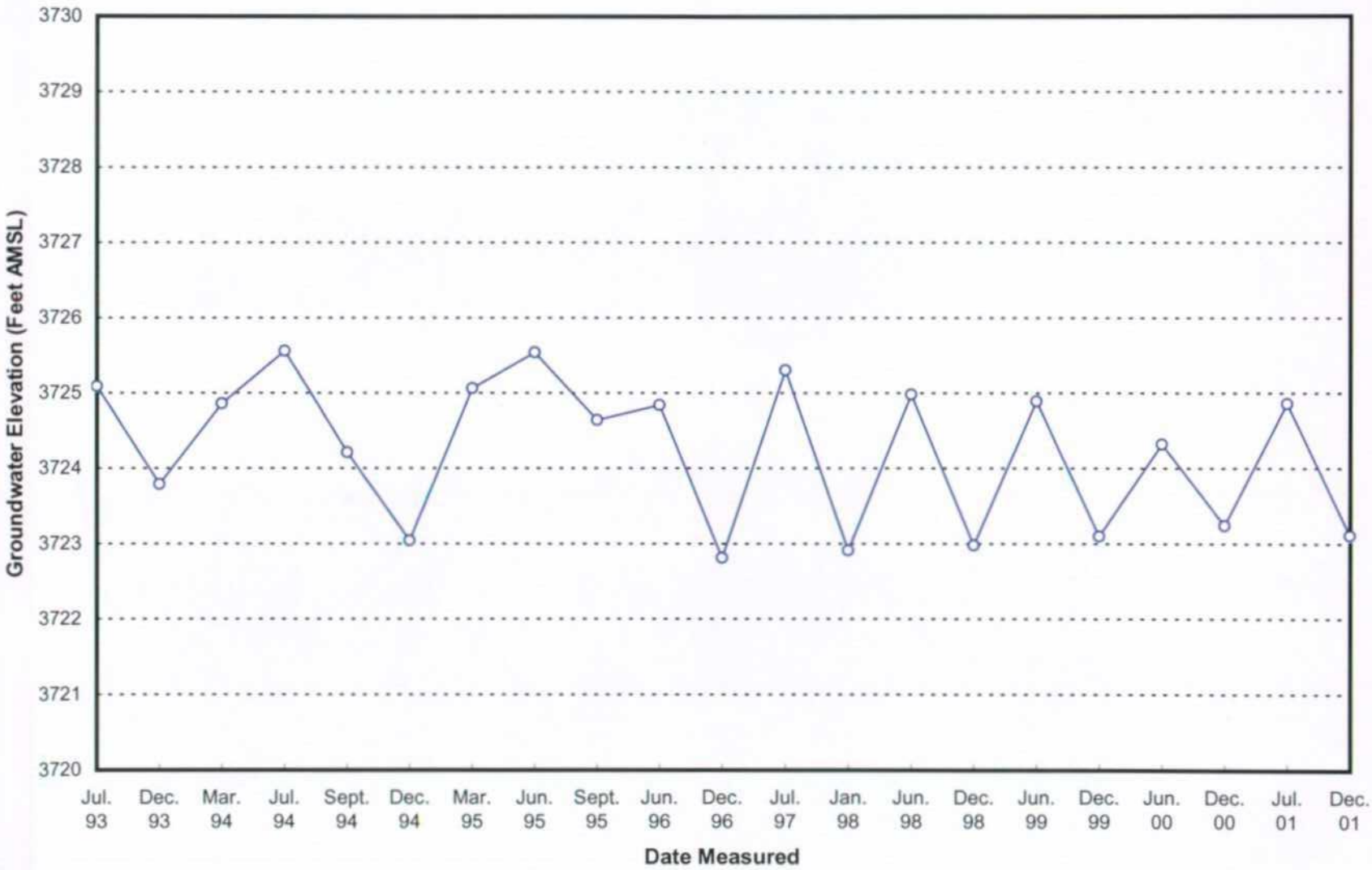
~3459907.xls:MW-3D WL

Brickland Refinery
MW-4 Groundwater Elevation Over Time



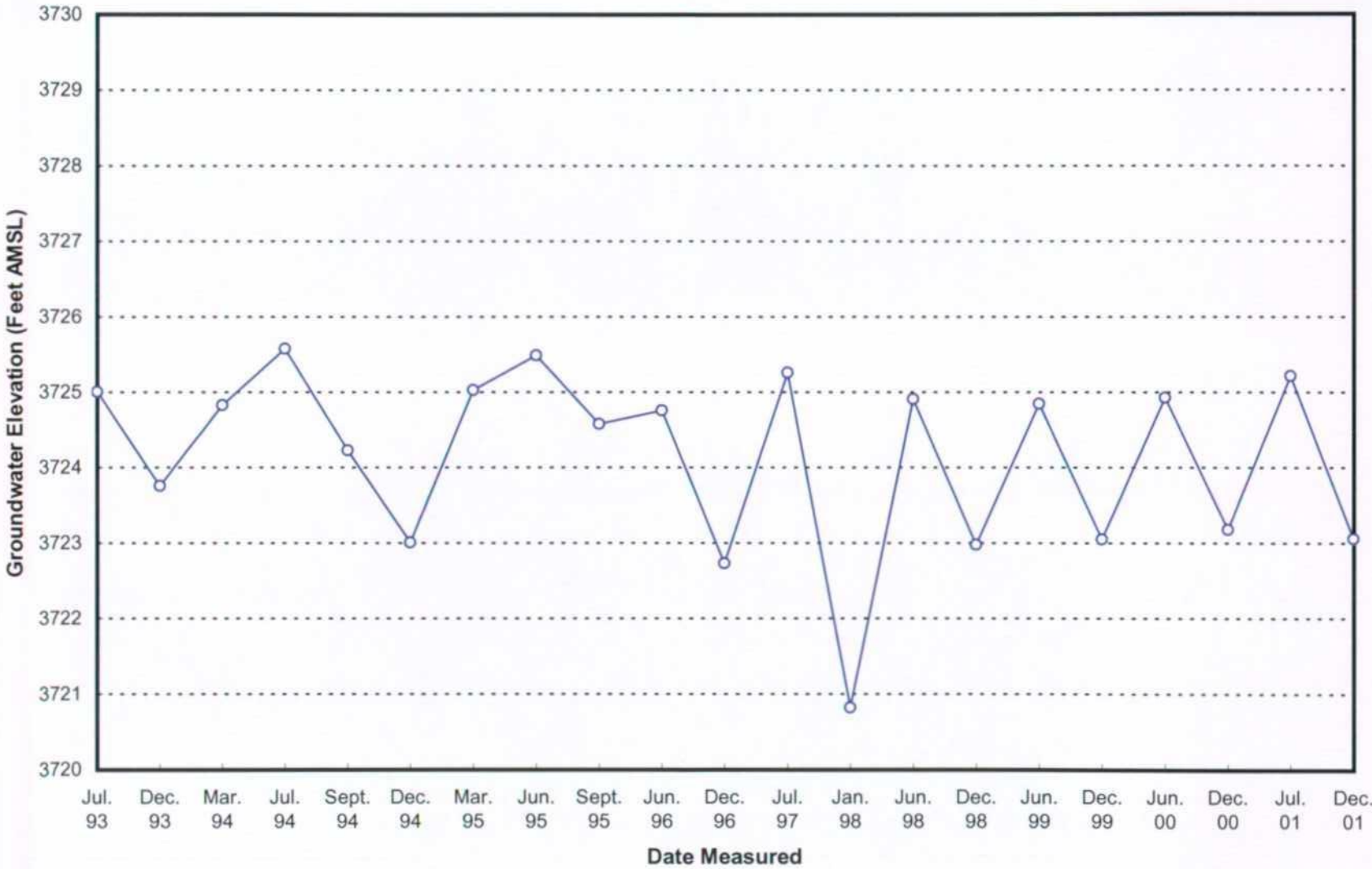
~3459907.xls:MW-4 WL

Brickland Refinery
MW-6S Groundwater Elevation Over Time



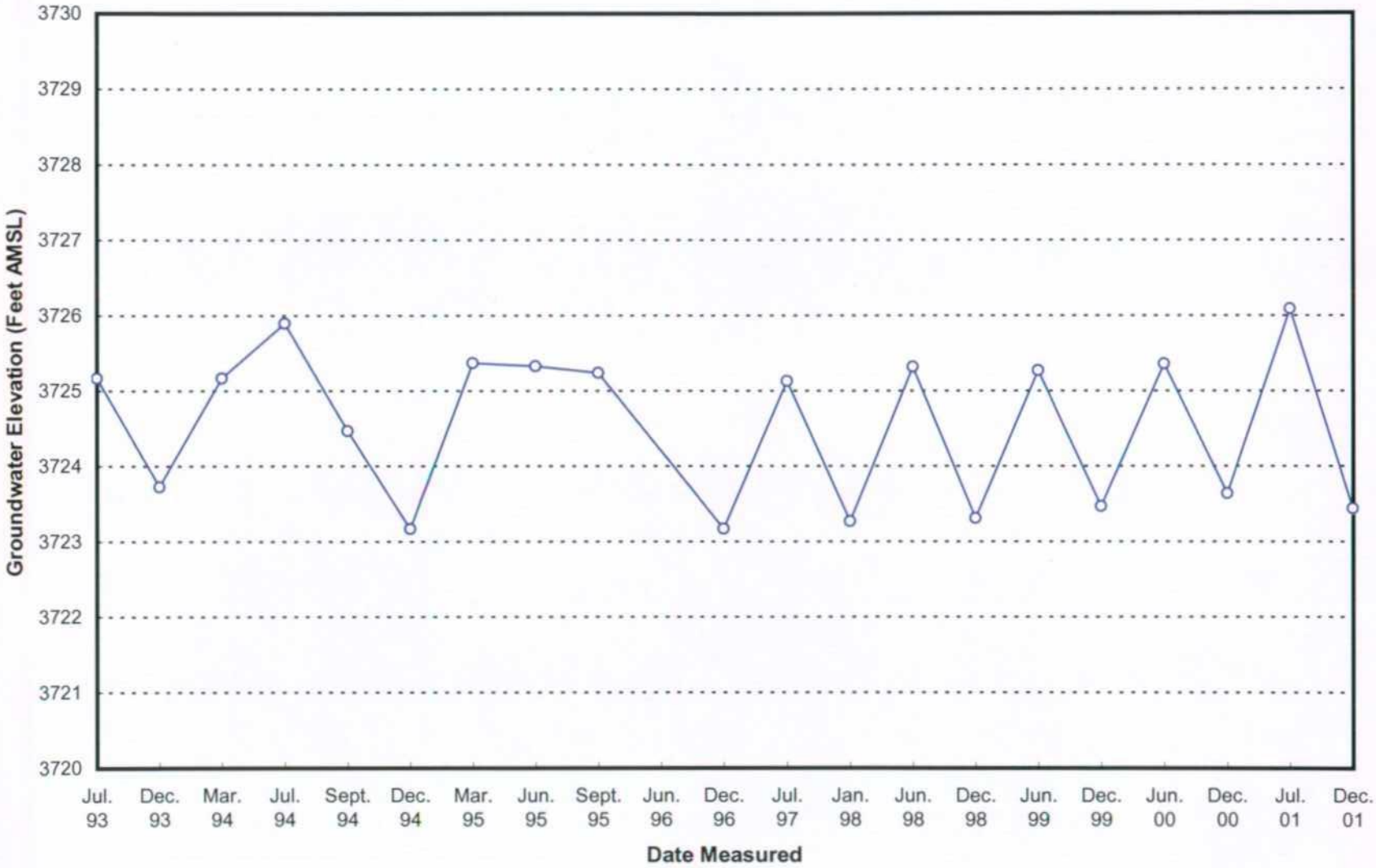
~3459907.xls:MW-6S WL

Brickland Refinery
MW-6D Groundwater Elevation Over Time



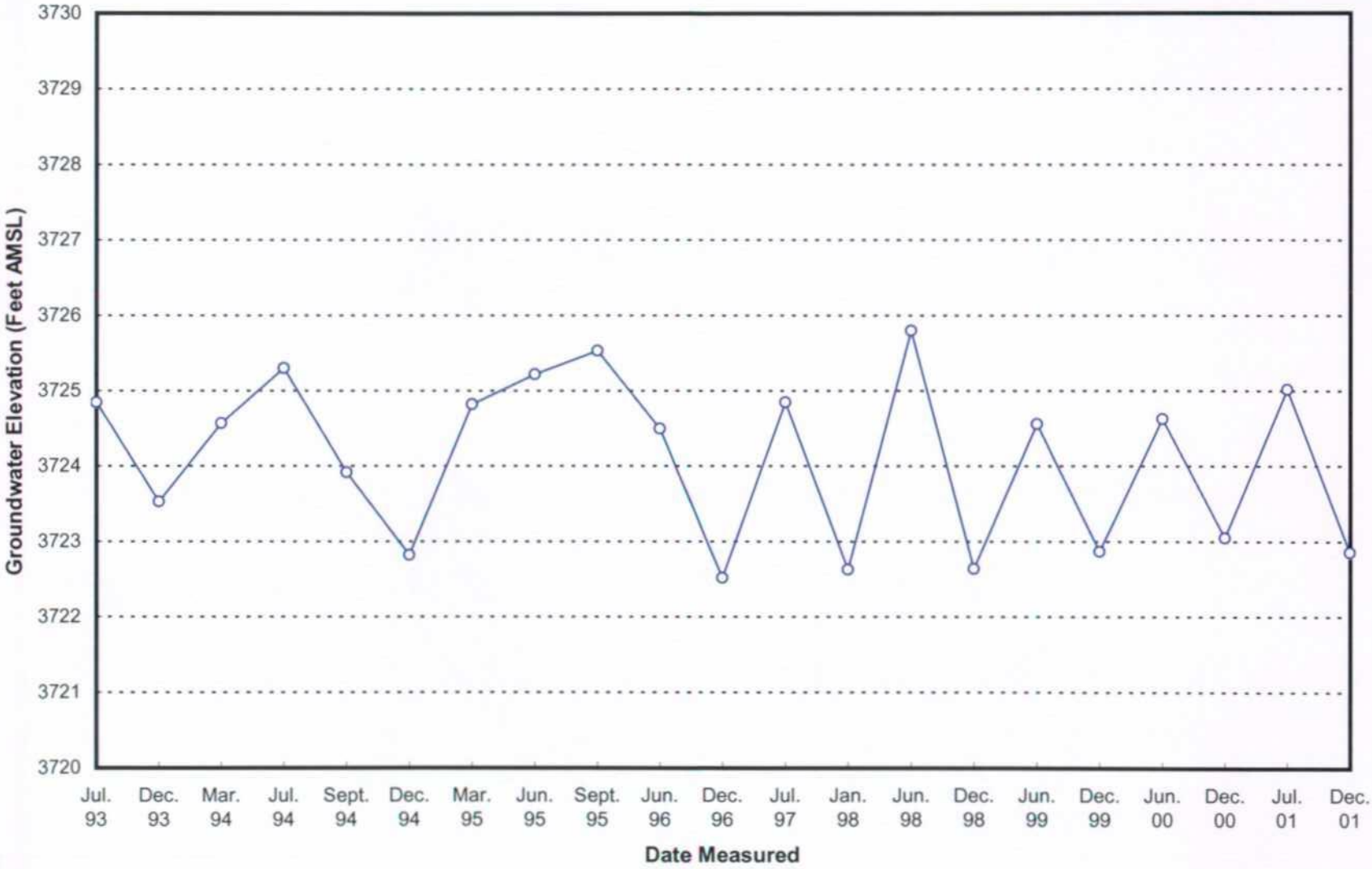
~3459907.xls:MW-6D WL

Brickland Refinery
MW-7 Groundwater Elevation Over Time



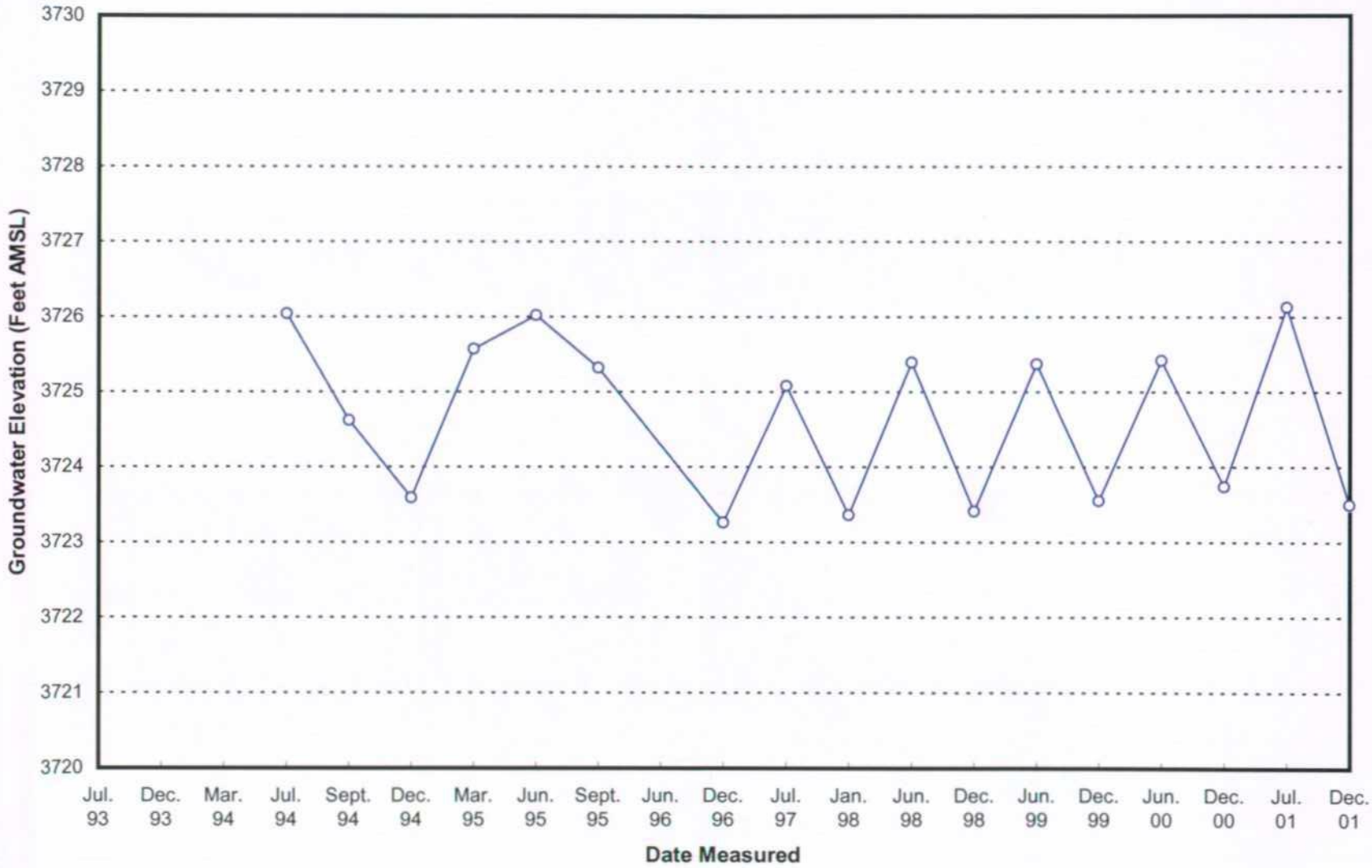
~3459907.xls:MW-7 WL

Brickland Refinery
MW-9S Groundwater Elevation Over Time



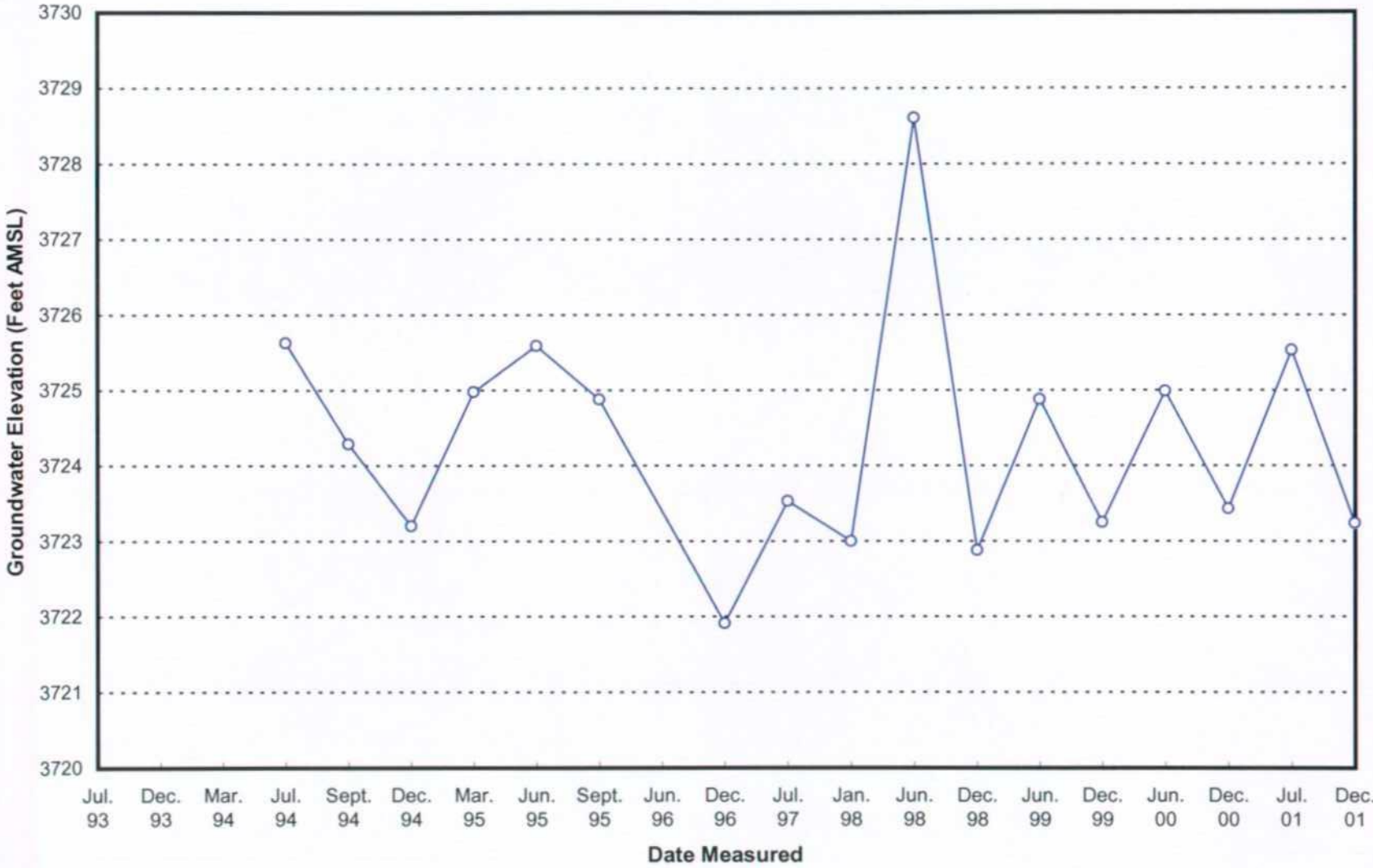
~3459907.xls:MW-9S WL

Brickland Refinery
MW-14 Groundwater Elevation Over Time



~3459907.xls:MW-14 WL

Brickland Refinery
MW-15 Groundwater Elevation Over Time



~3459907.xls:MW-15 WL

Please print or type
(Form designed for use on elite (12-pitch) typewriter.)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. [illegible]	Manifest Doc. No.	2. Page 1 of 1	

GENERATOR

3. Generator's Name and Mailing Address [illegible]

4. Generator's Phone ([illegible]) [illegible]

5. Transporter 1 Company Name [illegible]	6. US EPA ID Number [illegible]	A. Transporter's Phone [illegible]
7. Transporter 2 Company Name	8. US EPA ID Number	B. Transporter's Phone
9. Designated Facility Name and Site Address [illegible]	10. US EPA ID Number [illegible]	C. Facility's Phone [illegible]

11. Waste Shipping Name and Description	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. [illegible]	1	[illegible]	[illegible]	[illegible]
b.				
c.				
d.				

D. Additional Descriptions for Materials Listed Above [illegible]	E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information
[illegible]

16. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name	Signature	Month	Day	Year
		[illegible]	[illegible]	[illegible]

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

FACILITY

19. Discrepancy Indication Space
[illegible]

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

Printed by J. J. KELLER & ASSOCIATES, INC.
Neenah, WI 54957-0368

12-BLS-C5 Rev. 12/98

GENERATOR'S COPY

Summary Report

Mary Wells
Terracon
1630 Hickory Loop Suite H
Las Cruces, NM 88005

Report Date: January 3, 2002

Order ID Number: A01080323

Project Number: 68997611
Project Name: Huntsman
Project Location: Sunland Park, NM

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
176331	MW-15	Water	7/27/01	15:15	8/2/01
176332	MW-7	Water	7/27/01	16:03	8/2/01
176333	MW-6S	Water	7/31/01	12:33	8/2/01
176334	MW-6D	Water	7/31/01	13:33	8/2/01
176335	MW-3S	Water	7/31/01	15:28	8/2/01
176336	MW-9S	Water	8/1/01	12:52	8/2/01
176337	RIV-Down	Water	8/1/01	13:10	8/2/01
176338	MW-3D	Water	8/1/01	14:10	8/2/01
176339	MW-4	Water	8/1/01	15:07	8/2/01
176340	RIV-Up	Water	8/1/01	15:32	8/2/01
176341	MW-14	Water	8/2/01	12:44	8/2/01
176342	Dup	Water	8/2/01	12:41	8/2/01

This report consists of a total of 10 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)
176331 - MW-15	<0.005	<0.005	<0.005	<0.005	<0.005
176332 - MW-7	<0.005	0.014	<0.005	<0.005	0.014
176333 - MW-6S	0.012	0.014	0.015	<0.005	0.041
176334 - MW-6D	<0.001	<0.001	<0.001	<0.001	<0.001
176335 - MW-3S	<0.001	<0.001	<0.001	<0.001	<0.001
176336 - MW-9S	0.035	<0.005	<0.005	<0.005	0.035
176337 - RIV-Down	<0.001	0.003	<0.001	<0.001	0.003
176338 - MW-3D	<0.001	<0.001	<0.001	<0.001	<0.001
176339 - MW-4	0.196	<0.005	<0.005	<0.005	0.196
176340 - RIV-Up	<0.001	0.003	0.003	<0.001	0.006
176341 - MW-14	0.007	0.003	<0.001	<0.001	0.010
176342 - Dup	0.007	0.003	<0.001	<0.001	0.010

Sample: 176331 - MW-15

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L

Continued on next page ...

Sample 176331 continued ...

Param	Flag	Result	Units
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		<0.200	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.158	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		1.06000	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		0.0201	mg/L
Total Iron		1.86	mg/L
Total Lead		0.0123	mg/L
Total Manganese		2.1	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		<0.025	mg/L

Sample: 176332 - MW-7

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L

Continued on next page ...

Sample 176332 continued ...

Param	Flag	Result	Units
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		<0.200	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.211	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		0.618	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		<0.0125	mg/L
Total Iron		3.02	mg/L
Total Lead		0.0216	mg/L
Total Manganese		1.69	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		0.0262	mg/L

Sample: 176333 - MW-6S

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		0.604	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		0.0657	mg/L
Total Barium		0.763	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		1	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		0.0889	mg/L

Continued on next page ...

Sample 176333 continued ...

Param	Flag	Result	Units
Total Iron		5.53	mg/L
Total Lead		0.0171	mg/L
Total Manganese		1.34	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		0.0346	mg/L

Sample: 176334 - MW-6D

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		<0.200	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		<0.100	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		0.807	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		0.231	mg/L
Total Iron		0.920	mg/L
Total Lead		<0.01	mg/L
Total Manganese		5.36	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		<0.025	mg/L

Sample: 176335 - MW-3S

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		0.733	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		<0.100	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		0.653	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		0.0465	mg/L
Total Iron		2.08	mg/L
Total Lead		0.0122	mg/L
Total Manganese		1.31	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		<0.025	mg/L

Sample: 176336 - MW-9S

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L

Continued on next page ...

Sample 176336 continued ...

Param	Flag	Result	Units
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		8.58	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.304	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		1	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		0.0803	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		0.0672	mg/L
Total Iron		31.7	mg/L
Total Lead		0.0334	mg/L
Total Manganese		3.19	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		0.0877	mg/L

Sample: 176337 - RIV-Down

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		7.80	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.125	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		0.190	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L

Continued on next page ...

Sample 176337 continued ...

Param	Flag	Result	Units
Total Cobalt		<0.025	mg/L
Total Copper		0.0193	mg/L
Total Iron		4.71	mg/L
Total Lead		0.0115	mg/L
Total Manganese		0.261	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		0.0498	mg/L

Sample: 176338 - MW-3D

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		0.102	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		<0.100	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		0.941	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		<0.0125	mg/L
Total Iron		2.69	mg/L
Total Lead		<0.01	mg/L
Total Manganese		3.60	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		<0.025	mg/L

Sample: 176339 - MW-4

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		0.271	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.617	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		0.932	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		<0.0125	mg/L
Total Iron		3.17	mg/L
Total Lead		0.0175	mg/L
Total Manganese		4.31	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		<0.025	mg/L

Sample: 176340 - RIV-Up

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L

Continued on next page ...

Sample 176340 continued ...

Param	Flag	Result	Units
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		17.500000	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.155	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		0.252	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		<0.025	mg/L
Total Copper		0.0187	mg/L
Total Iron		9.79	mg/L
Total Lead		0.0112	mg/L
Total Manganese		0.416	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		0.0498	mg/L

Sample: 176341 - MW-14

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Naphthalene		<0.005	mg/L
Acenaphthylene		<0.005	mg/L
Acenaphthene		<0.005	mg/L
Fluorene		<0.005	mg/L
Phenanthrene		<0.005	mg/L
Anthracene		<0.005	mg/L
Fluoranthene		<0.005	mg/L
Pyrene		<0.005	mg/L
Benzo(a)anthracene		<0.005	mg/L
Chrysene		<0.005	mg/L
Benzo(b)fluoranthene		<0.005	mg/L
Benzo(k)fluoranthene		<0.005	mg/L
Benzo(a)pyrene		<0.005	mg/L
Indeno(1,2,3-cd)pyrene		<0.005	mg/L
Dibenzo(a,h)anthracene		<0.005	mg/L
Benzo(g,h,i)perylene		<0.005	mg/L
Total Aluminum		3.04	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.78	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		1.26	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L

Continued on next page ...

Sample 176341 continued ...

Param	Flag	Result	Units
Total Cobalt		0.11	mg/L
Total Copper		<0.0125	mg/L
Total Iron		10.5	mg/L
Total Lead		0.0154	mg/L
Total Manganese		11.5	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		<0.025	mg/L

Sample: 176342 - Dup

Param	Flag	Result	Units
Total Mercury		<0.0002	mg/L
Total Aluminum		1.09	mg/L
Total Antimony		<0.025	mg/L
Total Arsenic		<0.05	mg/L
Total Barium		0.70	mg/L
Total Beryllium		<0.0025	mg/L
Total Boron		1.20	mg/L
Total Cadmium		<0.025	mg/L
Total Chromium		<0.01	mg/L
Total Cobalt		0.138	mg/L
Total Copper		<0.0125	mg/L
Total Iron		10.4	mg/L
Total Lead		0.0158	mg/L
Total Manganese		11.4	mg/L
Total Molybdenum		<0.050	mg/L
Total Nickel		<0.025	mg/L
Total Selenium		<0.05	mg/L
Total Silver		<0.0125	mg/L
Total Thallium		<0.05	mg/L
Total Zinc		<0.025	mg/L

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

Mary Wells
Terracon
1630 Hickory Loop Suite H
Las Cruces, NM 88005

Report Date: January 3, 2002

Order ID Number: A01080323

Project Number: 68997611
Project Name: Huntsman
Project Location: Sunland Park, NM

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
176331	MW-15	Water	7/27/01	15:15	8/2/01
176332	MW-7	Water	7/27/01	16:03	8/2/01
176333	MW-6S	Water	7/31/01	12:33	8/2/01
176334	MW-6D	Water	7/31/01	13:33	8/2/01
176335	MW-3S	Water	7/31/01	15:28	8/2/01
176336	MW-9S	Water	8/1/01	12:52	8/2/01
176337	RIV-Down	Water	8/1/01	13:10	8/2/01
176338	MW-3D	Water	8/1/01	14:10	8/2/01
176339	MW-4	Water	8/1/01	15:07	8/2/01
176340	RIV-Up	Water	8/1/01	15:32	8/2/01
176341	MW-14	Water	8/2/01	12:44	8/2/01
176342	Dup	Water	8/2/01	12:41	8/2/01

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 32 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: 176331 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC13115	Date Analyzed:	8/6/01
Analyst:	CG	Preparation Method:	E 5030B	Prep Batch:	PB11203	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		0.505	mg/L	5	0.10	101	72 - 128
4-BFB		0.359	mg/L	5	0.10	71	72 - 128

Sample: 176331 - MW-15

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176331 - MW-15

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		64.26	mg/L	1	80	80	35 - 114
2-Fluorobiphenyl		61	mg/L	1	80	76	43 - 116
Terphenyl-d14		52.96	mg/L	1	80	66	33 - 141

Sample: 176331 - MW-15

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13128	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.200	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.158	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		1.06000	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.0201	mg/L	1	0.01
Total Iron		1.86	mg/L	1	0.05
Total Lead		0.0123	mg/L	1	0.01
Total Manganese		2.1	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		<0.025	mg/L	1	0.02

Sample: 176332 - 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		0.014	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		0.014	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.483	mg/L	5	0.10	96	72 - 128
4-BFB		0.439	mg/L	5	0.10	87	72 - 128

Sample: 176332 - MW-7

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176332 - MW-7

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		68.72	mg/L	1	80	85	35 - 114
2-Fluorobiphenyl		64.23	mg/L	1	80	80	43 - 116
Terphenyl-d14		58.96	mg/L	1	80	73	33 - 141

Sample: 176332 - MW-7

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13128	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.200	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.211	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		0.618	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		<0.0125	mg/L	1	0.01
Total Iron		3.02	mg/L	1	0.05
Total Lead		0.0216	mg/L	1	0.01
Total Manganese		1.69	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02

Continued ...

... Continued Sample: 176332 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		0.0262	mg/L	1	0.02

Sample: 176333 - MW-6S

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		0.012	mg/L	5	0.001
Toluene		0.014	mg/L	5	0.001
Ethylbenzene		0.015	mg/L	5	0.001
M,P,O-Xylene		<0.005	mg/L	5	0.001
Total BTEX		0.041	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.478	mg/L	5	0.10	95	72 - 128
4-BFB		0.431	mg/L	5	0.10	86	72 - 128

Sample: 176333 - MW-6S

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176333 - MW-6S

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005

Continued ...

... *Continued* Sample: 176333 Analysis: PAH

Param	Flag	Result	Units	Dilution	RDL
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		52.88	mg/L	1	80	66	35 - 114
2-Fluorobiphenyl		47.39	mg/L	1	80	59	43 - 116
Terphenyl-d14		45.36	mg/L	1	80	56	33 - 141

Sample: 176333 - MW-6S

Analysis: Total Metals Analytical Method: S 6010B QC Batch: QC13128 Date Analyzed: 8/7/01
Analyst: RR Preparation Method: E 3010A Prep Batch: PB11615 Date Prepared: 8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.604	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		0.0657	mg/L	1	0.01
Total Barium		0.763	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		1	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.0889	mg/L	1	0.01
Total Iron		5.53	mg/L	1	0.05
Total Lead		0.0171	mg/L	1	0.01
Total Manganese		1.34	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		0.0346	mg/L	1	0.02

Sample: 176334 - MW-6D

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

Continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[1]	0.0631	mg/L	1	0.10	63	72 - 128
4-BFB	[2]	0.0567	mg/L	1	0.10	57	72 - 128

Sample: 176334 - MW-6D

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176334 - MW-6D

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		56.55	mg/L	1	80	70	35 - 114
2-Fluorobiphenyl		53.77	mg/L	1	80	67	43 - 116
Terphenyl-d14		62.46	mg/L	1	80	78	33 - 141

Sample: 176334 - MW-6D

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13128	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

[1]Poor surrogate recovery due to lack of mixing.
[2]Poor surrogate recovery due to lack of mixing.

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<0.200	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		<0.100	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		0.807	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.231	mg/L	1	0.01
Total Iron		0.920	mg/L	1	0.05
Total Lead		<0.01	mg/L	1	0.01
Total Manganese		5.36	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		<0.025	mg/L	1	0.02

Sample: 176335 - MW-3S

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[3]	0.0659	mg/L	1	0.10	66	72 - 128
4-BFB	[4]	0.0596	mg/L	1	0.10	60	72 - 128

Sample: 176335 - MW-3S

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176335 - MW-3S

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

[3]Poor surrogate recovery due to lack of mixing.
[4]Poor surrogate recovery due to lack of mixing.

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		58.42	mg/L	1	80	73	35 - 114
2-Fluorobiphenyl		57.4	mg/L	1	80	71	43 - 116
Terphenyl-d14		72.37	mg/L	1	80	90	33 - 141

Sample: 176335 - MW-3S

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13128	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.733	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		<0.100	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		0.653	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.0465	mg/L	1	0.01
Total Iron		2.08	mg/L	1	0.05
Total Lead		0.0122	mg/L	1	0.01
Total Manganese		1.31	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		<0.025	mg/L	1	0.02

Sample: 176336 - MW-9S

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		0.035	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		0.035	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.486	mg/L	5	0.10	97	72 - 128
4-BFB		0.435	mg/L	5	0.10	87	72 - 128

Sample: 176336 - MW-9S

Analysis: Hg, Total | Analytical Method: S 7470A | QC Batch: QC13245 | Date Analyzed: 8/8/01
Analyst: BC | Preparation Method: N/A | Prep Batch: PB11221 | Date Prepared: 8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176336 - MW-9S

Analysis: PAH | Analytical Method: S 8270C | QC Batch: QC13334 | Date Analyzed: 8/14/01
Analyst: RC | Preparation Method: E 3510C | Prep Batch: PB11373 | Date Prepared: 8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		61.15	mg/L	1	80	76	35 - 114
2-Fluorobiphenyl		59.32	mg/L	1	80	74	43 - 116
Terphenyl-d14		48.83	mg/L	1	80	61	33 - 141

Sample: 176336 - MW-9S

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13128	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		8.58	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.304	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		1	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		0.0803	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.0672	mg/L	1	0.01
Total Iron		31.7	mg/L	1	0.05
Total Lead		0.0334	mg/L	1	0.01
Total Manganese		3.19	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		0.0877	mg/L	1	0.02

Sample: 176337 - RIV-Down

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		0.003	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		0.0752	mg/L	1	0.10	75	72 - 128
4-BFB	[5]	0.0679	mg/L	1	0.10	68	72 - 128

Sample: 176337 - RIV-Down

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

[5] Poor surrogate recovery due to lack of mixing.

Sample: 176337 - RIV-Down

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		56.97	mg/L	1	80	71	35 - 114
2-Fluorobiphenyl		54.49	mg/L	1	80	68	43 - 116
Terphenyl-d14		61.67	mg/L	1	80	77	33 - 141

Sample: 176337 - RIV-Down

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13130	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		7.80	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.125	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		0.190	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.0193	mg/L	1	0.01
Total Iron		4.71	mg/L	1	0.05
Total Lead		0.0115	mg/L	1	0.01
Total Manganese		0.261	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		0.0498	mg/L	1	0.02

Sample: 176338 - MW-3D

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

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[6]	0.0584	mg/L	1	0.10	58	72 - 128
4-BFB	[7]	0.0535	mg/L	1	0.10	54	72 - 128

Sample: 176338 - MW-3D

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176338 - MW-3D

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		59.05	mg/L	1	80	73	35 - 114

Continued ...

[6]Poor surrogate recovery due to lack of mixing.
[7]Poor surrogate recovery due to lack of mixing.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
2-Fluorobiphenyl		55.6	mg/L	1	80	69	43 - 116
Terphenyl-d14		62.98	mg/L	1	80	78	33 - 141

Sample: 176338 - MW-3D

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13130	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.102	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		<0.100	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		0.941	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		<0.0125	mg/L	1	0.01
Total Iron		2.69	mg/L	1	0.05
Total Lead		<0.01	mg/L	1	0.01
Total Manganese		3.60	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		<0.025	mg/L	1	0.02

Sample: 176339 - MW-4

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		0.196	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		0.196	mg/L	5	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.416	mg/L	5	0.10	83	72 - 128
4-BFB		0.366	mg/L	5	0.10	73	72 - 128

Sample: 176339 - MW-4

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176339 - MW-4

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		58.08	mg/L	1	80	72	35 - 114
2-Fluorobiphenyl		56.51	mg/L	1	80	70	43 - 116
Terphenyl-d14		44.4	mg/L	1	80	55	33 - 141

Sample: 176339 - MW-4

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13130	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11615	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		0.271	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.617	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		0.932	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		<0.0125	mg/L	1	0.01
Total Iron		3.17	mg/L	1	0.05
Total Lead		0.0175	mg/L	1	0.01
Total Manganese		4.31	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02

Continued ...

... *Continued* Sample: 176339 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		<0.025	mg/L	1	0.02

Sample: 176340 - RIV-Up

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		0.003	mg/L	1	0.001
Ethylbenzene		0.003	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.006	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[8]	0.0534	mg/L	1	0.10	53	72 - 128
4-BFB	[9]	0.047	mg/L	1	0.10	47	72 - 128

Sample: 176340 - RIV-Up

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13245	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11221	Date Prepared:	8/8/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176340 - RIV-Up

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005

Continued ...

[8]Poor surrogate recovery due to lack of mixing.
[9]Poor surrogate recovery due to lack of mixing.

... *Continued* Sample: 176340 Analysis: PAH

Param	Flag	Result	Units	Dilution	RDL
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		59.77	mg/L	1	80	74	35 - 114
2-Fluorobiphenyl		58.8	mg/L	1	80	73	43 - 116
Terphenyl-d14		59.3	mg/L	1	80	74	33 - 141

Sample: 176340 - RIV-Up

Analysis: Total Metals | Analytical Method: S 6010B | QC Batch: QC13130 | Date Analyzed: 8/7/01
Analyst: RR | Preparation Method: E 3010A | Prep Batch: PB11615 | Date Prepared: 8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		17.500000	mg/L	1	0.10
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.155	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		0.252	mg/L	1	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		<0.025	mg/L	1	0.02
Total Copper		0.0187	mg/L	1	0.01
Total Iron		9.79	mg/L	1	0.05
Total Lead		0.0112	mg/L	1	0.01
Total Manganese		0.416	mg/L	1	0.02
Total Molybdenum		<0.050	mg/L	1	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		0.0498	mg/L	1	0.02

Sample: 176341 - MW-14

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		0.003	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		0.010	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[10]	0.0692	mg/L	1	0.10	69	72 - 128
4-BFB	[11]	0.0608	mg/L	1	0.10	61	72 - 128

Sample: 176341 - MW-14

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13242	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11220	Date Prepared:	8/7/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176341 - MW-14

Analysis:	PAH	Analytical Method:	S 8270C	QC Batch:	QC13334	Date Analyzed:	8/14/01
Analyst:	RC	Preparation Method:	E 3510C	Prep Batch:	PB11373	Date Prepared:	8/3/01

Param	Flag	Result	Units	Dilution	RDL
Naphthalene		<0.005	mg/L	1	0.005
Acenaphthylene		<0.005	mg/L	1	0.005
Acenaphthene		<0.005	mg/L	1	0.005
Fluorene		<0.005	mg/L	1	0.005
Phenanthrene		<0.005	mg/L	1	0.005
Anthracene		<0.005	mg/L	1	0.005
Fluoranthene		<0.005	mg/L	1	0.005
Pyrene		<0.005	mg/L	1	0.005
Benzo(a)anthracene		<0.005	mg/L	1	0.005
Chrysene		<0.005	mg/L	1	0.005
Benzo(b)fluoranthene		<0.005	mg/L	1	0.005
Benzo(k)fluoranthene		<0.005	mg/L	1	0.005
Benzo(a)pyrene		<0.005	mg/L	1	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	1	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	1	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	1	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		61.86	mg/L	1	80	77	35 - 114
2-Fluorobiphenyl		61.77	mg/L	1	80	77	43 - 116
Terphenyl-d14		51.56	mg/L	1	80	64	33 - 141

Sample: 176341 - MW-14

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13130	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11616	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		3.04	mg/L	10	0.10
Total Antimony		<0.025	mg/L	1	0.02

Continued ...

[10] Poor surrogate recovery due to lack of mixing.
[11] Poor surrogate recovery due to lack of mixing.

... *Continued* Sample: 176341 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.78	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		1.26	mg/L	10	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		0.11	mg/L	1	0.02
Total Copper		<0.0125	mg/L	1	0.01
Total Iron		10.5	mg/L	10	0.05
Total Lead		0.0154	mg/L	1	0.01
Total Manganese		11.5	mg/L	10	0.02
Total Molybdenum		<0.050	mg/L	10	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		<0.025	mg/L	1	0.02

Sample: 176342 - Dup

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		0.003	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		0.010	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0865	mg/L	1	0.10	87	72 - 128
4-BFB		0.0774	mg/L	1	0.10	77	72 - 128

Sample: 176342 - Dup

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC13242	Date Analyzed:	8/8/01
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB11220	Date Prepared:	8/7/01

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 176342 - Dup

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC13130	Date Analyzed:	8/7/01
Analyst:	RR	Preparation Method:	E 3010A	Prep Batch:	PB11616	Date Prepared:	8/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		1.09	mg/L	10	0.10

Continued ...

... *Continued* Sample: 176342 Analysis: Total Metals

Param	Flag	Result	Units	Dilution	RDL
Total Antimony		<0.025	mg/L	1	0.02
Total Arsenic		<0.05	mg/L	1	0.01
Total Barium		0.70	mg/L	1	0.10
Total Beryllium		<0.0025	mg/L	1	0.0025
Total Boron		1.20	mg/L	10	0.01
Total Cadmium		<0.025	mg/L	1	0.005
Total Chromium		<0.01	mg/L	1	0.01
Total Cobalt		0.138	mg/L	1	0.02
Total Copper		<0.0125	mg/L	1	0.01
Total Iron		10.4	mg/L	10	0.05
Total Lead		0.0158	mg/L	1	0.01
Total Manganese		11.4	mg/L	10	0.02
Total Molybdenum		<0.050	mg/L	10	0.05
Total Nickel		<0.025	mg/L	1	0.02
Total Selenium		<0.05	mg/L	1	0.05
Total Silver		<0.0125	mg/L	1	0.01
Total Thallium		<0.05	mg/L	1	0.05
Total Zinc		<0.025	mg/L	1	0.02

Quality Control Report
Method Blank

Method Blank

QCBatch: QC13115

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		0.107	mg/L	1	0.10	107	72 - 128
4-BFB		0.0746	mg/L	1	0.10	75	72 - 128

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: QC13128

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.200	mg/L	0.10
Total Antimony		<0.025	mg/L	0.02
Total Arsenic		<0.05	mg/L	0.01
Total Barium		<0.100	mg/L	0.10
Total Beryllium		<0.0025	mg/L	0.0025
Total Boron		<0.010	mg/L	0.01
Total Cadmium		<0.025	mg/L	0.005
Total Chromium		<0.01	mg/L	0.01
Total Cobalt		<0.025	mg/L	0.02
Total Copper		<0.0125	mg/L	0.01
Total Iron		<0.050	mg/L	0.05

Continued ...

... Continued

Param	Flag	Results	Units	Reporting Limit
Total Lead		<0.01	mg/L	0.01
Total Manganese		<0.025	mg/L	0.02
Total Molybdenum		<0.050	mg/L	0.05
Total Nickel		<0.025	mg/L	0.02
Total Selenium		<0.05	mg/L	0.05
Total Silver		<0.0125	mg/L	0.01
Total Thallium		<0.05	mg/L	0.05
Total Zinc		<0.025	mg/L	0.02

Method Blank

QCBatch: QC13130

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.50	mg/L	0.10
Total Antimony		<0.025	mg/L	0.02
Total Arsenic		<0.05	mg/L	0.01
Total Barium		<0.100	mg/L	0.10
Total Beryllium		<0.0025	mg/L	0.0025
Total Boron		<0.010	mg/L	0.01
Total Cadmium		<0.025	mg/L	0.005
Total Chromium		<0.01	mg/L	0.01
Total Cobalt		<0.025	mg/L	0.02
Total Copper		<0.0125	mg/L	0.01
Total Iron		<0.10	mg/L	0.05
Total Lead		<0.01	mg/L	0.01
Total Manganese		<0.010	mg/L	0.02
Total Molybdenum		<0.050	mg/L	0.05

Method Blank

QCBatch: QC13242

Param	Flag	Results	Units	Reporting Limit
Total Mercury		<0.0002	mg/L	0.0002

Method Blank

QCBatch: QC13245

Param	Flag	Results	Units	Reporting Limit
Total Mercury		<0.0002	mg/L	0.0002

Method Blank

QCBatch: QC13334

Param	Flag	Results	Units	Reporting Limit
Benzo(a)anthracene		<0.005	mg/L	0.005

Continued ...

... Continued

Param	Flag	Results	Units	Reporting Limit
Chrysene		<0.005	mg/L	0.005
Benzo(b)fluoranthene		<0.005	mg/L	0.005
Benzo(k)fluoranthene		<0.005	mg/L	0.005
Benzo(a)pyrene		<0.005	mg/L	0.005
Indeno(1,2,3-cd)pyrene		<0.005	mg/L	0.005
Dibenzo(a,h)anthracene		<0.005	mg/L	0.005
Benzo(g,h,i)perylene		<0.005	mg/L	0.005

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Nitrobenzene-d5		41.26	mg/L	1	80	51	35 - 114
2-Fluorobiphenyl		40.5	mg/L	1	80	50	43 - 116
Terphenyl-d14		42.91	mg/L	1	80	53	33 - 141

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC13115

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.103	0.106	mg/L	1	0.10	<0.001	103	2	80 - 120	20
Benzene	0.096	0.102	mg/L	1	0.10	<0.001	96	6	80 - 120	20
Toluene	0.097	0.103	mg/L	1	0.10	<0.001	97	5	80 - 120	20
Ethylbenzene	0.096	0.102	mg/L	1	0.10	<0.001	96	6	80 - 120	20
M,P,O-Xylene	0.287	0.304	mg/L	1	0.30	<0.001	95	5	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	0.109	0.115	mg/L	1	0.10	109	115	72 - 128
4-BFB	0.107	0.111	mg/L	1	0.10	107	111	72 - 128

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: QC13128

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.180000	1.140000	mg/L	1	1	<0.200	106	3	75 - 125	20
Total Antimony	0.248	0.232	mg/L	1	0.25	<0.025	99	6	75 - 125	20
Total Arsenic	0.505	0.498	mg/L	1	0.50	<0.05	101	1	75 - 125	20
Total Barium	1.060000	1.050000	mg/L	1	1	<0.100	106	1	75 - 125	20
Total Beryllium	0.0239	0.0236	mg/L	1	0.02	<0.0025	95	1	75 - 125	20
Total Boron	0.0342	0.0329	mg/L	1	0.05	<0.010	68	4	75 - 125	20
Total Cadmium	0.241	0.236	mg/L	1	0.25	<0.025	96	2	75 - 125	20
Total Chromium	0.0988	0.094	mg/L	1	0.10	<0.01	98	4	75 - 125	20
Total Cobalt	0.263	0.265	mg/L	1	0.25	<0.025	105	1	75 - 125	20
Total Copper	0.126	0.119	mg/L	1	0.12	<0.0125	100	5	75 - 125	20
Total Iron	0.540	0.537	mg/L	1	0.50	<0.050	108	0	75 - 125	20
Total Lead	0.482	0.473	mg/L	1	0.50	<0.01	96	1	75 - 125	20
Total Manganese	0.266	0.263	mg/L	1	0.25	<0.025	106	1	75 - 125	20
Total Molybdenum	0.506	0.515	mg/L	1	0.50	<0.050	101	2	75 - 125	20
Total Nickel	0.242	0.231	mg/L	1	0.25	<0.025	96	4	75 - 125	20
Total Selenium	0.437	0.428	mg/L	1	0.50	<0.05	87	2	75 - 125	20
Total Silver	0.121	0.118	mg/L	1	0.12	<0.0125	96	2	75 - 125	20
Total Thallium	0.444	0.449	mg/L	1	0.50	<0.05	88	1	75 - 125	20
Total Zinc	0.26	0.257	mg/L	1	0.25	<0.025	104	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: QC13130

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.100000	1.07	mg/L	1	1	<0.50	110	2	75 - 125	20
Total Antimony	0.241	0.243	mg/L	1	0.25	<0.025	96	0	75 - 125	20
Total Arsenic	0.505	0.502	mg/L	1	0.50	<0.05	101	0	75 - 125	20
Total Barium	1.040000	1.02	mg/L	1	1	<0.100	104	1	75 - 125	20
Total Beryllium	0.0239	0.0239	mg/L	1	0.02	<0.0025	95	0	75 - 125	20
Total Boron	0.049	0.045	mg/L	1	0.05	<0.010	98	8	75 - 125	20
Total Cadmium	0.24	0.241	mg/L	1	0.25	<0.025	96	0	75 - 125	20
Total Chromium	0.0948	0.0965	mg/L	1	0.10	<0.01	94	1	75 - 125	20
Total Cobalt	0.240	0.233	mg/L	1	0.25	<0.025	96	3	75 - 125	20
Total Copper	0.119	0.119	mg/L	1	0.12	<0.0125	95	0	75 - 125	20
Total Iron	0.511	0.493	mg/L	1	0.50	<0.10	86	4	75 - 125	20
Total Lead	0.474	0.478	mg/L	1	0.50	<0.01	94	0	75 - 125	20
Total Manganese	0.274	0.241	mg/L	1	0.25	<0.010	109	12	75 - 125	20
Total Molybdenum	0.522	0.522	mg/L	1	0.50	<0.050	104	0	75 - 125	20
Total Nickel	0.234	0.23	mg/L	1	0.25	<0.025	93	1	75 - 125	20
Total Selenium	0.434	0.434	mg/L	1	0.50	<0.05	86	0	75 - 125	20
Total Silver	0.12	0.121	mg/L	1	0.12	<0.0125	96	0	75 - 125	20
Total Thallium	0.431	0.434	mg/L	1	0.50	<0.05	86	0	75 - 125	20
Total Zinc	0.256	0.259	mg/L	1	0.25	<0.025	102	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: QC13242

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00115	0.00115	mg/L	1	0.001	<0.0002	115	0	84 - 125	20

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

Laboratory Control Spikes

QCBatch: QC13245

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00120	0.00116	mg/L	1	0.001	<0.0002	120	3	84 - 125	20

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

Laboratory Control Spikes

QCBatch: QC13334

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Naphthalene	47.51	41.9	mg/L	1	80	<0.005	59	12	21 - 133	20
Acenaphthylene	56.97	47.27	mg/L	1	80	<0.005	71	18	33 - 145	20
Acenaphthene	53.87	44.91	mg/L	1	80	<0.005	67	18	47 - 145	20
Fluorene	53.84	46.7	mg/L	1	80	<0.005	67	14	59 - 121	20
Phenanthrene	56.31	50.45	mg/L	1	80	<0.005	70	10	54 - 120	20
Anthracene	55.04	51.31	mg/L	1	80	<0.005	68	7	27 - 133	20
Fluoranthene	59.19	52.02	mg/L	1	80	<0.005	73	12	26 - 137	20
Pyrene	57.05	56.87	mg/L	1	80	<0.005	71	0	52 - 115	20
Benzo(a)anthracene	54.99	55.96	mg/L	1	80	<0.005	68	1	33 - 143	20
Chrysene	84.12	84.89	mg/L	1	80	<0.005	105	0	17 - 168	20
Benzo(b)fluoranthene	51.08	51.37	mg/L	1	80	<0.005	63	0	33 - 143	20
Benzo(k)fluoranthene	59.03	64.15	mg/L	1	80	<0.005	73	8	17 - 168	20
Benzo(a)pyrene	50.64	53.21	mg/L	1	80	<0.005	63	4	24 - 159	20
Indeno(1,2,3-cd)pyrene	56.78	51.7	mg/L	1	80	<0.005	70	9	0 - 171	20
Dibenzo(a,h)anthracene	49.71	50.11	mg/L	1	80	<0.005	62	0	0 - 227	20
Benzo(g,h,i)perylene	51.6	56.03	mg/L	1	80	<0.005	64	8	0 - 219	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
Nitrobenzene-d5	67.33	58.59	mg/L	1	80	84	73	35 - 114
2-Fluorobiphenyl	68.66	57.47	mg/L	1	80	85	71	43 - 116
Terphenyl-d14	39.03	41.15	mg/L	1	80	48	51	33 - 141

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC13128

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	1.23	1.200000	mg/L	1	1	<0.200	123	2	75 - 125	20
Total Antimony	0.252	0.243	mg/L	1	0.25	<0.025	100	3	75 - 125	20
Total Arsenic	0.539	0.507	mg/L	1	0.50	<0.05	107	6	75 - 125	20
Total Barium	1.03	1.010000	mg/L	1	1	0.158	103	2	75 - 125	20
Total Beryllium	0.023	0.0227	mg/L	1	0.02	<0.0025	92	1	75 - 125	20
Total Boron	0.66	0.622	mg/L	1	0.05	1.06000	84	6	75 - 125	20
Total Cadmium	0.232	0.229	mg/L	1	0.25	<0.025	92	1	75 - 125	20
Total Chromium	0.0934	0.0912	mg/L	1	0.10	<0.01	93	2	75 - 125	20
Total Cobalt	0.248	0.249	mg/L	1	0.25	<0.025	99	0	75 - 125	20
Total Copper	0.165	0.16	mg/L	1	0.12	0.0201	115	3	75 - 125	20
Total Iron	3.46	3.34	mg/L	1	0.50	1.86	88	7	75 - 125	20
Total Lead	0.498	0.479	mg/L	1	0.50	0.0123	97	3	75 - 125	20
Total Manganese	1.9	1.84	mg/L	1	0.25	2.1	84	0	75 - 125	20
Total Molybdenum	0.502	0.502	mg/L	1	0.50	<0.050	100	0	75 - 125	20
Total Nickel	0.253	0.249	mg/L	1	0.25	<0.025	101	1	75 - 125	20
Total Selenium	0.445	0.436	mg/L	1	0.50	<0.05	89	2	75 - 125	20
Total Silver	0.129	0.126	mg/L	1	0.12	<0.0125	103	2	75 - 125	20
Total Thallium	0.502	0.482	mg/L	1	0.50	<0.05	100	4	75 - 125	20
Total Zinc	0.248	0.25	mg/L	1	0.25	<0.025	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: QC13130

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	[12] 2.140000	[13] 2.390000	mg/L	10	1	7.80	-565	11	75 - 125	20
Total Antimony	0.234	0.212	mg/L	1	0.25	<0.025	93	9	75 - 125	20
Total Arsenic	0.495	0.51	mg/L	1	0.50	<0.05	99	2	75 - 125	20
Total Barium	1.83	2.010000	mg/L	10	1	0.125	170	9	75 - 125	20
Total Beryllium	0.0232	0.0232	mg/L	1	0.02	<0.0025	92	0	75 - 125	20
Total Boron	[14] 1.220000	[15] 1.170000	mg/L	10	0.05	0.190	2060	4	75 - 125	20
Total Cadmium	0.231	0.233	mg/L	1	0.25	<0.025	92	0	75 - 125	20
Total Chromium	0.095	0.0973	mg/L	1	0.10	<0.01	95	2	75 - 125	20
Total Cobalt	0.422	<0.250	mg/L	10	0.25	<0.025	168	200	75 - 125	20
Total Copper	0.139	0.136	mg/L	1	0.12	0.0193	95	2	75 - 125	20
Total Iron	[16] 10.60000	[17] 10.40000	mg/L	10	0.50	4.71	212	2	75 - 125	20
Total Lead	0.466	0.476	mg/L	1	0.50	0.0115	90	2	75 - 125	20
Total Manganese	11.50000	11.20000	mg/L	10	0.25	0.261	460	3	75 - 125	20
Total Molybdenum	<0.500	0.407	mg/L	10	0.50	<0.050	0	0	75 - 125	20
Total Nickel	0.224	0.231	mg/L	1	0.25	<0.025	89	3	75 - 125	20
Total Selenium	0.431	0.435	mg/L	1	0.50	<0.05	86	0	75 - 125	20
Total Silver	0.119	0.119	mg/L	1	0.12	<0.0125	95	0	75 - 125	20
Total Thallium	0.429	0.445	mg/L	1	0.50	<0.05	85	3	75 - 125	20
Total Zinc	0.272	0.274	mg/L	1	0.25	0.0498	88	0	75 - 125	20

[12]Matrix recovery invalid due to required dilution. LCS demonstrates process under control.
[13]Matrix recovery invalid due to required dilution. LCS demonstrates process under control.
[14]Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control.
[15]Matrix recovery invalid due to required dilution. LCS demonstrates process under control.
[16]Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control.
[17]Matrix recovery invalid due to required dilution. LCS demonstrates process under control.

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

Matrix Spikes

QCBatch: QC13242

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00109	0.00109	mg/L	1	0.001	<0.0002	109	0	84 - 127	20

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

Matrix Spikes

QCBatch: QC13245

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00111	0.00112	mg/L	1	0.001	<0.0002	111	0	84 - 127	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: QC13115

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.080	80	85 - 115	8/6/01
Benzene		mg/L	0.10	0.086	86	85 - 115	8/6/01
Toluene		mg/L	0.10	0.085	85	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.083	83	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.247	82	85 - 115	8/6/01

CCV (2)

QCBatch: QC13115

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	0.097	97	85 - 115	8/6/01
Toluene		mg/L	0.10	0.098	98	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.098	98	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.29	96	85 - 115	8/6/01

ICV (1)

QCBatch: QC13115

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.095	95	85 - 115	8/6/01
Benzene		mg/L	0.10	0.096	96	85 - 115	8/6/01
Toluene		mg/L	0.10	0.096	96	85 - 115	8/6/01
Ethylbenzene		mg/L	0.10	0.095	95	85 - 115	8/6/01
M,P,O-Xylene		mg/L	0.30	0.283	94	85 - 115	8/6/01

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: QC13128

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.900000	89	90 - 110	8/7/01

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Antimony		mg/L	0.50	0.49	98	90 - 110	8/7/01
Total Arsenic		mg/L	1	1	100	90 - 110	8/7/01
Total Barium		mg/L	2	1.940000	97	90 - 110	8/7/01
Total Beryllium		mg/L	0.05	0.0485	97	90 - 110	8/7/01
Total Boron		mg/L	0.10	0.107	107	90 - 110	8/7/01
Total Cadmium		mg/L	0.50	0.484	96	90 - 110	8/7/01
Total Chromium		mg/L	0.20	0.197	98	90 - 110	8/7/01
Total Cobalt		mg/L	0.50	0.486	97	90 - 110	8/7/01
Total Copper		mg/L	0.25	0.24	96	90 - 110	8/7/01
Total Iron		mg/L	1	0.976	98	90 - 110	8/7/01
Total Lead		mg/L	1	0.974	97	90 - 110	8/7/01
Total Manganese		mg/L	0.50	0.480	96	90 - 110	8/7/01
Total Molybdenum		mg/L	1	0.979	98	90 - 110	8/7/01
Total Nickel		mg/L	0.50	0.494	98	90 - 110	8/7/01
Total Selenium		mg/L	1	0.998	99	90 - 110	8/7/01
Total Silver		mg/L	0.25	0.245	98	90 - 110	8/7/01
Total Thallium		mg/L	1	1.01	101	90 - 110	8/7/01
Total Zinc		mg/L	0.50	0.488	97	90 - 110	8/7/01

ICV (1)

QCBatch: QC13128

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.980000	93	90 - 110	8/7/01
Total Antimony		mg/L	0.50	0.506	101	90 - 110	8/7/01
Total Arsenic		mg/L	1	1.01	101	90 - 110	8/7/01
Total Barium		mg/L	2	2.010000	100	90 - 110	8/7/01
Total Beryllium		mg/L	0.05	0.0489	97	90 - 110	8/7/01
Total Boron		mg/L	0.10	0.101	101	90 - 110	8/7/01
Total Cadmium		mg/L	0.50	0.492	98	90 - 110	8/7/01
Total Chromium		mg/L	0.20	0.201	100	90 - 110	8/7/01
Total Cobalt		mg/L	0.50	0.502	100	90 - 110	8/7/01
Total Copper		mg/L	0.25	0.241	96	90 - 110	8/7/01
Total Iron		mg/L	1	0.999	100	90 - 110	8/7/01
Total Lead		mg/L	1	0.995	99	90 - 110	8/7/01
Total Manganese		mg/L	0.50	0.500	100	90 - 110	8/7/01
Total Molybdenum		mg/L	1	1.000000	100	90 - 110	8/7/01
Total Nickel		mg/L	0.50	0.501	100	90 - 110	8/7/01
Total Selenium		mg/L	1	1.01	101	90 - 110	8/7/01
Total Silver		mg/L	0.25	0.244	97	90 - 110	8/7/01
Total Thallium		mg/L	1	1.04	104	90 - 110	8/7/01
Total Zinc		mg/L	0.50	0.5	100	90 - 110	8/7/01

CCV (1)

QCBatch: QC13130

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.820000	91	90 - 110	8/7/01
Total Antimony		mg/L	0.50	0.501	100	90 - 110	8/7/01
Total Arsenic		mg/L	1	1.02	102	90 - 110	8/7/01
Total Barium		mg/L	2	1.88000	94	90 - 110	8/7/01
Total Beryllium		mg/L	0.05	0.0498	99	90 - 110	8/7/01
Total Boron		mg/L	0.10	0.102	102	90 - 110	8/7/01
Total Cadmium		mg/L	0.50	0.498	99	90 - 110	8/7/01
Total Chromium		mg/L	0.20	0.201	100	90 - 110	8/7/01
Total Cobalt		mg/L	0.50	0.464	93	90 - 110	8/7/01
Total Copper		mg/L	0.25	0.243	97	90 - 110	8/7/01
Total Iron		mg/L	1	0.951	95	90 - 110	8/7/01
Total Lead		mg/L	1	0.989	98	90 - 110	8/7/01
Total Manganese		mg/L	0.50	0.464	92	90 - 110	8/7/01
Total Molybdenum		mg/L	1	0.974	97	90 - 110	8/7/01
Total Nickel		mg/L	0.50	0.498	99	90 - 110	8/7/01
Total Selenium		mg/L	1	1.01	101	90 - 110	8/7/01
Total Silver		mg/L	0.25	0.25	100	90 - 110	8/7/01
Total Thallium		mg/L	1	1.02	102	90 - 110	8/7/01
Total Zinc		mg/L	0.50	0.504	100	90 - 110	8/7/01

ICV (1) QCBatch: QC13130

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.90000	95	90 - 110	8/7/01
Total Antimony		mg/L	0.50	0.506	101	90 - 110	8/7/01
Total Arsenic		mg/L	1	1.01	101	90 - 110	8/7/01
Total Barium		mg/L	2	1.990000	100	90 - 110	8/7/01
Total Beryllium		mg/L	0.05	0.0489	97	90 - 110	8/7/01
Total Boron		mg/L	0.10	0.105	105	90 - 110	8/7/01
Total Cadmium		mg/L	0.50	0.492	98	90 - 110	8/7/01
Total Chromium		mg/L	0.20	0.201	100	90 - 110	8/7/01
Total Cobalt		mg/L	0.50	0.493	99	90 - 110	8/7/01
Total Copper		mg/L	0.25	0.241	96	90 - 110	8/7/01
Total Iron		mg/L	1	1.010000	101	90 - 110	8/7/01
Total Lead		mg/L	1	0.995	99	90 - 110	8/7/01
Total Manganese		mg/L	0.50	0.484	96	90 - 110	8/7/01
Total Molybdenum		mg/L	1	1.030000	103	90 - 110	8/7/01
Total Nickel		mg/L	0.50	0.501	100	90 - 110	8/7/01
Total Selenium		mg/L	1	1.01	101	90 - 110	8/7/01
Total Silver		mg/L	0.25	0.244	97	90 - 110	8/7/01
Total Thallium		mg/L	1	1.04	104	90 - 110	8/7/01
Total Zinc		mg/L	0.50	0.5	100	90 - 110	8/7/01

CCV (1) QCBatch: QC13242

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00108	108	80 - 120	8/8/01

ICV (1) QCBatch: QC13242

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00111	111	80 - 120	8/8/01

CCV (1) QCBatch: QC13245

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00109	109	80 - 120	8/8/01

ICV (1) QCBatch: QC13245

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00108	108	80 - 120	8/8/01

CCV (1) QCBatch: QC13334

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Naphthalene		mg/L	60	60.54	100	80 - 120	8/14/01
Acenaphthylene		mg/L	60	60.48	100	80 - 120	8/14/01
Acenaphthene		mg/L	60	59.51	99	80 - 120	8/14/01
Fluorene		mg/L	60	60.04	100	80 - 120	8/14/01
Phenanthrene		mg/L	60	59.64	99	80 - 120	8/14/01
Anthracene		mg/L	60	60.78	101	80 - 120	8/14/01
Fluoranthene		mg/L	60	61.29	102	80 - 120	8/14/01
Pyrene		mg/L	60	59.11	98	80 - 120	8/14/01
Benzo(a)anthracene		mg/L	60	61.4	102	0 - 120	8/14/01
Chrysene		mg/L	60	59.69	99	0 - 120	8/14/01
Benzo(b)fluoranthene		mg/L	60	63.24	105	80 - 120	8/14/01
Benzo(k)fluoranthene		mg/L	60	59.62	99	80 - 120	8/14/01
Benzo(a)pyrene		mg/L	60	58.29	97	80 - 120	8/14/01
Indeno(1,2,3-cd)pyrene		mg/L	60	58.9	98	80 - 120	8/14/01
Dibenzo(a,h)anthracene		mg/L	60	61.01	101	80 - 120	8/14/01
Benzo(g,h,i)perylene		mg/L	60	61.89	103	80 - 120	8/14/01
Nitrobenzene-d5		mg/L	60	63.51	105	80 - 120	8/14/01

Continued ...

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
2-Fluorobiphenyl		mg/L	60	60.78	101	80 - 120	8/14/01
Terphenyl-d14		mg/L	60	59.35	98	80 - 120	8/14/01

176331-42

Page 1 of 4

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

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 # A0108023

Company Name: Terracon
Phone #: (505) 527-1700
Address: (Street, City, Zip) 1630 Hickory Loop, Suite H, Las Cruces, NM 88005
Fax #: (505) 527-1092
Contact Person: LINDA RIGGINS
Invoice to: (If different from above) Huntsman Polymers Corporation
Project #: 68997611
Project Name: Huntsman
Project Location: Sunland Park, NM
Sampler Signature: Linda Riggins

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
176331	MW 15	2	40 ml	X				X				X		7/27	3:15 pm
		1	500 ml	X					X			X			
		1	1 L	X								X			
32	MW 7	2	40 ml	X				X				X		7/27	4:03 pm
		1	500 ml	X					X			X			
		1	1 L	X								X			
33	MW 6S	2	40 ml	X				X				X		7/27	12:33 pm
		1	500 ml	X					X			X			
		1	1 L	X								X			
34	MW 6D	2	40 ml	X				X				X		7/31	1:33 pm
		1	500 ml	X					X			X			

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	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	Priority Pollutant Metals (See Attached List)					Turn Around Time if different from standard	Hold
	X		X												X						
															X						
			X																		
	X														X						
			X																		
	X														X						
			X																		
	X														X						
			X																		
	X														X						

Relinquished by: Linda Riggins Date: 8/2 Time: 2:32 pm
Received by: Date: 8/2/01 Time: 1430
Relinquished by: Date: Time:
Received by: Date: Time:
Relinquished by: Date: Time:
Received at Laboratory by: Date: Time:

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 4 °
Log-in Review

REMARKS: 8/16

☐ Check If Special Reporting Limits Are Needed

Carrier # WALK-IN 1Z3124XW0143203345

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

4725 Ripley Dr., Ste A
El Paso, Texas 79922-1028
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID #

Company Name: Terracon
Phone #: (505) 527-1700
Address: (Street, City, Zip) 1630 Hickory Loop Suite H
Fax #: (505) 527-1092
Contact Person: Las Cruces, NM 88005 — LINDA RIGGINS
Invoice to: (If different from above) Huntsman Polymers Corporation
Project #: 6899761
Project Name: Huntsman
Project Location: Sunland Park, NM
Sampler Signature: Linda Riggins

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO3	$NaHSO_4$	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	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	Priority Pollutant Metals (see Attached List)		Turn Around Time if different from standard	Hold
176334	MW6D	1	1L	X									X		7/31	1:33 pm				X															
35	MW3S	2	40ml	X				X					X		7/31	3:28 pm		X																	
	↓	1	500ml	X					X				X		↓	↓															X				
	↓	1	1L	X									X		↓	↓				X															
36 ~~35~~	MW9S	2	40ml	X				X					X		8/1	12:52 pm		X																	
	↓	1	500ml	X					X				X		↓	↓															X				
	↓	1	1L	X									X		↓	↓				X															
37 ~~36~~	RIV-Down	2	40ml	X				X					X		8/1	1:10 pm		X																	
	↓	1	500ml	X					X				X		↓	↓															X				
	↓	1	1L	X									X		↓	↓				X															
38	MW3D	2	40ml	X				X					X		8-1	2:10 pm		X																	

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Linda Riggins	8/2	2:32 pm	[signature]	8/2/01	1430
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
Greene	8/2/01	16:00	Vick. Dunaj	8-3-01	10:00

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

REMARKS:

Carrier # [illegible] LZ3124XWD1 4320 3345

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

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

4725 Ripley Dr., Ste A
El Paso, Texas 79922-1028
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID #

Company Name: Terracon
Phone #: (505) 527-1700
Address: (Street, City, Zip) 1630 Hickory Loop, Suite H, Las Cruces, NM 88005
Fax #: (505) 527-1092
Contact Person: Linda Riggins
Invoice to: (If different from above) Huntsman Polymers Corporation
Project #: 68997611
Project Name: Huntsman
Project Location: Sunland Park, NM
Sampler Signature: Linda Riggins

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO3	$NaHSO_4$	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	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	Priority Pollutant Metals (see Attached List)			Turn Around Time if different from standard	Hold
176337	MW3D	1	500 ml	X					X				X		8-1	2:10 pm																X				
	↓	1	1L	X									X		↓	↓				X																
3938	MW4	2	40ml	X				X					X		8-1	3:07 pm		X																		
		1	500 ml	X					X				X																			X				
	↓	1	1L	X									X		↓	↓				X																
4039	RIV-UP	2	40ml	X				X					X		8-1	3:32 pm		X																		
		1	500 ml	X					X				X																			X				
	↓	1	1L	X									X		↓	↓				X																
4140	MW14	2	40ml	X				X					X		8-2	12:44 pm		X																		
		1	500ml	X					X				X																			X				
	↓	1	1L	X									X		↓	↓				X																

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Linda Riggins	8/2	2:32 pm	[signature]	8/2	1430
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
[signature]	8/2/01	16:00	[signature]	8.3.01	10:00

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

REMARKS:

Carrier # WAIL - ~17312 4XW01422D3345

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

Page 4 of 4

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

4725 Ripley Dr., Ste A
El Paso, Texas 79922-1028
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID #

Company Name: Terracon
Phone #: (505) 527-1700
Address: (Street, City, Zip) 1630 Hickory Loop, Suite H Las Cruces, NM 88005
Fax #: (505) 527-1092
Contact Person: LINDA RIGGINS
Invoice to: (If different from above) Huntsman Polymers Corporation
Project #: 6899761I
Project Name: Huntsman
Project Location: Sunland Park, NM
Sampler Signature: Linda Riggs

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO3	$NaHSO_4$	H_2SO_4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
176342	Dup	2	40ml	X				X					X		8-2	12:41 pm
	↓	1	500 ml	X					X				X		↓	↓
	↓ (BROKEN)	1	1L	X									X		↓	↓

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB #	MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	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	Priority Pollutant Metals (See Attached list)	Turn Around Time if different from standard	Hold
176342 (row 1)		X																
(row 2)																X		
(row 3)				X														

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Linda Riggs	8/2	2:32 pm	[signature]	8/2/01	1430
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by:	Date:	Time:
[signature]	8/2/01	16:01	[signature]	8-3-01	10:00

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

REMARKS:

Carrier # Walk-in 1Z3124XW0143203345

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

176440

Page 1 of 1

6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

4725 Ripley Dr., Ste A
El Paso, Texas 79922-1028
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A01080609

Company Name: Terracon
Phone #: (505) 527-1700
Address: (Street, City, Zip) 1630 Hickory loop, Suite H
Fax #: (505) 527-1092
Contact Person: Las Cruces, NM 88005 Fred Small ~~LINDA RIGGINS~~
Invoice to: (If different from above) Huntsman Polymers Corporation
Project #: 68997611
Project Name: Huntsman
Project Location: Sunland Park, NM
Sampler Signature: Linda Riggins

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE		PRESERVATIVE METHOD: HCL	HNO3	NaHSO4	H2SO4	NaOH	ICE	NONE		SAMPLING: DATE	TIME
176440	Dup	1	40 mL	X										X			8/3	11:09 am

ANALYSIS REQUEST
(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	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					Turn Around Time if different from standard	Hold
			X																	

Relinquished by: Linda Riggins Date: 8/3 Time: 11:37am
Received by: Date: Time: 11:37

Relinquished by: Date: Time:
Received by: Date: Time:

Relinquished by: Date: Time: 8/3/01 16:00
Received at Laboratory by: Jennifer Schmidt Date: 8/4/01 Time: 11:00

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

LAB USE ONLY

Intact Y / N
Headspace Y / N
Temp 4°
Log-in Review MS 8/4/01

Carrier # ~~FedEx~~ UPS 1Z3124XW44 4352

REMARKS: 8/23/01

Summary Report

Fred V. Small
Terracon
1630 Hickory Loop Suite H
Las Cruces, NM 88005

Report Date: January 2, 2002

Order ID Number: A01121816

Project Number: 68997611
Project Name: Huntsman
Project Location: Sunland Park, NM

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
187325	MW-15	Water	12/13/01	12:43	12/17/01
187326	MW-4	Water	12/13/01	13:36	12/17/01
187327	MW-14	Water	12/13/01	14:23	12/17/01
187328	MW-7	Water	12/13/01	14:58	12/17/01
187329	MW-9S	Water	12/14/01	12:10	12/17/01
187330	MW-6D	Water	12/14/01	13:23	12/17/01
187331	MW-6S	Water	12/14/01	13:23	12/17/01
187332	MW-3D	Water	12/14/01	13:48	12/17/01
187333	MW-3S	Water	12/14/01	14:50	12/17/01
187334	RIV-01D	Water	12/14/01	15:28	12/17/01
187335	RIV-01U	Water	12/14/01	15:34	12/17/01
187336	Dup-01	Water	12/14/01	:	12/17/01
187337	Dup-02	Water	12/14/01	:	12/17/01

This report consists of a total of 1 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)
187325 - MW-15	<0.005	<0.005	<0.005	<0.005	<0.005
187326 - MW-4	0.0546	0.0018	<0.001	<0.001	0.0564
187327 - MW-14	0.0011	<0.001	<0.001	<0.001	0.0011
187328 - MW-7	<0.001	<0.001	<0.001	<0.001	<0.001
187329 - MW-9S	0.0029	0.002	<0.001	0.0019	0.0068
187330 - MW-6D	0.0011	<0.001	<0.001	<0.001	0.0011
187331 - MW-6S	<0.005	<0.005	<0.005	<0.005	<0.005
187332 - MW-3D	<0.001	<0.001	<0.001	<0.001	<0.001
187333 - MW-3S	<0.001	<0.001	<0.001	<0.001	<0.001
187334 - RIV-01D	<0.001	<0.001	<0.001	<0.001	<0.001
187335 - RIV-01U	<0.001	<0.001	<0.001	<0.001	<0.001
187336 - Dup-01	0.124	0.002	0.0011	<0.001	0.127
187337 - Dup-02	0.002	<0.001	<0.001	<0.001	0.002

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

Fred V. Small
Terracon
1630 Hickory Loop Suite H
Las Cruces, NM 88005

Report Date: January 2, 2002

Order ID Number: A01121816

Project Number: 68997611
Project Name: Huntsman
Project Location: Sunland Park, NM

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
187325	MW-15	Water	12/13/01	12:43	12/17/01
187326	MW-4	Water	12/13/01	13:36	12/17/01
187327	MW-14	Water	12/13/01	14:23	12/17/01
187328	MW-7	Water	12/13/01	14:58	12/17/01
187329	MW-9S	Water	12/14/01	12:10	12/17/01
187330	MW-6D	Water	12/14/01	13:23	12/17/01
187331	MW-6S	Water	12/14/01	13:23	12/17/01
187332	MW-3D	Water	12/14/01	13:48	12/17/01
187333	MW-3S	Water	12/14/01	14:50	12/17/01
187334	RIV-01D	Water	12/14/01	15:28	12/17/01
187335	RIV-01U	Water	12/14/01	15:34	12/17/01
187336	Dup-01	Water	12/14/01	:	12/17/01
187337	Dup-02	Water	12/14/01	:	12/17/01

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 9 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: 187325 - MW-15

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

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		0.404	mg/L	5	0.10	81	72 - 128
4-BFB		0.424	mg/L	5	0.10	85	72 - 128

Sample: 187326 - MW-4

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0546	mg/L	1	0.001
Toluene		0.0018	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		0.0564	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	72 - 128
4-BFB		0.0885	mg/L	1	0.10	88	72 - 128

Sample: 187327 - MW-14

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0011	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		0.0011	mg/L	1	0.001

Continued ...

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0781	mg/L	1	0.10	78	72 - 128
4-BFB		0.0758	mg/L	1	0.10	76	72 - 128

Sample: 187328 - MW-7

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

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		0.0835	mg/L	1	0.10	84	72 - 128
4-BFB		0.0847	mg/L	1	0.10	85	72 - 128

Sample: 187329 - MW-9S

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0029	mg/L	1	0.001
Toluene		0.002	mg/L	1	0.001
Ethylbenzene		<0.001	mg/L	1	0.001
M,P,O-Xylene		0.0019	mg/L	1	0.001
Total BTEX		0.0068	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[1]	0.051	mg/L	1	0.10	51	72 - 128
4-BFB	[2]	0.0538	mg/L	1	0.10	53	72 - 128

Sample: 187330 - MW-6D

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.0011	mg/L	1	0.001

Continued ...

[1]Low surrogate recovery due to prep error. ICV,CCV, CCV show the method to be in control.
[2]Low surrogate recovery due to prep error. ICV,CCV, CCV show the method to be in control.

... Continued Sample: 187330 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		0.0011	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT	[3]	0.0578	mg/L	1	0.10	57	72 - 128
4-BFB	[4]	0.0581	mg/L	1	0.10	58	72 - 128

Sample: 187331 - MW-6S

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

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		0.406	mg/L	5	0.10	81	72 - 128
4-BFB		0.397	mg/L	5	0.10	79	72 - 128

Sample: 187332 - MW-3D

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

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		0.076	mg/L	1	0.10	76	72 - 128
4-BFB		0.0755	mg/L	1	0.10	76	72 - 128

[3]Low surrogate recovery due to prep error. ICV,CCV, CCV show the method to be in control.
[4]Low surrogate recovery due to prep error. ICV,CCV, CCV show the method to be in control.

Sample: 187333 - MW-3S

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

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		0.0825	mg/L	1	0.10	82	72 - 128
4-BFB		0.0819	mg/L	1	0.10	82	72 - 128

Sample: 187334 - RIV-01D

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

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		0.0855	mg/L	1	0.10	86	72 - 128
4-BFB		0.087	mg/L	1	0.10	87	72 - 128

Sample: 187335 - RIV-01U

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

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		0.0879	mg/L	1	0.10	88	72 - 128
4-BFB		0.0881	mg/L	1	0.10	88	72 - 128

Sample: 187336 - Dup-01

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16694	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16546	Date Prepared:	12/18/01

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.124	mg/L	1	0.001
Toluene		0.002	mg/L	1	0.001
Ethylbenzene		0.0011	mg/L	1	0.001
M,P,O-Xylene		<0.001	mg/L	1	0.001
Total BTEX		0.127	mg/L	1	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.0851	mg/L	1	0.10	85	72 - 128
4-BFB		0.0869	mg/L	1	0.10	87	72 - 128

Sample: 187337 - Dup-02

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC16695	Date Analyzed:	12/18/01
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB16547	Date Prepared:	12/18/01

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		0.099	mg/L	1	0.10	99	72 - 128
4-BFB		0.084	mg/L	1	0.10	84	72 - 128

Quality Control Report
Method Blank

Method Blank QCBatch: QC16694

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: QC16695

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

Laboratory Control Spikes QCBatch: QC16694

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.0956	0.0948	mg/L	1	0.10	<0.001	96	1	80 - 120	20
Benzene	0.0911	0.0928	mg/L	1	0.10	<0.001	91	2	80 - 120	20
Toluene	0.0919	0.0929	mg/L	1	0.10	<0.001	92	1	80 - 120	20
Ethylbenzene	0.0926	0.0933	mg/L	1	0.10	<0.001	93	1	80 - 120	20
M,P,O-Xylene	0.275	0.276	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	0.0874	0.0816	mg/L	1	0.10	87	82	72 - 128
4-BFB	0.0881	0.0831	mg/L	1	0.10	88	83	72 - 128

Laboratory Control Spikes QCBatch: QC16695

Continued ...

... Continued

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.131	0.097	mg/L	1	0.10	<0.001	131	29	80 - 120	20
Benzene	0.098	0.097	mg/L	1	0.10	<0.001	98	1	80 - 120	20
Toluene	0.093	0.095	mg/L	1	0.10	<0.001	93	2	80 - 120	20
Ethylbenzene	0.098	0.096	mg/L	1	0.10	<0.001	98	2	80 - 120	20
M,P,O-Xylene	0.301	0.29	mg/L	1	0.30	<0.001	100	3	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	0.096	mg/L	1	0.10	100	96	72 - 128
4-BFB	0.112	0.095	mg/L	1	0.10	112	95	72 - 128

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC16694

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0902	90	85 - 115	12/18/01
Benzene		mg/L	0.10	0.0897	90	85 - 115	12/18/01
Toluene		mg/L	0.10	0.0887	89	85 - 115	12/18/01
Ethylbenzene		mg/L	0.10	0.0893	89	85 - 115	12/18/01
M,P,O-Xylene		mg/L	0.30	0.264	88	85 - 115	12/18/01

CCV (2)

QCBatch: QC16694

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	12/18/01
Benzene		mg/L	0.10	0.092	92	85 - 115	12/18/01
Toluene		mg/L	0.10	0.091	91	85 - 115	12/18/01
Ethylbenzene		mg/L	0.10	0.091	91	85 - 115	12/18/01
M,P,O-Xylene		mg/L	0.30	0.269	89	85 - 115	12/18/01

ICV (1)

QCBatch: QC16694

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.0931	93	85 - 115	12/18/01
Benzene		mg/L	0.10	0.0924	92	85 - 115	12/18/01
Toluene		mg/L	0.10	0.0928	93	85 - 115	12/18/01
Ethylbenzene		mg/L	0.10	0.0936	94	85 - 115	12/18/01
M,P,O-Xylene		mg/L	0.30	0.277	92	85 - 115	12/18/01

CCV (1) QCBatch: QC16695

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.103	103	85 - 115	12/18/01
Benzene		mg/L	0.10	0.111	111	85 - 115	12/18/01
Toluene		mg/L	0.10	0.105	105	85 - 115	12/18/01
Ethylbenzene		mg/L	0.10	0.097	97	85 - 115	12/18/01
M,P,O-Xylene		mg/L	0.30	0.306	102	85 - 115	12/18/01

CCV (2) QCBatch: QC16695

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	12/18/01
Benzene		mg/L	0.10	0.101	101	85 - 115	12/18/01
Toluene		mg/L	0.10	0.101	101	85 - 115	12/18/01
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	12/18/01
M,P,O-Xylene		mg/L	0.30	0.306	102	85 - 115	12/18/01

ICV (1) QCBatch: QC16695

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.103	103	85 - 115	12/18/01
Benzene		mg/L	0.10	0.102	102	85 - 115	12/18/01
Toluene		mg/L	0.10	0.105	105	85 - 115	12/18/01
Ethylbenzene		mg/L	0.10	0.104	104	85 - 115	12/18/01
M,P,O-Xylene		mg/L	0.30	0.31	103	85 - 115	12/18/01

Page ____ of ____

701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

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 # A0112181G

npany Name: TETRA CON
Phone #: (505) 527-1700
ress: (Street, City, Zip) 1630 HICKORY LOOP, SUITE H, LAS CRUCES, NM 88005
Fax #: (505) 527-1092
tact Person: FRED SMALL / VICTORIA TRUJILLO
ice to: (if different from above)
ect #: 68997611
Project Name: HUNTSMAN, BRICKYARD
ect Location: SUNLAND PARK, NEW MEXICO
Sampler Signature: Victoria Trujillo - REFINERY

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	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	Turn Around Time if different from standard	Hold
7325	MW-15	2	40ml	X				X				X		12/13	12:43		X															
26	MW-4	2	40ml	X				X				X		12/13	1:36		X															
27	MW-14	2	40ml	X				X				X		12/13	2:23		X															
28	MW-7	2	40ml	X				X				X		12/13	2:58		X															
29	MW-9D 9S on label	2	40ml	X				X				X		12/14	12:10		X															
30	MW-6D	2	40ml	X				X				X		12/14	1:23		X															
31	MW-6S	2	40ml	X				X				X		12/14	1:48		X															
32	MW-3D 1/2	2	40ml	X				X				X		12/14	2:50		X															
33	MW-3S	2	40ml	X				X				X		12/14	3:15		X															
34	RIV-01D	2	40ml	X				X				X		12/14	3:28		X															
35	RIV-01U	2	40ml	X				X				X		12/14	3:34		X															

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Victoria Trujillo				12/17/01	11:55
Relinquished by:	Date:	Time:	Received by:	Date:	Time:
Relinquished by:	Date:	Time:	Received at Laboratory by: Vicki Venus	Date: 12/18/01	Time: 10:00

LAB USE ONLY
Intact Y / N
Headspace Y / N
Temp 6 °
Log-in Review MM

REMARKS: 12/20/01

☐ Check If Special Reporting Limits Are Needed

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

Page ____ of ____

5701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

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 # AD1121816

Company Name: TETRACON
Phone #: (505) 527-1700
Address: (Street, City, Zip) 4630 Hickory Loop, Suite H, Las Cruces, NM 88005
Fax #: (505) 527-1092
Contact Person: FRED SMALL / VICTORIA TRUJILLO
Invoice to: (if different from above)
Project #: 68997611
Project Name: HUNTSMAN BRICKLAND Refinery
Project Location: BRICKLAND PARK, NEW MEXICO
Sampler Signature: Victoria Trujillo

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
73,36	DUP-01	2	40ml	X				X				X		12/13	
37	DUP-02	2	40ml	X				X				X		12/13	

ANALYSIS REQUEST
(Circle or Specify Method No.)

MTBE 8021B/602	BTEX 8021B/602	TPH 418.1/TX1005	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	Turn Around Time if different from standard	Hold
	X															
	X															

Relinquished by: Victoria Trujillo Date: Time:
Received by: Date: 12/17/01 Time: 1155
Relinquished by: Date: Time:
Received by: Date: Time:
Relinquished by: Date: Time:
Received at Laboratory by: Vicki Reuse Date: 12-18-01 Time: 10:00

LAB USE ONLY
Intact Y N
Headspace Y / N
Temp 6.6 °
Log-In Review MS

REMARKS:

☐ Check If Special Reporting Limits Are Needed

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

112 P06 NOV 22 '99 11:49
XITECH INSTRUMENTS
5058670212

ADJ 1000 Smart Skimmer
&
2500ES Electronic Timer
Operations Manual

Caution:

Read rules for safe operation and instructions carefully.

© Copyright 1993 REV 9-99

XITECH Instruments, Inc.

06 Camino De Los Desmontes, Placitas, New Mexico 87043
505-867-0008 505-867-0212
WEB SITE: xitechinc.com E Mail: xitechinc@xitechinc.com

LIMITED WARRANTY

This product is warranted to the original purchaser to be free from defective materials and workmanship. Under this warranty the product will be repaired or replaced at our option, without charge for parts or labor.

This warranty does not apply to the ADJ 1000 Skimmer Hydrophobic filter, air logic valve, or diaphragm.

The period of this warranty covers 3 year on parts and labor from date of original purchase.

This warranty entitles the original purchaser to have the warranted parts and labor rendered at no cost for the period of the warranty described above when the instrument is carried or shipped, prepaid to our factory together with proof of purchase.

RULES FOR SAFE OPERATION

1. **Please review carefully and abide by the maximum limits placed on each type of equipment.**
2. **Please follow standard electrical practices and safety precautions when installing AC or DC power to our products.**

XITECH INSTRUMENTS 5058670212 112 P07 NOV 22 '99 11:49

Product Recovery System Installation

The system in figure 1 relates to floating hydrocarbon recovery in wells four inches in diameter and larger. This system includes: an intrinsically safe ADJ 1000 pneumatic skimmer which removes only product to a sheen up to 200 feet deep, a three function electronic timer Model 2500ES that operates the ADJ1000 skimmer intermittently, and an electronic high level tank shutoff sensor assembly.

STEP 1. Mount electronic timer (Model 2500ES) in a vertical position near the air source, power source, and holding tank if possible. CAUTION: The standard electronic timer is NOT intrinsically safe. If this timer must operate in a CLASS I area, the XITECH CLASS I timer will be required. Air supply needs to be free of WATER and OIL to have minimum maintenance. NOTE: The ON/OFF switch inside the timer is for AC and DC power. There is a fuse inside the timer for the AC and DC power.

STEP 2. Install holding tank shutoff assembly into holding tank (a 2" standard pipe inlet will be required in the holding tank). The level of product in the holding tank can be set by raising or lowering the liquid level sensor attached to the rod. Wire the sensor cable into the timer (Figure 3). NOTE: If additional signal cable is needed to position the holding tank assembly further away from the timer, use three conductor wires.

STEP 3. Attach power line from the battery or AC Line to the timer (Figure 3). Turn on the timer power switch. The Product Tank Full light will turn RED for a moment then turn GREEN for a moment, and finally go to a BLINKING GREEN light if the tank sensor is working properly. A RED light at the"Product Tank Full" window indecates you have a problem with the tank sensor or the power source. Turn off the power switch and re-check the sensor wiring and the power source.

ADJ 1000 Smart Skimmer and 2500ES Electronic Timer with Tank Shut-off

Without the use of AC power

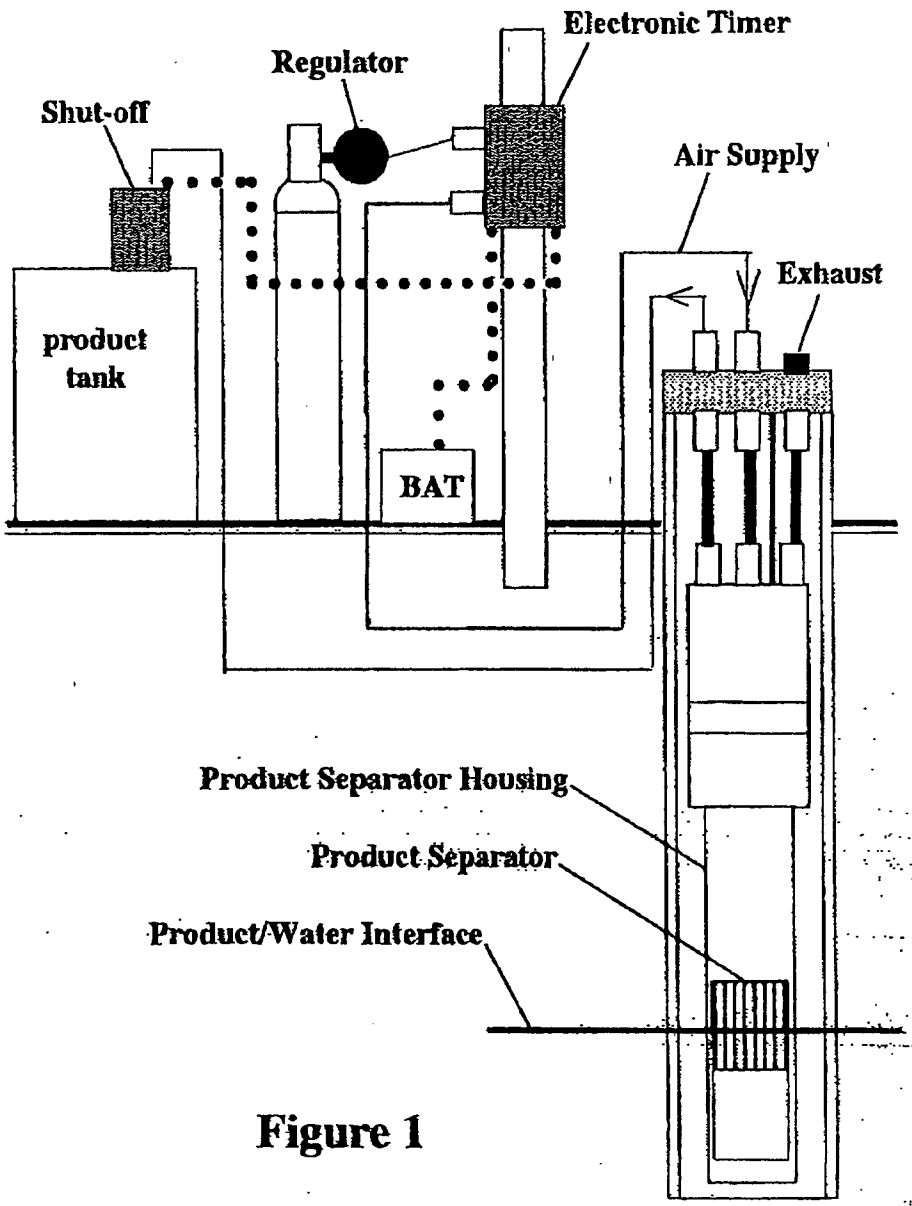


Figure 1

XITECH INSTRUMENTS 5058670212 NOV 22 '99 11:50 112 P08

If the RED light continues to stay on, call the factory. If you plan to operate this system for a long period of time on a battery, we suggest you use a solar panel (see Page 9 for installation) to maintain power in the battery. TURN OFF the power at this time.

STEP 4. Install 1/2"OD air supply tubing from the main air source (bottled gas or air compressor) to the INLET of the Timer. Do NOT apply air pressure YET.

STEP 5. Cut a length of 1/2"OD tubing to cover the distance from the timer OUTLET over to the well cap, down to the top of the skimmer, plus a few extra feet for a droping water table. NOTE: To Position the skimmer at the optimum depth. Allow enough tubing down the well to position the CENTER of the skimmer's slotted well screen at the PRODUCT/WATER interface if the product thickness is less than 2 feet, If the product thinkness is greater than 2 feet then position the CENTER of the skimmer's slotted well screen at least 2 feet below top of product.

STEP 6. Position the skimmer and well cap on the ground near the well. Install the 1/2"OD air supply tubing from the timer OUTLET over to the well cap tube fitting labeled "G"(Figure 2). Slide enough tubing through the well cap to position the skimmer at the PRODUCT/WATER interface (see above). Attach the end of the tubing to the skimmer tube fitting labeled "G". Try not to kink the tubing. Kinks weaken the tubing.

STEP 7. Apply 70 psi of air pressure to the timer. Turn the pumping time knob on the timer to the "CONT" position and turn on the power. The skimmer should start pumping. Apply a bubble solution to all connetions to check for leaks. NOTE: This leak check is very important if you plan to use bottled gas as the air source. Adjust the air pressure to desired operating level.

$$\text{AIR PRESSURE} = 35 + \frac{\text{Total Vertical Lift}}{2.85}$$

Minimum operating pressure is 35 PSI
Maximum operating pressure is 125 PSI

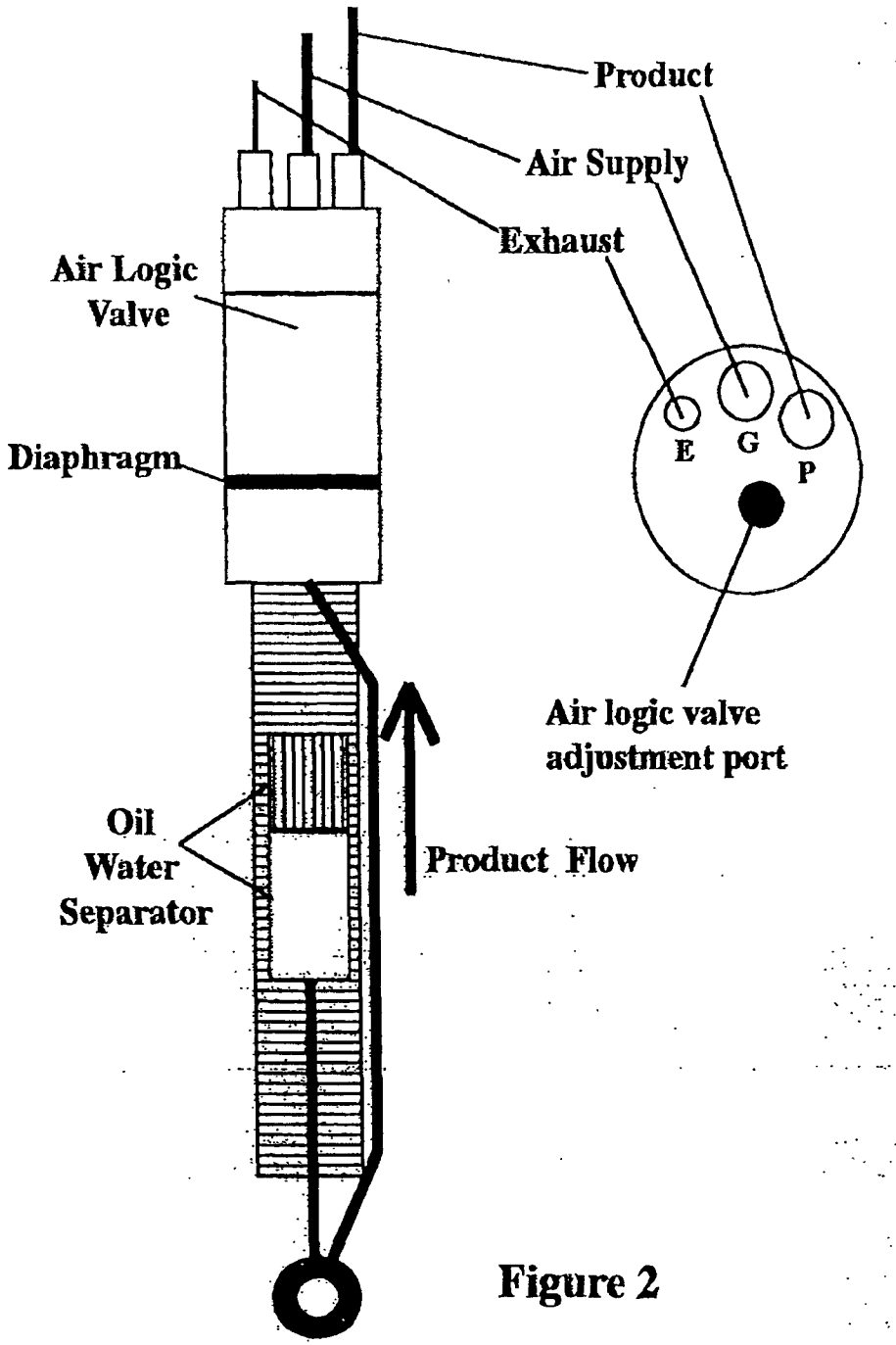


Figure 2

NOV 22 '99 11:50
112 P09
XITECH INSTRUMENTS
5058670212

2500ES Electronic Timer

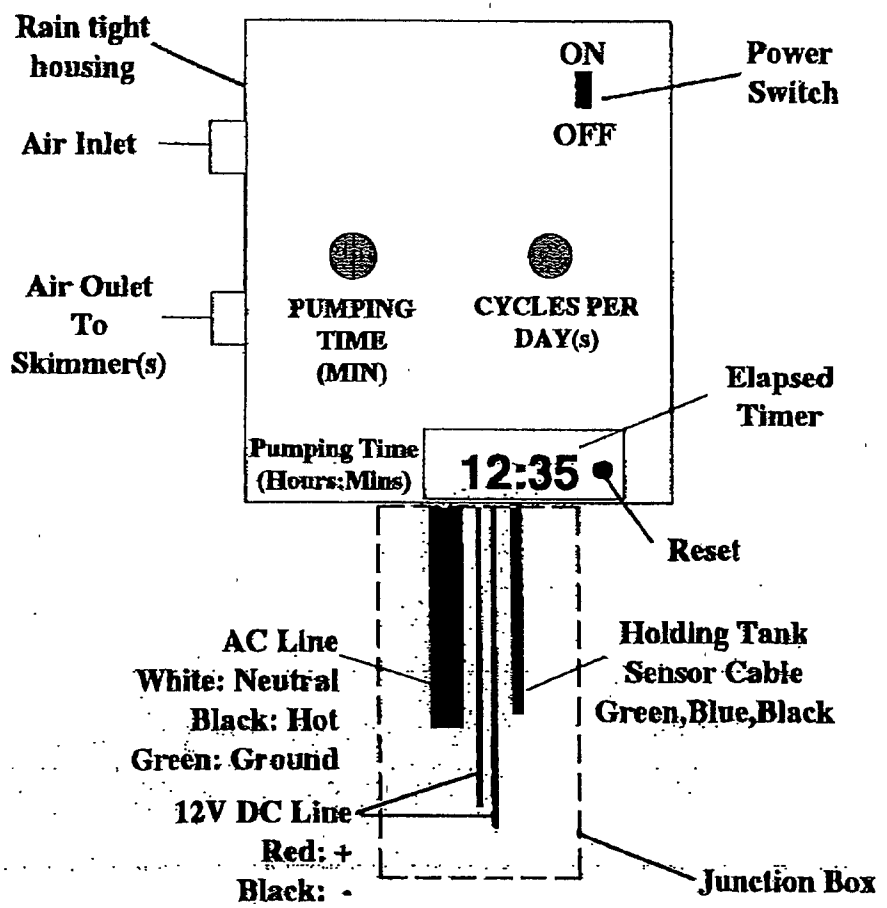


Figure 3

STEP 8. While skimmer is running at desired operating air pressure above ground, confirm and/or adjust skimmer pulse rate. To adjust skimmer pulse rate, remove small plug at the top of the skimmer pump head and insert a small flat-head screwdriver into the air logic valve located inside pump head. Turn clockwise to decrease pulse rate. NOTE: Factory sets skimmer pulse rate to 70 pulses per minute at 50 psi operating pressure. Maximum recommended pulse rate is 80 pulses per minute. Lower pulse rates will consume less air.

THE AIR SUPPLY IS NOW READY FOR USE. TURN THE TIMER POWER SWITCH TO OFF FOR NOW.

STEP 9. Cut a length of 1/2"OD tubing for the product line to cover the distance from the holding tank shut-off assembly over to the well cap, down to the top of the skimmer, plus a few extra feet for up & down adjustments of the water interface. NOTE: Use the same distance from the top of the well to the top of the skimmer as the air supply line.

STEP 10. Cut a length of 7/8"ID neoprene tubing to cover the distance from the holding tank shut-off assembly over to where the product line goes below ground or to the well cap. NOTE: This tubing only needs to cover the ABOVE ground portion of product line.

STEP 11. Slide 7/8"ID tubing over 1/2"OD tubing end which attaches to the holding tank shut-off assembly. Attach both tubes to the holding tank shut-off assembly. Place a hose clamp around the 7/8"ID tube to ensure leak tightness. Run 1/2"OD product line over to well cap tube fitting labeled "P". Slide enough tubing through the well cap to equal the air supply line. Attach the end of this tubing to the skimmer tube fitting labeled "P".

STEP 12. Cut a length of 3/8"OD tubing for the air exhaust line to cover the distance from the top of the well cap to the top of the skimmer, plus a few feet for up&down adjustments of the water interface.

5058670212 XITECH INSTRUMENTS 113 P01 NOV 22 '99 11:52

STEP 13. Install 3/8"OD air exhaust tubing through the well cap tube fitting labeled "E" on to the skimmer tube fitting labeled "E".

STEP 14. Attach a safety cable from inside the well cap to the top of the skimmer pump head. Be sure to leave 3-4 feet of slack in the cable. The tubing will carry the weight of the skimmer.

YOU ARE NOW READY TO PLACE THE SKIMMER INTO THE WELL.

STEP 15. Turn on the power switch at the timer and turn the Pumping Time knob to the CONT. position to start the skimmer running. Hold the skimmer in an upright position and check that the yellow hose at the bottom of skimmer is not twisted. Now slowly lower the skimmer into the well.

Operation of the Product Recovery System

STEP 1. With the skimmer and timer installation complete, reset the digital timer to 0-00. You should notice that the skimmer is running by feeling air pulses coming from the 3/8"OD exhaust port at the top of the well cap. The Digital Readout should have a blinking "-" which indicates that the totalizing timer is running. To confirm the skimmer is pumping place the discharge line in a cup of water. If the simmer is working properly, you will see a bubble for each air exhaust pluse.

STEP 2. Observe the product being discharged by the skimmer. Be sure no water is being pumped.

STEP 3. Record the amount of time it takes to empty the well of product. When the well is empty of product, turn off the timer power. Remove the skimmer from the well and record the amount of time it takes for the product to fully recover to the original static level.

NOW SET THE TIMER INTERMITTENT SKIMMING.

STEP 4. If you found that it took 10 minutes to pump the well dry of product and 2 hours for the product to return to static level after the skimmer was turned off, and then set the "pumping time" to 10 minutes and the "cycles per day" to 12 cycles per day, as a starting point.

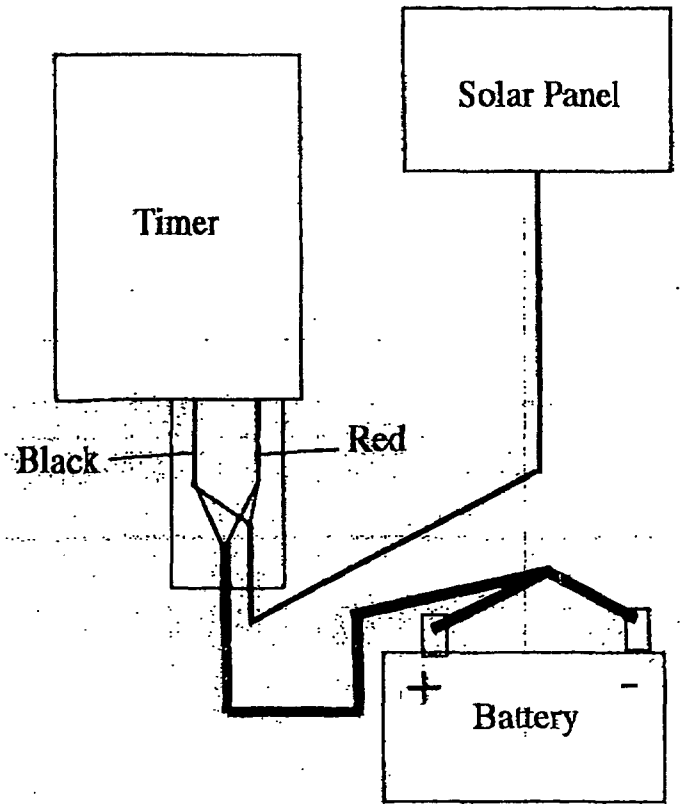
NOTE: Timing begins when power is applied. The settings ending with a "D" means days delay. For example: If the "cycles per day" is set to 5D and you turn on the power to the timer, the timer will immediatly operate the skimmer for the sellected amount of pumping time and then wait 5 days before running the skimmer again.

FINAL NOTE: Keep in mind that you are trying to obtain a desired balance between air consumption, how often you have to empty the product tank, and and total product recovery. The timer is the best place to make your adjustments to extablish this balance.

NOV 22 '99 11:53
113 P02
XITECH INSTRUMENTS
5058670212

Solar Panel Installation

1. Attach solar panel to the solar panel bracket and then to pole above the Electronic Timer.
2. Remove the lower junction box plate from the timer. Take the battery cable end (without the clips) and insert thru opening in bottom of junction box. Take solar panel cable end and also insert thru same opening in bottom of junction box. Attach red wires from the solar panel cable, battery cable, and the timer together with the yellow wire nut provided. Attach black wires from the solar panel cable, battery cable, and the timer together with the yellow wire nut provided.
3. Attach the red power cable battery clip to the positive terminal on the battery and the black power cable battery clip to the negative terminal on the battery.

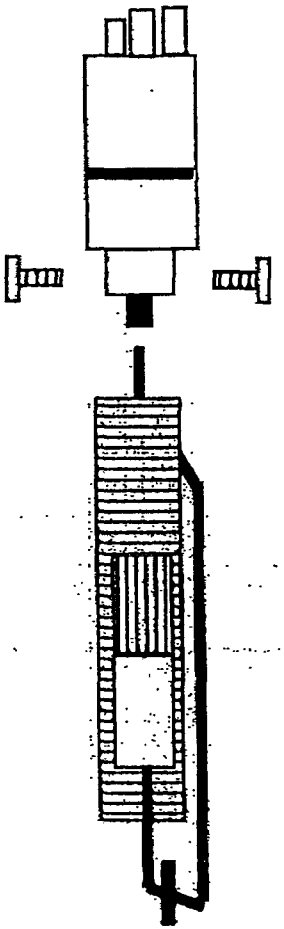


Removing The Skimmer Assembly From The Pump

1. Remove the two bolts that secure the skimming housing to the pump. Remove the lower tubing strap at the bottom of the skimmer.

2. Separate the skimming housing from the pump by feeding the black product tubing that runs along the outside of the well screen up into the well screen.

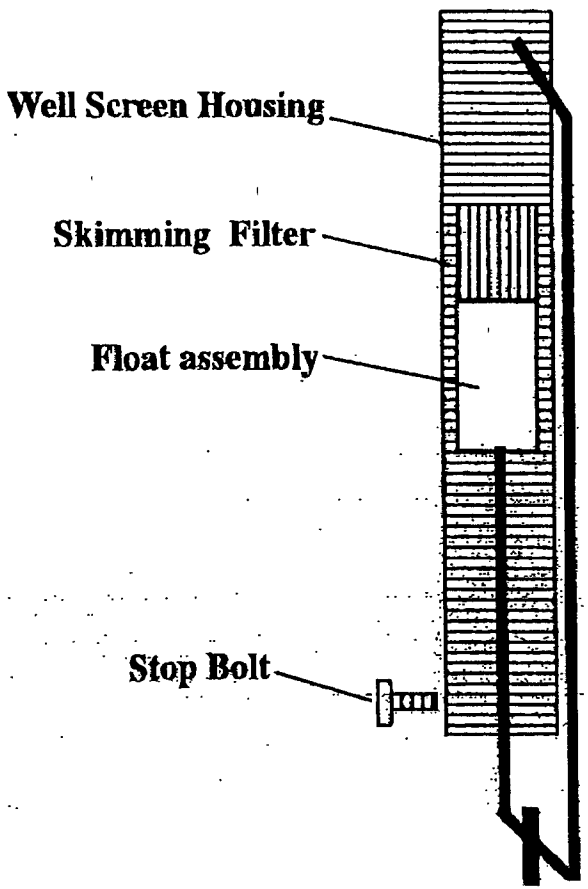
3. Compress the release collar on the tubing fitting to free the product tubing from the fitting.



5058670212 XITECH INSTRUMENTS 113 P03 NOV 22 '99 11:54

Replacing The Skimming Filter

1. Remove the stop bolt at the bottom of the well screen housing.
2. Remove the skimming assembly from the well screen housing.
3. Remove the skimming filter by pulling off of the float assembly. No tools required.
4. Push on a new skimming filter onto the float assembly and return skimming assembly to the well screen housing.
5. Secure the stop bolt to the well screen housing.



Replacing The Skimmer Diaphragm

1. Loosen all bolts until pump bottom can be detached. Do not separate pump head, valve housing, or diaphragm from the six bolts at this time.
2. Lay pump on it's side on the table and remove the diaphragm from all six bolts.
3. Place new diaphragm onto the six bolts and reattach upper pump parts with the pump bottom.