GW - 21

MONITORING REPORTS

DATE:
2010

ARCADIS
Infrastructure, environment, buildings

GW-21

ARCADIS U.S., Inc.
1004 North Big Spring Street
Suite 300
Midland
Texas 79701
Tel 432.687.5400
Fax 432.687.5401
www.arcadis-us.com

Mr. Edward J. Hansen
New Mexico Energy, Minerals & Natural Resources Department
Oil Conservation Division, Environmental Bureau
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

ENVIRONMENTAL

Subject:
Submittal of 2010 Annual Groundwater Monitoring Report
Indian Basin Gas Plant
Eddy County, New Mexico

Date:
August 31, 2010

Mr. Hansen:

On behalf of OXY USA WTP Limited Partnership, ARCADIS is submitting the attached Annual Groundwater Monitoring Report for the Indian Basin Gas Plant (site) located in Eddy County, New Mexico. The New Mexico Oil Conservation Division (OCD) requires groundwater monitoring of 15 wells at the site and submittal of an annual report documenting the groundwater monitoring activities.

If you should have any questions, please contact me at (432) 687-5400.

Sincerely,

ARCADIS U.S., Inc.

Alan J. Reed, Jr.
Project Manager

Contact:
Alan J. Reed, Jr.

Phone:
(432) 687-5400

Email:
alan.reed@arcadis-us.com

Copies:
Jon Hamill, HES Superintendent, OXY USA WTP Limited Partnership
Mark Treesh, IBGP Production Coordination, OXY USA WTP Limited Partnership

ARCADIS

2010 Annual Groundwater Monitoring Report

Indian Basin Gas Plant
Eddy County, New Mexico

Alan J. Reed, Jr., P.E.
Project Manager

Steven P. Tischer
Site Evaluation & Remediation Department Manager

Prepared for:
OXY USA WTP Limited Partnership

Prepared by:
ARCADIS U.S., Inc.
1004 N. Big Spring
Suite 300
Midland
Texas 79701
Tel 432.687.5400
Fax 432.687.5401

Our Ref.:
MT001016.0003.00001

Date:
26 August 2010

Tables

Figures

Appendices

Executive Summary

The Indian Basin Gas Plant (site) is located approximately 20 miles northwest of Carlsbad in Eddy County, New Mexico. Remediation efforts at the site, collectively known as the Indian Basin Remediation Project (IBRP), were initiated in April 1991 to recover free-phase petroleum hydrocarbons related to the release of a liquid by-product of natural gas production known as "condensate". The subsurface at the site includes two distinct geologic zones referred to as the "Shallow Zone" and the "Lower Queen". Both of these zones contain saturated and unsaturated strata. Prior to March 2003, there were a total of 150 wells and two shallow sumps present at the site related to the IBRP. However, with New Mexico Oil Conservation District (NMOCD) approval, 39 Shallow Zone wells were plugged and abandoned in March 2003, reducing the well total to 111 wells and two sumps. The remaining wells and two sumps were used for a combination of groundwater monitoring, groundwater and condensate recovery, treated groundwater infiltration and condensate vapor extraction.

In May 2008, a report titled *Evaluation of Natural Attenuation, Indian Basin Remediation Project, Eddy County, New Mexico* was submitted to the NMOCD. The report described the natural attenuation processes occurring at the site and recommended closure of the IBRP. A letter with the reference title *Proposed Indian Basin Remediation Project Well Plugging Program* was subsequently submitted to the NMOCD in February 2009. The NMOCD responded to the May 2008 report and February 2009 plugging program letter in correspondence dated February 20, 2009. In the February 20, 2009 correspondence, the NMOCD stated that the report and well plugging request were substantially acceptable, and conditionally approved the discontinuance of active remediation at the site. However, the NMOCD required at least annual groundwater monitoring for BTEX, TDS and chloride for a total of 15 wells, and semi-annual gauging of depth to groundwater and non-aqueous phase liquid thickness. In addition, an annual groundwater monitoring report must be submitted to the NMOCD.

In March and April 2009, a total of 95 wells (including the two shallow sumps) were plugged and abandoned. Three water supply wells (SW-1, SW-2 and SW-3) originally included in the proposed plugging program were not plugged, because they are needed to supply water for site operations. A report documenting the well plugging activities was submitted to the NMOCD in June 2009. The NMOCD approved the plugging report through email correspondence dated June 17, 2009.

The 2010 annual groundwater monitoring event was conducted from June 21-24, 2010, and included the gauging of depth to groundwater and non-aqueous phase liquid thickness of 15 monitoring wells (seven in the Shallow Zone and eight in the Lower

Queen) and sampling of monitoring wells for BTEX, TDS and chloride. This report documents the results from the June 2010 annual groundwater monitoring event and provides historical groundwater monitoring documentation.

Liquid-level measurements obtained from each well in June 2010 and the surveyed well elevations were used to calculate groundwater elevations, with density corrections to the water level where condensate was present. The resulting elevation data were used to generate groundwater piezometric contour maps for the Shallow Zone and Lower Queen aquifers. Review of these maps and the elevation data indicate Shallow Zone and Lower Queen groundwater flow was generally consistent with patterns observed in previous years. Flow in the Shallow Zone is to the southeast at an approximate gradient of 0.0146 ft/ft, and flow in the Lower Queen is generally to the northwest at an approximate gradient of 0.0003 ft/ft.

In June 2010, groundwater samples were collected from six Shallow Zone monitoring wells (MW-14, MW-45, MW-46, MW-49, MW-77 and MW-106) and five Lower Queen monitoring wells (MW-66, MW-70, MW-88, MW-111 and MW-127). Samples were not collected from Shallow Zone monitoring well MW-126 and the Lower Queen monitoring wells MW-58, MW-81 and MW-113, because they contained condensate. The analytical results indicate that BTEX concentrations in the sampled Shallow Zone monitoring wells were below NMOCD regulatory limits with the exception of benzene in MW-49. The benzene concentration of 24 ug/L in MW-49 was within historical levels. In addition, BTEX concentrations in all five of the sampled Lower Queen wells were below NMOCD regulatory limits. In general, TDS and chloride concentrations in the sampled Shallow Zone monitoring wells were within historical levels, and TDS and chloride concentrations in MW-77 and MW-106 were below NMOCD regulatory limits. The TDS and chloride concentrations in the sampled Lower Queen wells were all below NMOCD regulatory limits.

Groundwater monitoring at the site will continue and be conducted according to the requirements outlined in the February 20, 2009 NMOCD letter. Based on the current program schedule, the annual groundwater monitoring event will be conducted in the spring (April / May) and the semi-annual groundwater gauging event will be conducted in the fall (October / November). Annual reports will be prepared at the conclusion of each annual groundwater monitoring event and will be submitted to the NMOCD. The current purging and sampling techniques utilize low-flow procedures that were approved and implemented in 2003.

1. Introduction

ARCADIS has prepared this Annual Groundwater Monitoring report on behalf of OXY USA WTP Limited Partnership (Oxy). This report presents the results of the annual groundwater monitoring event conducted in June 2010, and includes historical groundwater monitoring data from the Indian Basin Remediation Project (IBRP) at the Indian Basin Gas Plant located in Eddy County, New Mexico. This report has been prepared in accordance with the groundwater monitoring requirements outlined in correspondence by the New Mexico Energy, Minerals, and Natural Resources Department, Oil Conservation Division (NMOCD) to Marathon Oil Company dated February 20, 2009.

The following section presents a brief summary of the project background. The remaining sections discuss results from the June 2010 annual groundwater monitoring event and the continuing groundwater monitoring program.

2. Background

The Indian Basin Gas Plant (site) is located approximately 20 miles northwest of Carlsbad, New Mexico, as shown on Figure 1. The site is situated in Township 21 South, Eddy County, and occupies portions of Range 23 East (Sections 13, 23, 24, 25, and 26) and Range 24 East (Sections 19 and 30). Remediation efforts at the site were initiated in April 1991 and were designed to remove separate-phase petroleum hydrocarbons present in the subsurface, primarily condensate, the liquid by-product of natural gas production.

The geology underlying the site is comprised of two distinct zones, both with saturated and unsaturated strata. The geologic units are referred to as the Shallow Zone and the Lower Queen. Prior to March 2003, there were a total of 150 wells (78 Shallow Zone and 72 Lower Queen) and two shallow sumps present at the site related to the IBRP. However, with New Mexico Oil Conservation District (NMOCD) approval, 39 Shallow Zone wells were plugged and abandoned in March 2003, reducing the well total to 111 wells and two shallow sumps. The remaining wells and two sumps were used for a combination of groundwater monitoring, groundwater and condensate recovery, treated groundwater infiltration and condensate vapor extraction.

In May 2008, a report titled *Evaluation of Natural Attenuation, Indian Basin Remediation Project, Eddy County, New Mexico* was submitted to the NMOCD. The report described the natural attenuation processes occurring at the site and recommended closure of the IBRP. In addition, a letter with the reference title *Proposed Indian Basin Remediation Project Well Plugging Program* was submitted to the NMOCD in February

2009. The NMOCD responded to the May 2008 report and February 2009 plugging program letter in correspondence dated February 20, 2009. In the February 20, 2009 correspondence, the NMOCD stated that the report and well plugging request were substantially acceptable, and conditionally approved the discontinuance of active remediation at the site. However, the NMOCD required at least annual groundwater monitoring for BTEX, TDS and chloride for a total of 15 wells, and semi-annual gauging of depth to groundwater and non-aqueous phase liquid thickness. In addition, the NMOCD required that an annual groundwater monitoring report must be submitted. A copy of the NMOCD correspondence is included in Appendix D.

In March and April 2009, a total of 95 wells (including the two shallow sumps) were plugged and abandoned. Three water supply wells (SW-1, SW-2 and SW-3) originally included in the proposed plugging program were not plugged, because they are needed to supply water for site operations. A report documenting the well plugging activities was submitted to the NMOCD in June 2009. The NMOCD approved the plugging report through email correspondence dated June 17, 2009 (Appendix D).

Table 1 lists the 15 wells remaining in the groundwater monitoring program and monitoring requirements. Figure 2 depicts the site layout, including the locations of remaining Shallow Zone and Lower Queen wells. Additional details regarding local and regional geology and hydrogeology are presented in the report titled *Comprehensive Site Characterization Report for the IBRP*, submitted to the OCD in December 1998.

3. Groundwater and Condensate Gauging

The annual groundwater gauging and sampling event was conducted in June 2010. The gauging event consisted of collecting liquid-level measurements from the wells listed in Table 1 for both the Shallow Zone and Lower Queen. The results of the June 2010 gauging event as well as precipitation recharge (rainfall) are discussed in the following sections. A summary of the June 2010 groundwater gauging results is provided in Table 2. Historical groundwater gauging data for the remaining monitoring wells at the site is presented in Appendix A.

3.1 Shallow Zone Aquifer

A total of seven monitoring wells completed in the Shallow Zone were gauged during the June 2010 gauging event. The liquid-level measurements and the top of casing elevations for the wells were then used to calculate the groundwater elevation at each well. Density corrections to the water level were made as required where condensate was present.

Overall, groundwater levels (including density corrections for condensate if present) were near to or at historically low levels for all of the Shallow Zone wells in June 2010. During the June 2010 gauging event, measurable condensate was detected in Shallow Zone monitoring well MW-126. The condensate thickness measured in MW-126 was 0.23 feet. Historically, the condensate thickness in MW-126 has ranged between 0 and 3.96 feet.

A groundwater elevation contour map was prepared based on the June 2010 groundwater elevation measurements (Figure 3). As shown on Figure 3, the observed groundwater flow direction in the Shallow Zone is to the southeast at an approximate gradient of 0.0146 ft/ft. The flow direction and gradient are generally consistent with historical patterns.

3.2 Lower Queen Aquifer

A total of eight monitoring wells completed in the Lower Queen were gauged during the June 2010 gauging event. The liquid-level measurements and the top of casing elevations for the wells were then used to calculate the groundwater elevation at each well. Density corrections to the water level were made as required where condensate was present.

During the June 2010 gauging event, condensate was observed in Lower Queen monitoring wells MW-58, MW-81 and MW-113. Approximately 0.11 feet of condensate was measured in MW-58. Condensate has been frequently observed in MW-58 ranging between 0 and 5.26 feet. The condensate thickness measured in MW-81 was 0.22 feet. Historically, the condensate thickness in MW-81 has ranged between 0 and 12.08 feet. The condensate thickness measured in MW-113 was 0.05 feet. Historically, MW-113 has contained between 0 and 0.88 feet of condensate.

A groundwater elevation contour map was prepared based on the June 2010 groundwater elevation measurements (Figure 5). As shown on Figure 5, the observed groundwater flow direction in the Lower Queen is generally to the northwest at an approximate gradient of 0.0003 ft/ft. The flow direction and gradient are generally consistent with historical patterns.

3.3 Precipitation Recharge

Table 3 summarizes monthly rainfall for the area during 2009 along with historical precipitation since 1994. From 1994 through 2006, the precipitation records are from the Indian Basin Gas Plant. For 2007 through 2009, the precipitation records are from Carlsbad, New Mexico. The site has historically received the highest amounts of

precipitation between the months of June and October. Precipitation generally followed a similar trend during the 2009 calendar year. The average annual rainfall measured over the past five years is approximately 13.80 inches, which is similar to the long-term average for the area of approximately 14 inches per year. During 2009, data from the Carlsbad gauge indicate that the highest amount of precipitation was received in July (6.13 inches) with a total of 11.96 inches reported for the year. The below normal rainfall totals in 2008 and 2009 appear to have contributed to the generally low static water levels in the Shallow Zone wells compared with historical data. In fact, all seven of the June 2010 water levels in the Shallow Zone monitoring wells were near to or below historical low levels based on measurement data in Appendix A. The below normal rainfall totals for 2008 and 2009 also appears to have contributed to significantly lower water levels in six of the eight Lower Queen monitoring wells measured in June 2010. The water levels in Lower Queen monitoring wells MW-58 and MW-81 were near their average levels based on historical data while water levels in monitoring wells MW-66, MW-70, MW-88, MW-111, MW-113 and MW-127 were below historical levels based on measurement data in Appendix A.

4. Groundwater Sampling and Analysis

As a condition of the discontinuance of active remediation at the site, the NMOCD required at least annual groundwater monitoring for BTEX, TDS and chloride for seven Shallow Zone and eight Lower Queen monitoring wells. ARCADIS personnel conducted the 2010 annual groundwater sampling event at the site in June 2010. All samples were collected using low-flow purging and sampling techniques. Trip blanks were collected for this event and submitted for analysis of BTEX. Table 4 summarizes the BTEX, chloride and TDS analytical results for June 2010. Summaries of historical BTEX, TDS and chloride analytical data are presented in Appendix B. The complete laboratory analytical reports for the annual groundwater sampling event in 2010 are presented on a CD-Rom (Appendix C).

The groundwater monitoring analytical results for both the Shallow Zone and Lower Queen are discussed in the following sections.

4.1 Shallow Zone Aquifer

4.1.1 BTEX Analysis

Groundwater samples were collected from six Shallow Zone monitoring wells (MW-14, MW-45, MW-46, MW-49, MW-77 and MW-106) in June 2010. Samples were not collected from MW-126, because it contained condensate. It is important to note that a peristaltic pump was required to purge and sample MW-45. The peristaltic pump was

necessary, because the well had a bend in the casing that prevented access for sample collection by a bladder pump or bailer. The results of the BTEX laboratory analysis of the six Shallow Zone groundwater samples is summarized as follows:

- Monitoring well MW-49 was the only well containing benzene above the NMOCD regulatory limits at a concentration of 24 ug/L. The benzene concentration in MW-49 is consistent with historical data;
- Benzene was detected in MW-14 at a concentration of 1.1 ug/L, but the concentration was below the NMOCD regulatory limit;
- Toluene was not detected either above the laboratory detection limits or the NMOCD regulatory limits in any of the sampled wells;
- Ethylbenzene was only detected in MW-14 at a concentration of 2.9 ug/L, but the concentration was well below the NMOCD regulatory limit; and
- Total xylene was only detected in MW-14 at a concentration of 19.4 ug/L, but the concentration was well below the NMOCD regulatory limit.

Figure 4 illustrates the distribution of dissolved BTEX compounds in the Shallow Zone aquifer in June 2010. As indicated by the historical data in Appendix B, BTEX concentrations in this water-bearing zone have generally remained stable or declined over time. It is important to note that benzene concentrations in MW-14 have continuously declined since condensate was observed in April 2004 to the present dissolved concentration of 1.1 ug/l, which is below the NMOCD regulatory limit.

4.1.2 Wet Chemistry Analysis

In addition to BTEX analysis, groundwater samples collected in June 2010 from the Shallow Zone monitoring wells MW-45, MW-49, MW-77 and MW-106 were analyzed for wet chemistry (TDS and chloride). Monitoring wells MW-14 and MW-46 did not contain an adequate volume of water to collect samples for TDS and chloride. The results of the wet chemistry laboratory analysis of the Shallow Zone monitoring wells in June 2010 are summarized as follows:

- TDS concentrations were detected above the NMOCD standard in both MW-45 and MW-49. The TDS concentration in MW-45 (4,190 mg/L) was higher than in 2009, but within the historical TDS range recorded for this well in the historical database (Appendix B). The TDS concentration in MW-49 (2,650 mg/L) was at the low end of the TDS values reported historically (ranging from 2,600 to 3,960 mg/L);

- TDS concentrations in both MW-77 and MW-106 were below the NMOCD standard and were within historical ranges. The TDS in MW-77 was 545 mg/L, and the TDS in MW-106 was 349 mg/L;

- Chloride concentrations were detected above the NMOCD standard in MW-45 (473 mg/L) and MW-49 (408 mg/L), but the concentrations were within historical ranges reported in the historical database (Appendix B); and

- Chloride concentrations in both MW-77 and MW-106 were below the NMOCD standard and were within historical ranges. The chloride in MW-77 was 48 mg/L and the chloride in MW-106 was 3.12 mg/L.

A summary of the wet chemistry laboratory analysis is provided in Table 4. Copies of the analytical laboratory reports are included in Appendix C. Figure 4 shows TDS and chlorides in the wells sampled in June 2010.

4.2 Lower Queen Aquifer

4.2.1 BTEX Analysis

Groundwater samples were collected from five Lower Queen monitoring wells (MW-66, MW-70, MW-88, MW-111 and MW-127) in June 2010. Samples were not collected from MW-58, MW-81 and MW-113, because they contained condensate. The results of the BTEX laboratory analysis of the five Lower Queen groundwater samples is summarized as follows:

- Benzene was not detected in the any of the Lower Queen samples;
- Toluene was not detected in any of the Lower Queen samples;
- Ethylbenzene was not detected in any of the Lower Queen samples; and
- Total xylene was detected at a concentration of 2.2 ug/L in MW-127, but the concentration was well below the NMOCD regulatory limit. No other Lower Queen monitoring wells contained total xylene above laboratory detection limits.

Figure 6 illustrates the distribution of dissolved BTEX compounds in the Lower Queen in June 2010. Overall, the BTEX concentrations in the Lower Queen were similar to historical data (Appendix B).

4.2.2 Wet Chemistry Analysis

In addition to BTEX analysis, groundwater samples were collected in June 2010 from the Lower Queen monitoring wells MW-66, MW-70, MW-88, MW-111 and MW-127 and analyzed for wet chemistry (TDS and chlorides). The results of the wet chemistry laboratory analysis of the Lower Queen monitoring wells in June 2010 are summarized as follows:

- TDS concentrations were below the NMOCD standard of 1,000 mg/L in all five sampled wells in the Lower Queen. TDS concentrations ranged from 350 mg/L in MW-70 to 919 mg/l in MW-88; and

- Chloride concentrations were below the NMOCD standard of 250 mg/L in all five sampled wells in the Lower Queen. The chloride concentrations ranged from 9.09 mg/L in MW-66 to 70.2 mg/L in MW-111.

A summary of the wet chemistry laboratory analysis is provided in Table 4. Copies of the analytical laboratory reports are included in Appendix C. Figure 6 shows TDS and chlorides in the wells sampled in June 2010.

5. Summary

5.1 June 2010 Groundwater Monitoring Summary

Results from the June 2010 annual groundwater monitoring event indicated similar groundwater conditions at the site as previous reports. Precipitation in 2008 and 2009 was below normal, and likely contributed to limited groundwater recharge in the area, resulting in generally lower water levels in both the Shallow Zone and Lower Queen aquifers. Wells containing measurable condensate in June 2010 were consistent with historical results, and analytical results for BTEX, chloride and TDS were similar to historical data for the sampled wells.

5.2 Groundwater Monitoring Plan

Groundwater monitoring will continue at the Indian Basin Gas Plant in accordance with the requirements outlined in the February 20, 2009 NMOCD letter including at least annual groundwater monitoring for BTEX, TDS and chloride for the seven Shallow Zone and eight Lower Queen monitoring wells at the site, and semi-annual gauging of depth to groundwater and non-aqueous phase liquid thickness. In addition, an annual groundwater monitoring report will be submitted to the NMOCD. Based on the current program schedule, the annual groundwater monitoring event will be conducted in the

spring (April / May) and the semi-annual groundwater gauging event will be conducted in the fall (October / November). Annual reports will be prepared at the conclusion of each annual groundwater monitoring event.

The current purging and sampling techniques utilize low-flow procedures that were approved and implemented in 2003. A copy of the March 1998 USEPA low-flow procedures is included in Appendix E.

ARCADIS

Table 1. Groundwater Monitoring Plan
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico.

Shallow Zone

	Sampling Schedule				
Well ID	Date Spring	annual	Analytical Paramenters annual	Date Fall	semi-annual
MW-14	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-45	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-46	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-49	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-77	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-106	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-126	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging

Lower Queen

	Sampling Schedule				
Well ID	Date Spring	annual	Analytical Paramenters annual	Date Fall	semi-annual
MW-58	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-66	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-70	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-81	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-88	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-111	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-113	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging
MW-127	X	Groundwater Gauging	BTEX, Chloride, TDS	X	Groundwater Gauging

Notes:
TDS Total Dissolved Solids

ARCADIS

Table 2. Summary of Groundwater Gauging Results, June 2010 Annual Groundwater Sampling Event
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico.

Well Number	Well Diameter (in)	Northing NAD 27 Con	Easting hddd,mm',ss.s"	Total Depth From TOC (ft)	Top of Casing (ft amsl)	Top of Casing Stickup (ft agl)	DTW (feet)	DTP (feet)	PT (feet)	PT x 0.73 (feet)	ADJ DTW (feet)	WL Elev (ft amsl)	Comments
Shallow Zone													
MW-14	4	32 27 44.3	104 34 00.9	24.35	3803.61	2.08	24.04					3779.57	
MW-45	2	32 28 01.1	104 34 08.7	26.45	3808.68	1.60	21.52					3787.16	
MW-46	4	32 27 56.7	104 34 05.8	19.90	3805.54	1.90	19.42					3786.12	
MW-49	2	32 27 57.6	104 33 59.9	26.50	3805.61	1.90	22.33					3783.28	
MW-77	7.875	32 27 27.3	104 33 25.0	84.15	3775.48	2.38	80.57					3694.91	
MW-106	4	32 26 57.0	104 32 26.4	94.27	3721.97	2.61	90.06					3631.91	
MW-126	4	32 27 48.2	104 33 49.9	78.10	3796.28	3.33	70.40	70.17	0.23	0.17	70.23	3726.05	condensate, confirmed with bailer
Lower Queen													
MW-58	7.875	32 28 04.5	104 33 28.5	219.48	3824.07	3.48	200.74	200.63	0.11	0.08	200.66	3623.41	condensate, confirmed with bailer
MW-66	4	32 28 19.1	104 33 28.5	232.50	3828.98	2.60	206.82					3622.16	
MW-70	4	32 27 18.8	104 34 05.5	224.71	3822.57	2.71	199.54					3623.03	
MW-81	7.875	32 28 04.3	104 33 19.5	228.98	3817.03	3.98	194.21	193.99	0.22	0.16	194.05	3622.98	condensate, confirmed with bailer
MW-88	4	32 28 25.3	104 32 55.6	177.80	3789.70	2.71	167.28					3622.42	
MW-111	4	32 28 15.9	104 34 06.1	231.85	3824.44	1.85	202.92					3621.52	
MW-113	7.875	32 27 16..3	104 33 32.1	201.82	3772.67	1.82	149.47	149.42	0.05	0.04	149.43	3623.24	condensate, confirmed with bailer
MW-127	8.25	32 28 00.8	104 33 58.8	247.63	3825.17	2.63	203.46					3621.71	

ARCADIS

Table 3. Summary of Historical Rainfall with Monthly Rainfall During 2009
OXY USA WTP Limited Partnership, Indian Basin Gas Plant
Eddy County, New Mexico.

Historical Rainfall

Year	Rainfall (inches)
1994	9.31
1995	7.84
1996	16.60
1997	10.65
1998	3.95
1999	4.70
2000	9.75
2001	6.02
2002	12.70
2003	7.58
2004	26.96
2005	11.16
2006	17.49
2007	19.02*
2008	9.39*
2009	11.96*

Monthly Rainfall During 2009

Month	Rainfall (inches)
January	0.00
February	M
March	0.14
April	0.01
May	0.40
June	1.78
July	6.13
August	0.63
September	0.26
October	1.02
November	0.10
December	1.49
2009 Annual Total	11.96

M - Data missing for this month.

Source: Rain gauge at Indian Basin Gas Plant
* Taken from Carlsbad, NM Station

ARCADIS

Table 4. Summary of Analytical Results, June 2010 Annual Groundwater Sampling Event
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico.

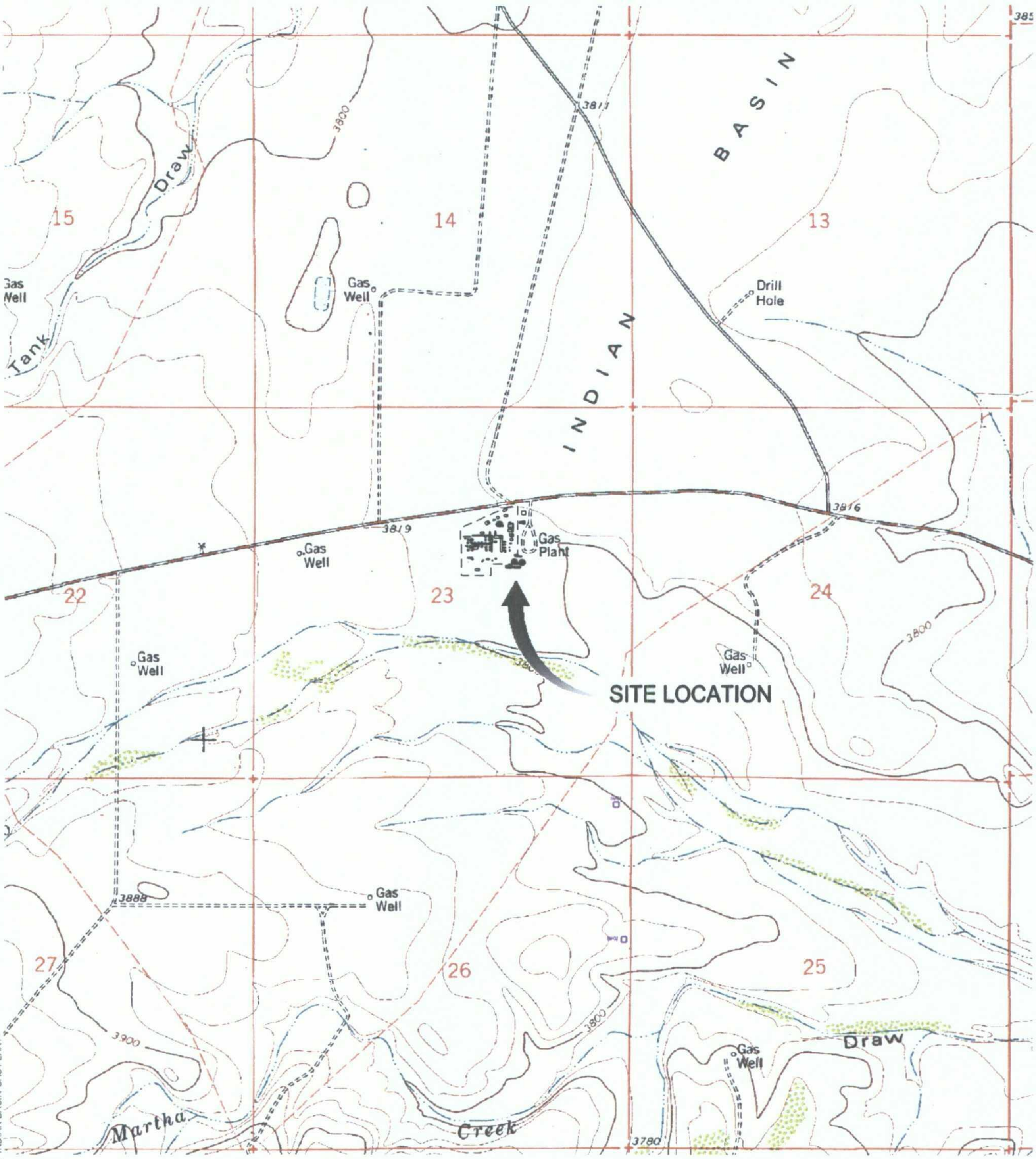
Well ID	Sample Date	Analytical Parameters						
		Benzene (ug/L)	Toluene (ug/L)	Ethylbenzene (ug/L)	Xylenes (ug/L)	Total BTEX (ug/L)	TDS (mg/L)	Chloride (mg/L)
Shallow Zone Wells								
MW-14	6/23/2010	1.1	<1	2.9	19.4	23.4	Not Sampled - not enough water to collect sample	
MW-45	6/23/2010	<1	<1	<1	<1	<1	4190	473
MW-46	6/23/2010	<1	<1	<1	<1	<1	Not Sampled - not enough water to collect sample	
MW-49	6/23/2010	24	<1	<1	<1	24	2650	408
MW-77	6/23/2010	<1	<1	<1	<1	<1	545	48
MW-106	6/23/2010	<1	<1	<1	<1	<1	349	3.12
MW-126	---	Not Sampled - well contained condensate						
Lower Queen Wells								
MW-58	---	Not Sampled - well contained condensate						
MW-66	6/22/2010	<1	<1	<1	<1	<1	768	9.09
MW-70	6/23/2010	<1	<1	<1	<1	<1	350	9.96
MW-81	---	Not Sampled - well contained condensate						
MW-88	6/22/2010	<1	<1	<1	<1	<1	919	35.2
MW-111	6/22/2010	<1	<1	<1	<1	<1	750	70.2
MW-113	---	Not Sampled - well contained condensate						
MW-127	6/23/2010	<1	<1	<1	2.2	2.2	746	44.4

Notes:

ug/L	Micrograms per liter
<5	Compound detected below the detection limit - limit indicated
---	Not Sampled
6	Indicates result above the detection limit and below the OCD standard
16	Indicates result at/above OCD standard

OCD Cleanup Goals/Regulatory Limits

Benzene	10 ug/L
Toluene	750 ug/L
Ethylbenzene	750 ug/L
Total Xylenes	620 ug/L
Total Diss. Solids	1,000 mg/L
Chloride	250 mg/L



SOURCE: U.S. GEOLOGICAL SURVEY 7½ MINUTE TOPOGRAPHIC SERIES, MARTHA CREEK, NEW MEXICO QUADRANGLE, PUBLISHED 1978.

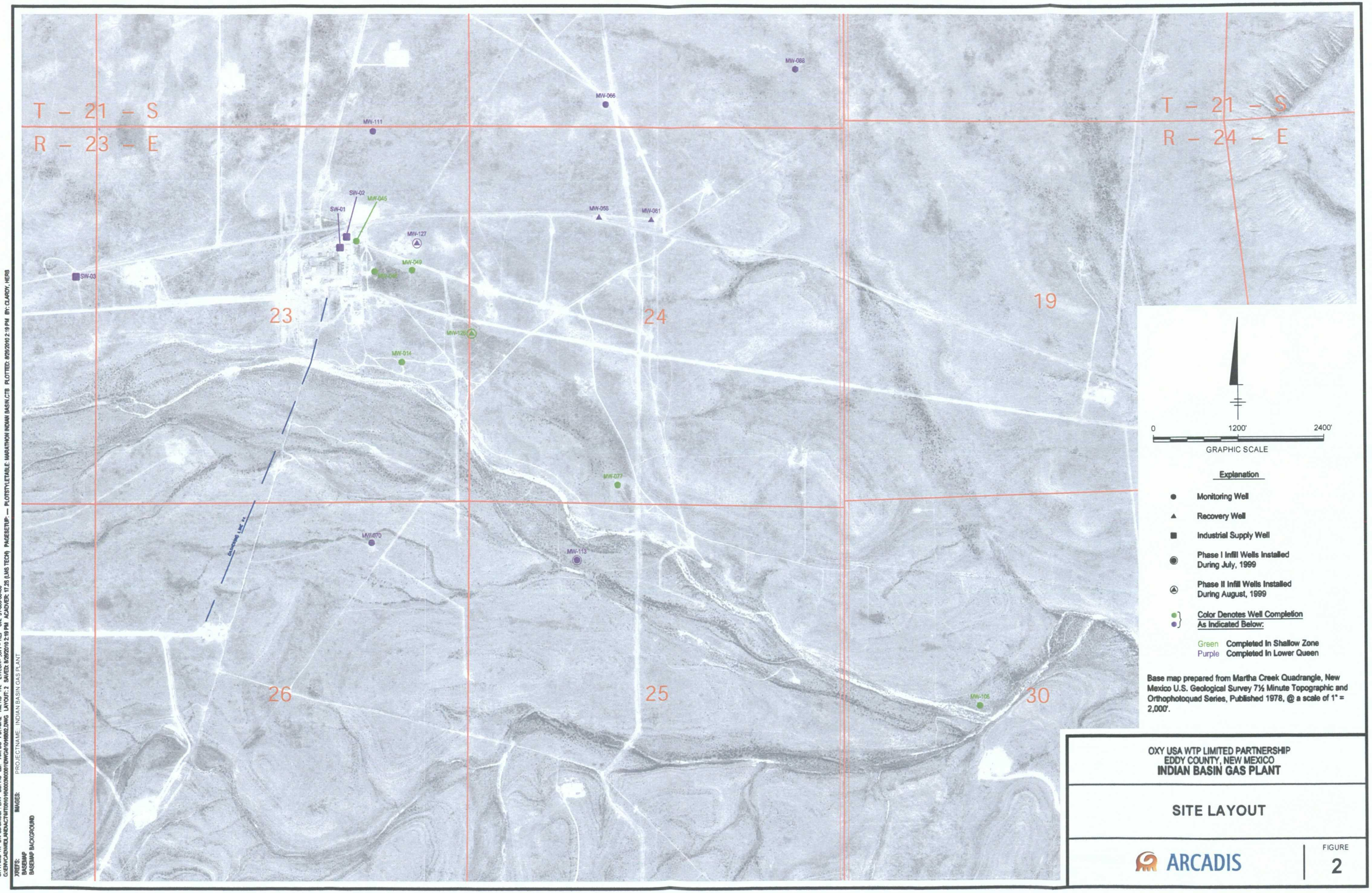
OXY USA WTP LIMITED PARTNERSHIP
EDDY COUNTY, NEW MEXICO
INDIAN BASIN GAS PLANT

SITE LOCATION MAP

ARCADIS

FIGURE
1

CITY: MID-TX DIV 85/GROUP: ENV DB: HC LD: AM: BG PD: AJR2 TM: AJR TR: LYR:ON=*;OFF=*REF* UN: 31-009-00479
G:\ENVCAD\MIDLAND\ACT\MT\0101\60003\00001\DWG\01016B01.DWG LAYOUT: 1 SAVED: 8/26/2010 2:13 PM ACADVER: 17.2S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: AGANDM.CTB PLOTTED: 8/26/2010 2:13 PM BY: CLARDY, HERB
XREFS: IMAGES: 32104d5.tif PROJECTNAME: INDIAN BASIN GAS PLANT



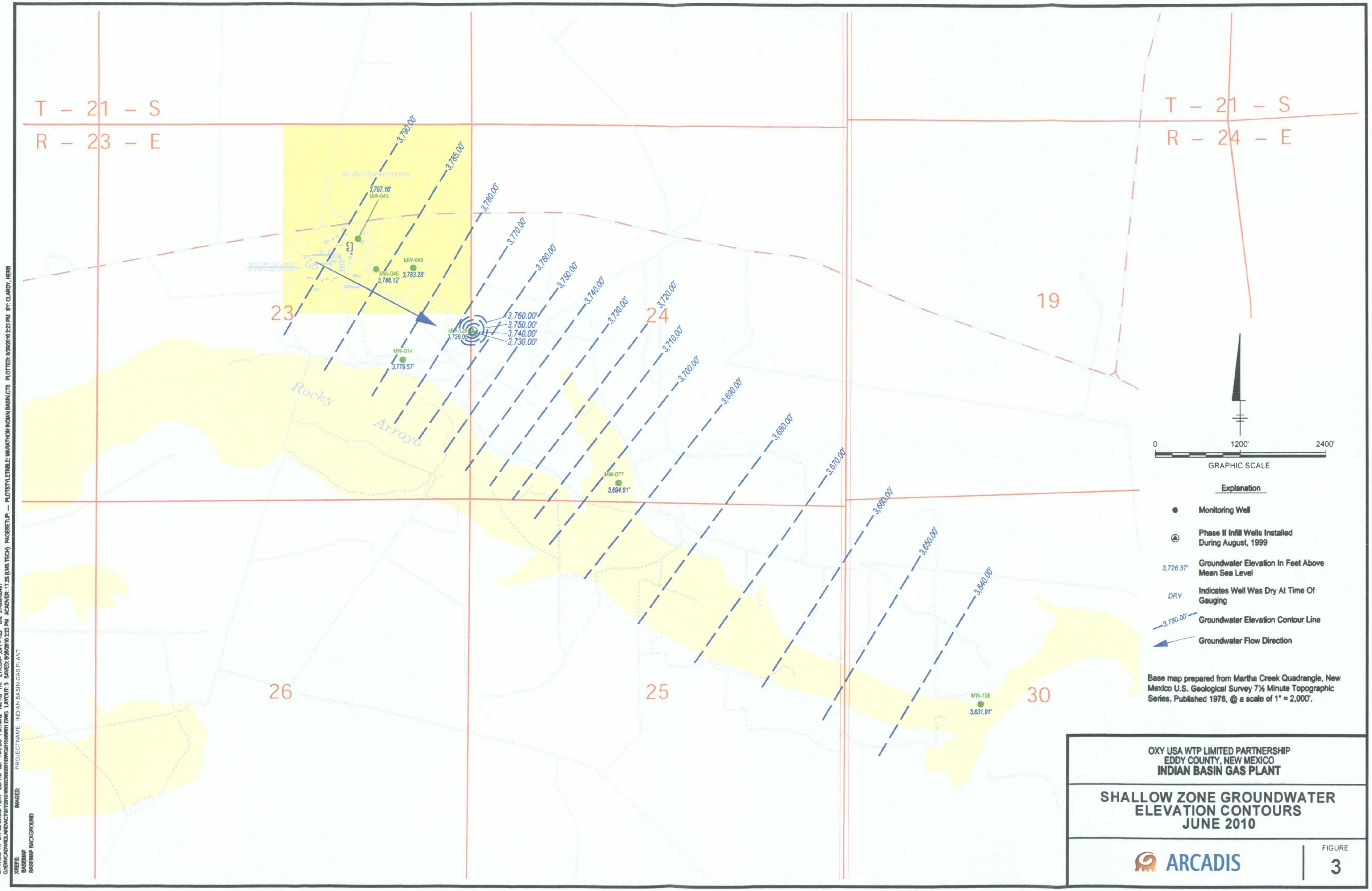
OXY USA WTP LIMITED PARTNERSHIP
EDDY COUNTY, NEW MEXICO
INDIAN BASIN GAS PLANT

SITE LAYOUT

ARCADIS

FIGURE 2

XREFS: BASEMAP BASEMAP BACKGROUND IMAGES: PROJECTNAME: INDIAN BASIN GAS PLANT


T - 21 - S
R - 23 - E
T - 21 - S
R - 24 - E
23
24
19
26
25
30
Marathon-Owned Property
3,787.16'
MW-045
MW-049
MW-046
3,783.28'
3,786.12'
MW-014
3,779.57'
3,726.05'
3,760.00'
3,750.00'
3,740.00'
3,730.00'
MW-077
3,694.91'
MW-106
3,631.91'
3,790.00'
3,785.00'
3,780.00'
3,770.00'
3,760.00'
3,750.00'
3,740.00'
3,730.00'
3,720.00'
3,710.00'
3,700.00'
3,690.00'
3,680.00'
3,670.00'
3,660.00'
3,650.00'
3,640.00'
Rocky
Arroyo
0
1200'
2400'
GRAPHIC SCALE
Explanation
Monitoring Well
Phase II Infill Wells Installed During August, 1999
3,726.37' Groundwater Elevation In Feet Above Mean Sea Level
DRY Indicates Well Was Dry At Time Of Gauging
3,780.00' Groundwater Elevation Contour Line
Groundwater Flow Direction
Base map prepared from Martha Creek Quadrangle, New Mexico U.S. Geological Survey 7½ Minute Topographic Series, Published 1978, @ a scale of 1" = 2,000'.
OXY USA WTP LIMITED PARTNERSHIP
EDDY COUNTY, NEW MEXICO
INDIAN BASIN GAS PLANT
SHALLOW ZONE GROUNDWATER
ELEVATION CONTOURS
JUNE 2010
ARCADIS
FIGURE
3

CITY: MID-TX DIV/GROUP: ENV DB: HC LD: AM BG PD: AJR2 TM: RB TR: LYR:ON=*;OFF=*REF* UR: 31-069-00481
XREFS: BASEMAP BASEMAP BACKGROUND IMAGES: PROJECTNAME: INDIAN BASIN GAS PLANT
LAYOUT: 3 SAVED: 8/26/2010 2:23 PM ACADVER: 17.2S (LMS TECH) PAGESETUP: — PLOTSTYLETABLE: MARATHON INDIAN BASIN.CTB PLOTTED: 8/26/2010 2:23 PM BY: CLARDY, HERB

T – 21 – S
R – 23 – E

T – 21 – S
R – 24 – E

MW-045	
Benzene	<1 µg/L
Toluene	<1 µg/L
Ethylbenzene	<1 µg/L
Xylenes	<1 µg/L
Total BTEX	<1 µg/L
TDS	4,190 mg/L
Chloride	473 mg/L

MW-049	
Benzene	24 µg/L
Toluene	<1 µg/L
Ethylbenzene	<1 µg/L
Xylenes	<1 µg/L
Total BTEX	24 µg/L
TDS	2,650 mg/L
Chloride	408 mg/L

MW-046	
Benzene	<1 µg/L
Toluene	<1 µg/L
Ethylbenzene	<1 µg/L
Xylenes	<1 µg/L
Total BTEX	<1 µg/L
TDS	NS - Not Enough Water
Chloride	NS - Not Enough Water

MW-126
NS - Well Contained Condensate

MW-014	
Benzene	1.1 µg/L
Toluene	<1 µg/L
Ethylbenzene	2.9 µg/L
Xylenes	19.4 µg/L
Total BTEX	23.4 µg/L
TDS	NS - Not Enough Water
Chloride	NS - Not Enough Water

MW-077	
Benzene	<1 µg/L
Toluene	<1 µg/L
Ethylbenzene	<1 µg/L
Xylenes	<1 µg/L
Total BTEX	<1 µg/L
TDS	545 mg/L
Chloride	48 mg/L

MW-106	
Benzene	<1 µg/L
Toluene	<1 µg/L
Ethylbenzene	<1 µg/L
Xylenes	<1 µg/L
Total BTEX	<1 µg/L
TDS	349 mg/L
Chloride	3.12 mg/L

Marathon-Owned Property

MW-045
MW-049
MW-046
MW-126
MW-014
MW-077
MW-106

Rocky Arroyo

23
24
19
26
25
30

0 1200' 2400'
GRAPHIC SCALE

Explanation

- Monitoring Well
- Phase II Infill Wells Installed During August, 1999

MW-049	
Benzene	24
Toluene	<1
Ethylbenzene	<1
Xylenes	<1
Total BTEX	24
Total Dissolved Solids	2,650
Chloride	408

Well ID
Red Numbers Indicate Constituent Detected Above OCD Cleanup Goals Or Regulatory Limits.
Concentration (µg/L or mg/L)
Constituent

OCD Cleanup Goals/Regulatory Limits

Benzene	10 µg/L
Toluene	750 µg/L
Ethylbenzene	750 µg/L
Total Xylenes	620 µg/L
Total Dissolved Solids	1,000 mg/L
Chlorides	250 mg/L

Notes:

- OCD – New Mexico Energy, Minerals And Natural Resources Department, Oil Conservation Division
- mg/L – Milligrams Per Liter
- µg/L – Micrograms Per Liter
- NS – Not Sampled - Not Enough Water To Sample, Well Dry Or Contained Condensate

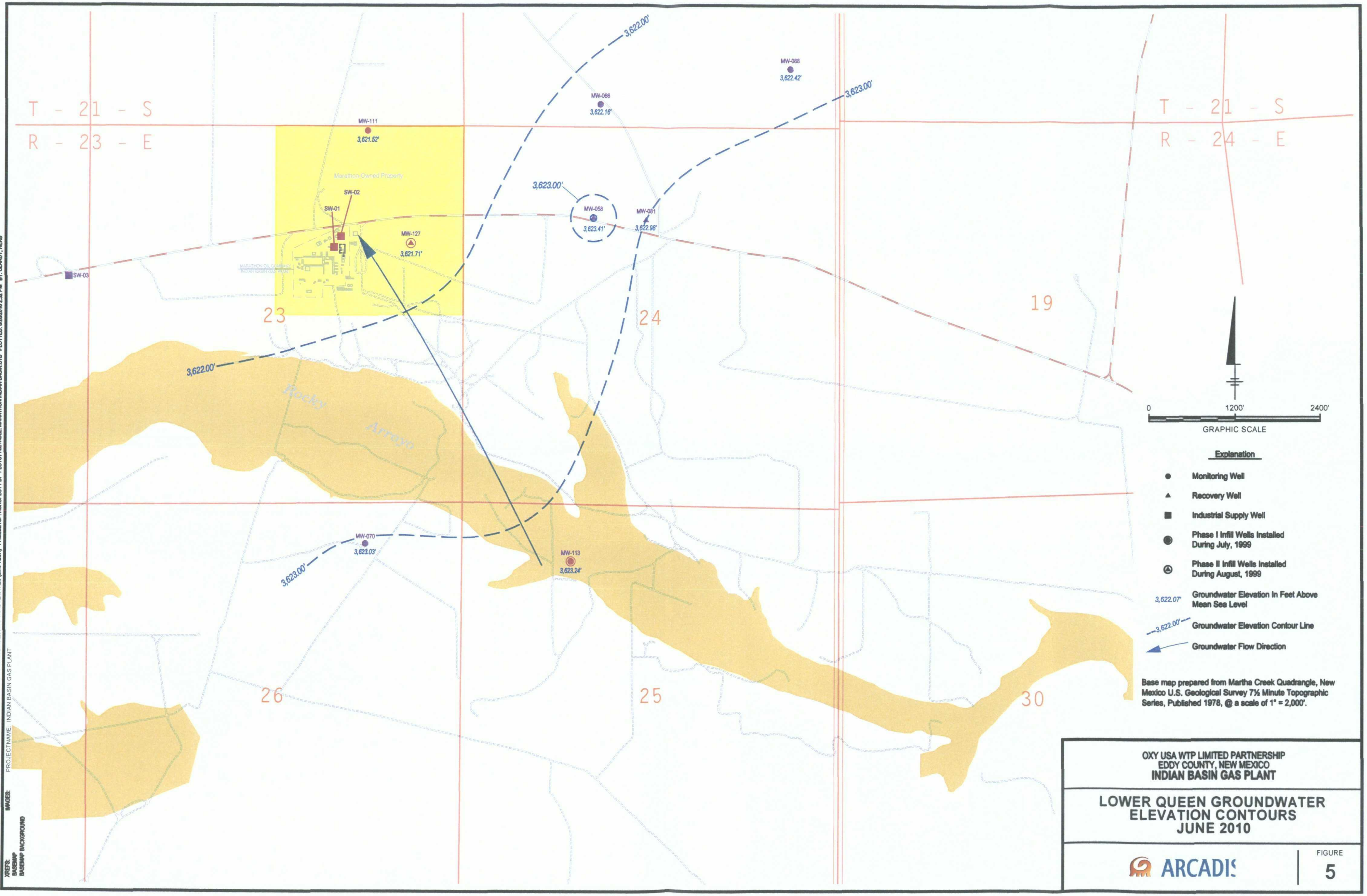
Base map prepared from Martha Creek Quadrangle, New Mexico U.S. Geological Survey 7½ Minute Topographic Series, Published 1978, @ a scale of 1" = 2,000'.

OXY USA WTP LIMITED PARTNERSHIP
EDDY COUNTY, NEW MEXICO
INDIAN BASIN GAS PLANT

SHALLOW ZONE BTEX, CHLORIDE AND TDS JUNE 2010

ARCADIS

FIGURE 4


T - 21 - S
R - 23 - E
T - 21 - S
R - 24 - E
MW-111
3,621.52'
Marathon Owned Property
SW-02
SW-01
SW-03
MW-127
3,621.71'
MW-066
3,622.16'
MW-068
3,622.42'
3,623.00'
MW-058
3,623.41'
MW-081
3,622.98'
3,622.00'
3,623.00'
3,622.00'
Rocky
Arroyo
MW-070
3,623.03'
3,623.00'
MW-113
3,623.24'
23
24
19
26
25
30
0
1200'
2400'
GRAPHIC SCALE
Explanation
Monitoring Well
Recovery Well
Industrial Supply Well
Phase I Infill Wells Installed During July, 1999
Phase II Infill Wells Installed During August, 1999
3,622.07' Groundwater Elevation In Feet Above Mean Sea Level
3,622.00' Groundwater Elevation Contour Line
Groundwater Flow Direction
Base map prepared from Martha Creek Quadrangle, New Mexico U.S. Geological Survey 7½ Minute Topographic Series, Published 1978, @ a scale of 1" = 2,000'.

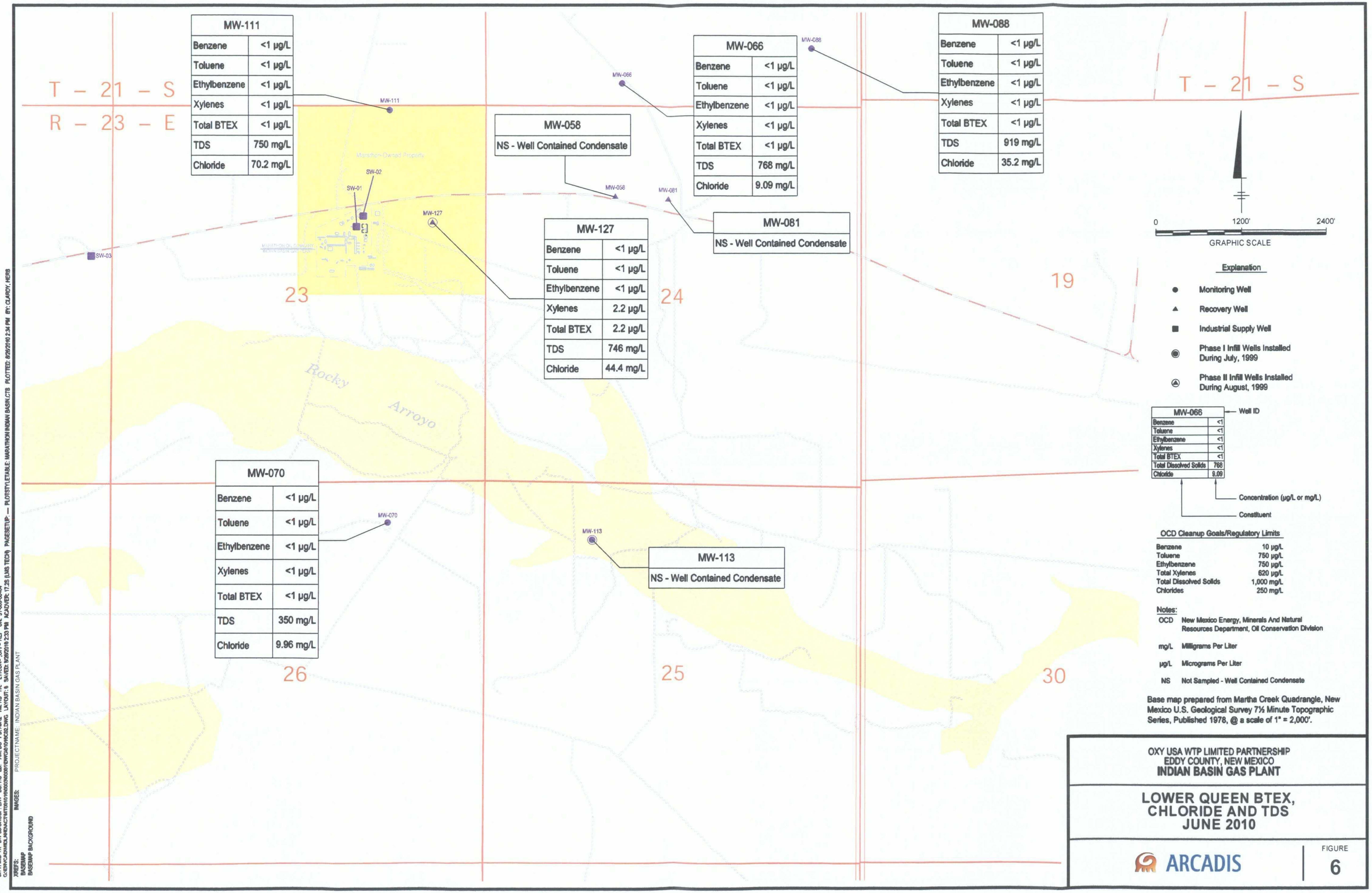
OXY USA WTP LIMITED PARTNERSHIP
EDDY COUNTY, NEW MEXICO
INDIAN BASIN GAS PLANT

LOWER QUEEN GROUNDWATER ELEVATION CONTOURS JUNE 2010

ARCADIS

FIGURE 5

CITY: MID-TX DIV 85/GROUP: ENV DB: NC LD: AM BG PD: AJR2 TM: RB TR: LYR:ON=*;OFF=*REF* UR: 31-009-00463
XREFS: BASEMAP BASEMAP BACKGROUND IMAGES: PROJECTNAME: INDIAN BASIN GAS PLANT



T - 21 - S
R - 23 - E
T - 21 - S
MW-111
Benzene <1 µg/L
Toluene <1 µg/L
Ethylbenzene <1 µg/L
Xylenes <1 µg/L
Total BTEX <1 µg/L
TDS 750 mg/L
Chloride 70.2 mg/L
MW-058
NS - Well Contained Condensate
MW-066
Benzene <1 µg/L
Toluene <1 µg/L
Ethylbenzene <1 µg/L
Xylenes <1 µg/L
Total BTEX <1 µg/L
TDS 768 mg/L
Chloride 9.09 mg/L
MW-088
Benzene <1 µg/L
Toluene <1 µg/L
Ethylbenzene <1 µg/L
Xylenes <1 µg/L
Total BTEX <1 µg/L
TDS 919 mg/L
Chloride 35.2 mg/L
MW-127
Benzene <1 µg/L
Toluene <1 µg/L
Ethylbenzene <1 µg/L
Xylenes 2.2 µg/L
Total BTEX 2.2 µg/L
TDS 746 mg/L
Chloride 44.4 mg/L
MW-081
NS - Well Contained Condensate
MW-070
Benzene <1 µg/L
Toluene <1 µg/L
Ethylbenzene <1 µg/L
Xylenes <1 µg/L
Total BTEX <1 µg/L
TDS 350 mg/L
Chloride 9.96 mg/L
MW-113
NS - Well Contained Condensate
MW-111
MW-066
MW-088
MW-058
MW-081
MW-127
MW-070
MW-113
SW-01
SW-02
SW-03
23
24
19
26
25
30
Rocky Arroyo
0 1200' 2400'
GRAPHIC SCALE
Explanation
Monitoring Well
Recovery Well
Industrial Supply Well
Phase I Infill Wells Installed During July, 1999
Phase II Infill Wells Installed During August, 1999
MW-066
Benzene <1
Toluene <1
Ethylbenzene <1
Xylenes <1
Total BTEX <1
Total Dissolved Solids 768
Chloride 9.09
Well ID
Concentration (µg/L or mg/L)
Constituent
OCD Cleanup Goals/Regulatory Limits
Benzene 10 µg/L
Toluene 750 µg/L
Ethylbenzene 750 µg/L
Total Xylenes 620 µg/L
Total Dissolved Solids 1,000 mg/L
Chlorides 250 mg/L
Notes:
OCD New Mexico Energy, Minerals And Natural Resources Department, Oil Conservation Division
mg/L Milligrams Per Liter
µg/L Micrograms Per Liter
NS Not Sampled - Well Contained Condensate
Base map prepared from Martha Creek Quadrangle, New Mexico U.S. Geological Survey 7½ Minute Topographic Series, Published 1978, @ a scale of 1" = 2,000'.
OXY USA WTP LIMITED PARTNERSHIP
EDDY COUNTY, NEW MEXICO
INDIAN BASIN GAS PLANT
LOWER QUEEN BTEX, CHLORIDE AND TDS
JUNE 2010
ARCADIS
FIGURE
6

ARCADIS

Appendix A

Historical Fluid Level Data

Appendix A
Historic Fluid Level Data, May 1991 - June 2010
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
Shallow Zone Wells					
MW-14	12/01/91	3803.61	9.68	0	3793.93
MW-14	10/01/93	3803.61	22.55	0	3781.06
MW-14	01/01/94	3803.61	22.78	0	3780.83
MW-14	01/27/98	3803.61	22.36	0	3781.25
MW-14	06/16/98	3803.61	22.88	0	3780.73
MW-14	04/19/99	3803.61	23.74	0.24	3780.05
MW-14	01/05/00	3803.61	22.22	0	3781.39
MW-14	04/26/00	3803.61	22.74	0.03	3780.89
MW-14	09/27/00	3803.61	23.40	0.09	3780.28
MW-14	04/16/01	3803.61	22.15	0.01	3781.47
MW-14	10/29/01	3803.61	21.98	0.08	3781.69
MW-14	04/15/02	3803.61	22.81	0	3780.80
MW-14	10/14/02	3803.61	18.17	0	3785.44
MW-14	04/15/03	3803.61	21.87	0	3781.74
MW-14	10/14/03	3803.61	22.19	0	3781.42
MW-14	04/05/04	3803.61	23.45	0.01	3780.17
MW-14	10/05/04	3803.61	18.36	0	3785.25
MW-14	04/19/05	3803.61	21.55	0	3782.06
MW-14	10/24/05	3803.61	20.69	0	3782.92
MW-14	04/18/06	3803.61	22.69	0	3780.92
MW-14	10/11/06	3803.61	19.20	0	3784.41
MW-14	04/16/07	3803.61	22.1	0	3781.51
MW-14	10/22/07	3803.61	21.15	0	3782.46
MW-14	05/27/09	3803.61	23.75	0	3779.86
MW-14	06/21/10	3803.61	24.04	0	3779.57
MW-45	12/01/91	3808.68	13.91	0	3794.77
MW-45	07/01/93	3808.68	21.49	0	3787.19
MW-45	10/01/93	3808.68	21.47	0	3787.21
MW-45	01/01/94	3808.68	21.54	0	3787.14
MW-45	04/01/94	3808.68	22.64	0	3786.04
MW-45	07/01/94	3808.68	21.85	0	3786.83
MW-45	10/01/94	3808.68	21.52	0	3787.16
MW-45	01/01/95	3808.68	21.78	0	3786.90
MW-45	04/01/95	3808.68	22.13	0	3786.55
MW-45	07/01/95	3808.68	22.13	0	3786.55
MW-45	01/05/00	3808.68	18.88	0	3789.80
MW-45	04/26/00	3808.68	19.19	0	3789.49
MW-45	09/27/00	3808.68	19.19	0	3789.49
MW-45	04/16/01	3808.68	18.39	0	3790.29
MW-45	10/29/01	3808.68	18.53	0	3790.15
MW-45	04/15/02	3808.68	18.75	0	3789.93
MW-45	10/14/02	3808.68	18.39	0	3790.29
MW-45	04/15/2003	3808.68	21.36	0	3787.32
MW-45	10/14/2003	3808.68	21.35	0	3787.33
MW-45	04/05/04	3808.68	21.69	0	3786.99
MW-45	10/05/04	3808.68	14.09	0	3794.59
MW-45	04/19/05	3808.68	16.94	0	3791.74
MW-45	10/24/05	3808.68	20.09	0	3788.59
MW-45	04/18/06	3808.68	20.72	0	3787.96
MW-45	10/11/06	3808.68	16.40	0	3792.28
MW-45	04/16/07	3808.68	19.98	0	3788.70
MW-45	10/22/07	3808.68	15.95	0	3792.73
MW-45	05/27/09	3808.68	21.56	0	3787.12
MW-45	06/21/10	3808.68	21.52	0	3787.16
MW-46	10/01/93	3805.54	19.87	0	3785.67
MW-46	01/01/94	3805.54	19.42	0	3786.12
MW-46	04/01/94	3805.54	19.59	0	3785.95
MW-46	10/01/94	3805.54	19.20	0	3786.34
MW-46	04/01/95	3805.54	19.55	0	3785.99
MW-46	07/01/95	3805.54	19.55	0	3785.99
MW-46	01/16/96	3805.54	19.48	0	3786.06
MW-46	04/19/96	3805.54	19.52	0	3786.02
MW-46	07/15/96	3805.54	19.41	0	3786.13
MW-46	10/13/96	3805.54	15.73	0	3789.81
MW-46	02/04/97	3805.54	18.22	0	3787.32
MW-46	04/28/97	3805.54	16.93	0	3788.61
MW-46	07/14/97	3805.54	17.15	0	3788.39
MW-46	10/13/97	3805.54	18.01	0	3787.53
MW-46	01/27/98	3805.54	17.54	0	3788.00
MW-46	04/27/98	3805.54	18.34	0	3787.20
MW-46	06/16/98	3805.54	18.69	0	3786.85
MW-46	10/10/98	3805.54	17.82	0	3787.72
MW-46	01/27/99	3805.54	16.91	0	3788.63
MW-46	04/19/99	3805.54	17.44	0	3788.10
MW-46	01/05/00	3805.54	16.76	0	3788.78
MW-46	04/26/00	3805.54	17.17	0	3788.37
MW-46	09/27/00	3805.54	17.42	0	3788.12
MW-46	04/16/01	3805.54	16.68	0	3788.86
MW-46	10/29/01	3805.54	16.79	0	3788.75
MW-46	04/15/02	3805.54	17.49	0	3788.05
MW-46	10/14/02	3805.54	17.83	0	3787.71

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
MW-46	04/15/03	3805.54	19.38	0	3786.16
MW-46	10/14/03	3805.54	19.62	0	3785.92
MW-46	04/05/04	3805.54	19.63	0	3785.91
MW-46	10/05/04	3805.54	13.05	0	3792.49
MW-46	04/19/05	3805.54	16.27	0	3789.27
MW-46	10/24/05	3805.54	19.38	0	3786.16
MW-46	04/18/06	3805.54	19.35	0	3786.19
MW-46	10/11/06	3805.54	15.74	0	3789.80
MW-46	04/16/07	3805.54	19.34	0	3786.20
MW-46	10/22/07	3805.54	15.67	0	3789.87
MW-46	05/27/09	3805.54	19.38	0	3786.16
MW-46	06/21/10	3805.54	19.42	0	3786.12
MW-49	12/01/91	3805.61	16.60	0	3789.01
MW-49	07/01/93	3805.61	21.98	0	3783.63
MW-49	10/01/93	3805.61	21.93	0	3783.68
MW-49	01/01/94	3805.61	22.27	0	3783.34
MW-49	04/01/94	3805.61	22.64	0	3782.97
MW-49	07/01/94	3805.61	22.73	0	3782.88
MW-49	10/01/94	3805.61	22.30	0	3783.31
MW-49	01/01/95	3805.61	22.56	0	3783.05
MW-49	04/01/95	3805.61	22.94	0	3782.67
MW-49	07/01/95	3805.61	22.94	0	3782.67
MW-49	10/01/95	3805.61	22.68	0	3782.93
MW-49	01/16/96	3805.61	22.55	0	3783.06
MW-49	04/19/96	3805.61	22.59	0	3783.02
MW-49	07/15/96	3805.61	22.76	0	3782.85
MW-49	10/13/96	3805.61	19.54	0	3786.07
MW-49	02/03/97	3805.61	20.66	0	3784.95
MW-49	03/18/97	3805.61	20.99	0	3784.62
MW-49	04/28/97	3805.61	20.70	0	3784.91
MW-49	07/14/97	3805.61	20.31	0	3785.30
MW-49	10/13/97	3805.61	21.01	0	3784.60
MW-49	01/27/98	3805.61	21.08	0	3784.53
MW-49	04/27/98	3805.61	21.34	0	3784.27
MW-49	06/16/98	3805.61	21.35	0	3784.26
MW-49	10/09/98	3805.61	22.52	0	3783.09
MW-49	01/27/99	3805.61	20.50	0	3785.11
MW-49	04/19/99	3805.61	20.81	0	3784.80
MW-49	01/05/00	3805.61	20.07	0	3785.54
MW-49	04/26/00	3805.61	20.30	0	3785.31
MW-49	09/27/00	3805.61	20.52	0	3785.09
MW-49	04/16/01	3805.61	20.03	0	3785.58
MW-49	10/29/01	3805.61	19.96	0	3785.65
MW-49	04/15/02	3805.61	19.76	0	3785.85
MW-49	10/14/02	3805.61	20.56	0	3785.05
MW-49	04/15/03	3805.61	22.08	0	3783.53
MW-49	10/14/03	3805.61	22.52	0	3783.09
MW-49	04/05/04	3805.61	22.79	0	3782.82
MW-49	10/05/04	3805.61	18.33	0	3787.28
MW-49	04/19/05	3805.61	18.23	0	3787.38
MW-49	10/24/05	3805.61	21.01	0	3784.60
MW-49	04/18/06	3805.61	22.29	0	3783.32
MW-49	10/11/06	3805.61	20.49	0	3785.12
MW-49	04/16/07	3805.61	21.43	0	3784.18
MW-49	10/22/07	3805.61	18.81	0	3786.80
MW-49	05/27/09	3805.61	22.35	0	3783.26
MW-49	06/21/10	3805.61	22.33	0	3783.28
MW-77	01/01/95	3775.48	80.03	0	3695.45
MW-77	04/01/95	3775.48	80.04	0	3695.44
MW-77	07/01/95	3775.48	80.04	0	3695.44
MW-77	10/01/95	3775.48	79.70	0	3695.78
MW-77	01/16/96	3775.48	79.84	0	3695.64
MW-77	04/17/96	3775.48	78.95	0	3696.53
MW-77	07/16/96	3775.48	79.42	0	3696.06
MW-77	10/14/96	3775.48	80.02	0	3695.46
MW-77	02/04/97	3775.48	D	0	--
MW-77	04/29/97	3775.48	80.35	0	3695.13
MW-77	07/15/97	3775.48	80.31	0	3695.17
MW-77	10/14/97	3775.48	78.92	0	3696.56
MW-77	01/28/98	3775.48	77.00	0	3698.48
MW-77	04/27/98	3775.48	78.48	0	3697.00
MW-77	06/16/98	3775.48	75.30	0	3700.18
MW-77	10/10/98	3775.48	79.84	0	3695.64
MW-77	01/27/99	3775.48	76.41	0	3699.07
MW-77	04/19/99	3775.48	77.50	0	3697.98
MW-77	01/05/00	3775.48	79.36	0	3696.12
MW-77	04/26/00	3775.48	78.57	0	3696.91
MW-77	09/27/00	3775.48	78.86	0	3696.62
MW-77	04/16/01	3775.48	79.91	0	3695.57
MW-77	10/29/01	3775.48	79.72	0	3695.76
MW-77	04/15/02	3775.48	80.42	0	3695.06
MW-77*	10/14/02	3775.48	57.95	0	3717.53

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
MW-77	04/15/03	3775.48	69.95	0	3705.53
MW-77	10/14/03	3775.48	73.98	0	3701.50
MW-77	04/05/04	3775.48	79.88	0	3695.60
MW-77	10/05/04	3775.48	63.37	0	3712.11
MW-77	04/19/05	3775.48	67.06	0	3708.42
MW-77	10/24/05	3775.48	63.89	0	3711.59
MW-77	04/18/06	3775.48	80.43	0	3695.05
MW-77	10/11/06	3775.48	78.89	0	3696.59
MW-77	04/17/07	3775.48	76.32	0	3699.16
MW-77	10/22/07	3775.48	73.36	0	3702.12
MW-77	05/27/09	3775.48	D	0	--
MW-77	06/21/10	3775.48	80.57	0	3694.91
MW-106	02/04/97	3721.97	87.97	0	3634.00
MW-106	04/28/97	3721.97	87.59	0	3634.38
MW-106	07/15/97	3721.97	87.63	0	3634.34
MW-106	10/13/97	3721.97	88.75	0	3633.22
MW-106	01/28/98	3721.97	88.97	0	3633.00
MW-106	04/27/98	3721.97	89.36	0	3632.61
MW-106	06/15/98	3721.97	89.63	0	3632.34
MW-106	10/10/98	3721.97	89.61	0	3632.36
MW-106	01/27/99	3721.97	86.55	0	3635.42
MW-106	04/19/99	3721.97	89.58	0	3632.39
MW-106	01/05/00	3721.97	89.05	0	3632.92
MW-106	04/26/00	3721.97	89.31	0	3632.66
MW-106	09/27/00	3721.97	87.98	0	3633.99
MW-106	04/16/01	3721.97	88.81	0	3633.16
MW-106	10/29/01	3721.97	89.05	0	3632.92
MW-106	04/15/02	3721.97	89.05	0	3632.92
MW-106	10/14/02	3721.97	87.40	0	3634.57
MW-106	04/15/03	3721.97	88.91	0	3633.06
MW-106	10/14/03	3721.97	89.94	0	3632.03
MW-106	04/05/04	3721.97	89.34	0	3632.63
MW-106	10/05/04	3721.97	75.78	0	3646.19
MW-106	04/19/05	3721.97	88.54	0	3633.43
MW-106	10/24/05	3721.97	88.47	0	3633.50
MW-106	04/18/06	3721.97	89.71	0	3632.26
MW-106	10/11/06	3721.97	87.09	0	3634.88
MW-106	04/17/07	3721.97	89.4	0	3632.57
MW-106	10/22/07	3721.97	88.64	0	3633.33
MW-106	05/27/09	3721.97	D	--	--
MW-106	06/21/10	3721.97	90.06	0	3631.91
MW-126	01/05/00	3795.58	53.08	0	3742.50
MW-126	04/26/00	3795.58	54.03	0	3741.55
MW-126	09/27/00	3795.58	60.29	0	3735.29
MW-126	04/16/01	3795.58	54.25	0.52	3741.71
MW-126	10/29/01	3795.58	57.82	2.1	3739.29
MW-126	04/15/02	3795.58	56.95	2.23	3740.26
MW-126	10/14/02	3795.58	54.03	2.57	3743.43
MW-126	04/15/03	3796.28	63.65	3.96	3735.52
MW-126	10/14/03	3796.28	68.01	0	3728.27
MW-126	04/05/04	3796.28	70.04	0	3726.24
MW-126	10/05/04	3796.28	48.01	0.01	3748.28
MW-126	04/19/05	3796.28	50.63	0.25	3745.83
MW-126	10/24/05	3796.28	51.78	0	3744.50
MW-126	04/18/06	3796.28	66.79	0	3729.49
MW-126	10/11/06	3796.28	51.76	0.08	3744.58
MW-126	04/17/07	3796.28	62.92	0.6	3732.92
MW-126	10/22/07	3796.28	56.30	0	3739.98
MW-126	05/27/09	3796.28	69.95	0.05	3726.37
MW-126	06/21/10	3796.28	70.40	0.23	3726.05

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

Appendix A
Historic Fluid Level Data, May 1991 - June 2010
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
Lower Queen Wells					
MW-58	07/16/91	3824.07	197.91	0	3626.16
MW-58	08/21/91	3824.07	193.76	0	3630.31
MW-58	09/18/91	3824.07	193.26	0	3630.81
MW-58	10/22/91	3824.07	194.45	0	3629.62
MW-58	11/15/91	3824.07	194.77	0	3629.30
MW-58	01/16/96	3824.07	D	--	--
MW-58	07/16/96	3824.07	D	--	--
MW-58	10/14/96	3824.07	196.01	0.01	3628.06
MW-58	02/04/97	3824.07	203.00	0	3621.07
MW-58	04/28/97	3824.07	204.14	0	3619.93
MW-58	07/15/97	3824.07	197.66	0	3626.41
MW-58	10/01/97	3824.07	199.20	0.3	3625.08
MW-58	10/09/97	3824.07	199.52	0.67	3625.03
MW-58	10/14/97	3824.07	196.10	0	3627.97
MW-58	01/28/98	3824.07	198.55	0	3625.52
MW-58	05/28/98	3824.07	205.14	0	3618.93
MW-58	10/11/98	3824.07	200.48	0	3623.59
MW-58	01/27/99	3824.07	D	--	--
MW-58	04/19/99	3824.07	217.17	0	3606.90
MW-58	01/05/00	3824.07	210.57	0	3613.50
MW-58	04/26/00	3824.07	223.51	0	3600.56
MW-58	09/27/00	3824.07	220.18	0	3603.89
MW-58	04/16/01	3824.07	114.83	0	3709.24
MW-58	10/29/01	3824.07	177.31	0	3644.41
MW-58	04/15/02	3824.07	201.92	0	3622.15
MW-58	10/14/02	3824.07	199.69	0	3624.38
MW-58	02/13/03	3824.07	201.08	0	3622.99
MW-58	03/10/03	3824.07	202.20	0	3621.87
MW-58	04/15/03	3824.07	201.17	0	3622.90
MW-58	05/15/03	3824.07	201.82	0	3622.25
MW-58	06/24/03	3824.07	201.71	0	3622.36
MW-58	07/15/03	3824.07	202.89	0	3621.18
MW-58	08/08/03	3824.07	201.98	0	3622.09
MW-58	09/12/05	3824.07	202.20	0	3621.87
MW-58	10/14/03	3824.07	202.19	0	3621.88
MW-58	11/07/03	3824.07	202.29	0	3621.78
MW-58	12/04/03	3824.07	202.26	0	3621.81
MW-58	01/08/04	3824.07	202.38	0.1	3621.76
MW-58	02/12/04	3824.07	202.47	0	3621.60
MW-58	03/25/04	3824.07	202.49	0	3621.58
MW-58	04/05/04	3824.07	202.32	0	3621.75
MW-58	05/27/04	3824.07	201.37	0.01	3622.71
MW-58	06/17/04	3824.07	202.00	0	3622.07
MW-58	07/15/04	3824.07	202.08	0	3621.99
MW-58	08/19/04	3824.07	202.98	0.06	3621.13
MW-58	09/09/04	3824.07	201.74	0	3622.33
MW-58	10/05/04	3824.07	198.82	0	3625.25
MW-58	11/19/04	3824.07	199.30	0.28	3624.97
MW-58	12/07/04	3824.07	202.14		3621.93
MW-58	01/11/05	3824.07	200.70	0.58	3623.79
MW-58	02/08/05	3824.07	200.56	0	3623.51
MW-58	03/08/05	3824.07	200.87	0	3623.20
MW-58	04/19/05	3824.07	207.19	0	3616.88
MW-58	05/09/05	3824.07	207.19	0	3616.88
MW-58	06/21/05	3824.07	200.04	0	3624.03
MW-58	07/19/05	3824.07	199.94	0	3624.13
MW-58	08/08/05	3824.07	200.03	0	3624.04
MW-58	09/20/05	3824.07	199.02	0	3625.05
MW-58	10/24/05	3824.07	199.84	0.46	3624.57
MW-58	04/18/06	3824.07	200.05	0	3624.02
MW-58	10/11/06	3824.07	199.04	0.2	3625.18
MW-58	04/16/07	3824.07	200.49	0.52	3623.20
MW-58	10/22/07	3824.07	199.65	0	3624.42
MW-58	05/27/09	3824.07	200.73	5.26	3627.18
MW-58	06/21/10	3824.07	200.74	0.11	3623.41
MW-66	08/21/91	3828.98	196.77	0	3632.21
MW-66	09/18/91	3828.98	198.73	0	3630.25
MW-66	10/22/91	3828.98	199.70	0	3629.28
MW-66	11/15/91	3828.98	199.88	0	3629.10
MW-66	03/01/92	3828.98	200.37	0	3628.61
MW-66	04/01/92	3828.98	200.25	0	3628.73
MW-66	05/01/92	3828.98	195.25	0	3633.73
MW-66	06/01/92	3828.98	196.08	0	3632.90
MW-66	07/01/92	3828.98	197.35	0	3631.63
MW-66	08/01/92	3828.98	197.77	0	3631.21
MW-66	09/01/92	3828.98	198.17	0	3630.81
MW-66	10/01/92	3828.98	198.40	0	3630.58
MW-66	11/01/92	3828.98	198.76	0	3630.22
MW-66	12/01/92	3828.98	198.98	0	3630.00
MW-66	01/01/93	3828.98	199.10	0	3629.88
MW-66	02/01/93	3828.98	199.23	0	3629.75

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

Appendix A
Historic Fluid Level Data, May 1991 - June 2010
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
MW-66	03/01/93	3828.98	199.49	0	3629.49
MW-66	04/01/93	3828.98	199.38	0	3629.60
MW-66	05/01/93	3828.98	199.63	0	3629.35
MW-66	06/01/93	3828.98	199.59	0	3629.39
MW-66	07/01/93	3828.98	199.82	0	3629.16
MW-66	08/01/93	3828.98	199.78	0	3629.20
MW-66	09/01/93	3828.98	200.01	0	3628.97
MW-66	10/01/93	3828.98	200.09	0	3628.89
MW-66	11/01/93	3828.98	200.35	0	3628.63
MW-66	12/01/93	3828.98	200.42	0	3628.56
MW-66	01/01/94	3828.98	200.33	0	3628.65
MW-66	02/01/94	3828.98	201.39	0	3627.59
MW-66	03/01/94	3828.98	201.44	0	3627.54
MW-66	04/01/94	3828.98	201.36	0	3627.62
MW-66	05/01/94	3828.98	201.26	0	3627.72
MW-66	07/01/94	3828.98	200.91	0	3628.07
MW-66	08/01/94	3828.98	199.86	0	3629.12
MW-66	09/01/94	3828.98	200.66	0	3628.32
MW-66	10/01/94	3828.98	200.83	0	3628.15
MW-66	12/01/94	3828.98	201.96	0	3627.02
MW-66	01/01/95	3828.98	201.04	0	3627.94
MW-66	04/01/95	3828.98	202.26	0	3626.72
MW-66	07/01/95	3828.98	201.59	0	3627.39
MW-66	10/01/95	3828.98	201.62	0	3627.36
MW-66	01/16/96	3828.98	200.89	0	3628.09
MW-66	04/17/96	3828.98	202.29	0	3626.69
MW-66	07/16/96	3828.98	202.45	0	3626.53
MW-66	10/13/96	3828.98	200.80	0	3628.18
MW-66	02/04/97	3828.98	202.60	0	3626.38
MW-66	04/28/97	3828.98	202.84	0	3626.14
MW-66	07/14/97	3828.98	202.72	0	3626.26
MW-66	09/30/97	3828.98	204.00	0	3624.98
MW-66	10/09/97	3828.98	204.20	0	3624.78
MW-66	10/13/97	3828.98	203.77	0	3625.21
MW-66	01/27/98	3828.98	203.79	0	3625.19
MW-66	04/27/98	3828.98	204.09	0	3624.89
MW-66	05/28/98	3828.98	204.18	0	3624.80
MW-66	06/15/98	3828.98	204.37	0	3624.61
MW-66	10/10/98	3828.98	204.86	0	3624.12
MW-66	01/27/99	3828.98	205.05	0	3623.93
MW-66	04/19/99	3828.98	205.10	0	3623.88
MW-66	01/05/99	3828.98	205.13	0	3623.85
MW-66	04/26/00	3828.98	205.41	0	3623.57
MW-66	09/27/00	3828.98	205.78	0	3623.20
MW-66	04/16/01	3828.98	205.59	0	3623.39
MW-66	10/29/01	3828.98	206.04	0	3622.94
MW-66	04/15/02	3828.98	205.98	0	3623.00
MW-66	10/14/02	3828.98	199.87	0	3629.11
MW-66	04/15/03	3828.98	205.39	0	3623.59
MW-66	10/14/03	3828.98	206.41	0	3622.57
MW-66	04/05/04	3828.98	206.65	0	3622.33
MW-66	10/05/04	3828.98	203.05	0	3625.93
MW-66	04/19/05	3828.98	205.48	0	3623.50
MW-66	10/24/05	3828.98	204.97	0	3624.01
MW-66	04/18/06	3828.98	205.44	0	3623.54
MW-66	10/11/06	3828.98	204.64	0	3624.34
MW-66	04/16/07	3828.98	205.51	0	3623.47
MW-66	10/22/07	3828.98	205.29	0	3623.69
MW-66	05/27/09	3828.98	206.47	0	3622.51
MW-66	06/21/10	3828.98	206.82	0	3622.16
MW-70	09/18/91	3822.57	191.59	0	3630.98
MW-70	10/22/91	3822.57	191.68	0	3630.89
MW-70	11/15/91	3822.57	192.20	0	3630.37
MW-70	03/01/92	3822.57	192.74	0	3629.83
MW-70	04/01/92	3822.57	192.62	0	3629.95
MW-70	05/01/92	3822.57	189.97	0	3632.60
MW-70	06/01/92	3822.57	188.42	0	3634.15
MW-70	07/01/92	3822.57	188.87	0	3633.70
MW-70	08/01/92	3822.57	189.54	0	3633.03
MW-70	09/01/92	3822.57	190.02	0	3632.55
MW-70	10/01/92	3822.57	190.48	0	3632.09
MW-70	11/01/92	3822.57	190.86	0	3631.71
MW-70	12/01/92	3822.57	191.17	0	3631.40
MW-70	01/01/93	3822.57	191.39	0	3631.18
MW-70	02/01/93	3822.57	191.54	0	3631.03
MW-70	03/01/93	3822.57	191.77	0	3630.80
MW-70	04/01/93	3822.57	191.80	0	3630.77
MW-70	05/01/93	3822.57	192.09	0	3630.48
MW-70	06/01/93	3822.57	192.18	0	3630.39
MW-70	07/01/93	3822.57	192.32	0	3630.25
MW-70	08/01/93	3822.57	192.30	0	3630.27
MW-70	09/01/93	3822.57	192.53	0	3630.04

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

Appendix A
Historic Fluid Level Data, May 1991 - June 2010
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
MW-70	10/01/93	3822.57	192.65	0	3629.92
MW-70	11/01/93	3822.57	192.91	0	3629.66
MW-70	12/01/93	3822.57	192.96	0	3629.61
MW-70	01/01/94	3822.57	192.99	0	3629.58
MW-70	02/01/94	3822.57	194.02	0	3628.55
MW-70	03/01/94	3822.57	194.00	0	3628.57
MW-70	04/01/94	3822.57	193.19	0	3629.38
MW-70	05/01/94	3822.57	193.86	0	3628.71
MW-70	07/01/94	3822.57	193.59	0	3628.98
MW-70	08/01/94	3822.57	193.09	0	3629.48
MW-70	09/01/94	3822.57	193.17	0	3629.40
MW-70	10/01/94	3822.57	193.38	0	3629.19
MW-70	12/01/94	3822.57	194.58	0	3627.99
MW-70	01/01/95	3822.57	192.83	0	3629.74
MW-70	04/01/95	3822.57	194.11	0	3628.46
MW-70	07/01/95	3822.57	194.19	0	3628.38
MW-70	10/01/95	3822.57	194.19	0	3628.38
MW-70	01/16/96	3822.57	194.68	0	3627.89
MW-70	04/17/96	3822.57	194.94	0	3627.63
MW-70	07/15/96	3822.57	194.70	0	3627.87
MW-70	10/13/96	3822.57	193.98	0	3628.59
MW-70	02/03/97	3822.57	194.47	0	3628.10
MW-70	04/28/97	3822.57	195.01	0	3627.56
MW-70	07/14/97	3822.57	195.44	0	3627.13
MW-70	10/01/97	3822.57	196.20	0	3626.37
MW-70	10/13/97	3822.57	196.05	0	3626.52
MW-70	10/29/97	3822.57	196.24	0.01	3626.33
MW-70	11/04/97	3822.57	196.35	0	3626.22
MW-70	11/12/97	3822.57	196.34	0	3626.23
MW-70	11/19/97	3822.57	196.36	0.01	3626.21
MW-70	11/24/97	3822.57	196.36	0	3626.21
MW-70	12/10/97	3822.57	196.47	0	3626.10
MW-70	01/27/98	3822.57	196.22	0	3626.35
MW-70	02/25/98	3822.57	196.45	0	3626.12
MW-70	04/27/98	3822.57	196.48	0	3626.09
MW-70	05/28/98	3822.57	196.91	0	3625.66
MW-70	06/15/98	3822.57	196.74	0	3625.83
MW-70	10/09/98	3822.57	197.27	0	3625.30
MW-70	01/27/99	3822.57	199.24	0	3623.33
MW-70	04/19/99	3822.57	197.40	0	3625.17
MW-70	01/05/00	3822.57	197.73	0	3624.84
MW-70	04/26/00	3822.57	197.71	0	3624.86
MW-70	09/27/00	3822.57	198.02	0	3624.55
MW-70	04/16/01	3822.57	198.34	0	3624.23
MW-70	10/29/01	3822.57	198.30	0	3624.27
MW-70	04/15/02	3822.57	198.85	0	3623.72
MW-70	10/14/02	3822.57	196.95	0	3625.62
MW-70	04/15/03	3822.57	198.12	0	3624.45
MW-70	10/14/03	3822.57	199.14	0	3623.43
MW-70	04/05/04	3822.57	199.41	0	3623.16
MW-70	10/05/04	3822.57	197.30	0	3625.27
MW-70	04/19/05	3822.57	197.70	0	3624.87
MW-70	10/24/05	3822.57	197.24	0	3625.33
MW-70	04/18/06	3822.57	198.46	0	3624.11
MW-70	10/11/06	3822.57	196.99	0	3625.58
MW-70	04/17/07	3822.57	198.51	0	3624.06
MW-70	10/22/07	3822.57	198.03	0	3624.54
MW-70	05/27/09	3822.57	199.45	0	3623.12
MW-70	06/21/10	3822.57	199.54	0	3623.03
MW-81	10/01/95	3817.03	195.77	2.74	3623.26
MW-81	01/16/96	3817.03	199.04	4.29	3621.12
MW-81	04/17/96	3817.03	204.35	9.95	3619.94
MW-81	07/16/96	3817.03	204.26	9.37	3619.61
MW-81	10/13/96	3817.03	202.11	8.49	3621.11
MW-81	02/04/97	3817.03	197.25	2.11	3621.32
MW-81	04/28/97	3817.03	204.40	9.15	3619.30
MW-81	07/14/97	3817.03	196.19	1.45	3621.89
MW-81	10/09/97	3817.03	200.02	0.02	3617.02
MW-81	10/14/97	3817.03	200.96	0.06	3616.11
MW-81	10/29/97	3817.03	202.44	1.44	3615.64
MW-81	11/04/97	3817.03	200.92	0	3616.11
MW-81	11/12/97	3817.03	200.95	0.25	3616.26
MW-81	11/19/97	3817.03	200.94	0.01	3616.09
MW-81	11/24/97	3817.03	200.81	0	3616.22
MW-81	12/10/97	3817.03	200.85	0	3616.18
MW-81	01/06/98	3817.03	199.35	0	3617.68
MW-81	01/15/98	3817.03	199.30	0	3617.73
MW-81	01/20/98	3817.03	200.89	0.79	3616.71
MW-81	01/27/98	3817.03	200.14	0.89	3617.53
MW-81	02/03/98	3817.03	200.88	0.58	3616.57
MW-81	02/10/98	3817.03	206.74	1.64	3611.48
MW-81	02/17/98	3817.03	218.70	12.08	3607.14

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

Appendix A
Historic Fluid Level Data, May 1991 - June 2010
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
MW-81	02/25/98	3817.03	217.41	11.41	3607.94
MW-81	04/27/98	3817.03	197.05	0	3619.98
MW-81	05/28/98	3817.03	192.28	0	3624.75
MW-81	06/15/98	3817.03	197.58	0	3619.45
MW-81	10/11/98	3817.03	193.23	0	3623.80
MW-81	01/27/99	3817.03	200.12	0	3616.91
MW-81	04/19/99	3817.03	200.84	0	3616.19
MW-81	01/05/00	3817.03	199.38	0	3617.65
MW-81	04/26/00	3817.03	201.35	0	3615.68
MW-81	09/27/00	3817.03	202.99	0	3614.04
MW-81	04/16/01	3817.03	201.94	0	3615.09
MW-81	10/29/01	3817.03	204.69	0	3609.04
MW-81	04/15/02	3817.03	193.94	0	3623.09
MW-81	10/14/02	3817.03	192.80	0	3624.23
MW-81	04/15/03	3817.03	193.41	0	3623.62
MW-81	10/14/03	3817.03	194.42	0	3622.61
MW-81	04/05/04	3817.03	194.58	0	3622.45
MW-81	10/05/04	3817.03	192.67	2.96	3626.52
MW-81	04/19/05	3817.03	193.75	0	3623.28
MW-81	10/24/05	3817.03	192.46	0	3624.57
MW-81	04/18/06	3817.03	192.78	0	3624.25
MW-81	10/11/06	3817.03	194.15	2.56	3624.75
MW-81	04/16/07	3817.03	198.12	6.32	3614.30
MW-81	10/22/07	3817.03	189.54	0	3627.49
MW-81	05/27/09	3817.03	193.97	0.10	3623.13
MW-81	06/21/10	3817.03	194.21	0.22	3622.98
MW-88	08/01/96	3789.70	163.59	0	3626.11
MW-88	10/13/96	3789.70	162.22	0	3627.48
MW-88	02/04/97	3789.70	163.38	0	3626.32
MW-88	04/28/97	3789.70	163.54	0	3626.16
MW-88	07/14/97	3789.70	163.84	0	3625.86
MW-88	10/01/97	3789.70	164.40	0	3625.30
MW-88	10/09/97	3789.70	164.38	0	3625.32
MW-88	10/13/97	3789.70	164.34	0	3625.36
MW-88	01/27/98	3789.70	164.41	0	3625.29
MW-88	04/27/98	3789.70	164.84	0	3624.86
MW-88	05/28/98	3789.70	164.00	0	3625.70
MW-88	06/15/98	3789.70	164.87	0	3624.83
MW-88	10/10/98	3789.70	165.38	0	3624.32
MW-88	01/27/99	3789.70	165.49	0	3624.21
MW-88	04/19/99	3789.70	165.54	0	3624.16
MW-88	01/05/00	3789.70	165.62	0	3624.08
MW-88	04/26/00	3789.70	165.87	0	3623.83
MW-88	09/27/00	3789.70	166.25	0	3623.45
MW-88	04/16/01	3789.70	166.21	0	3623.49
MW-88	10/29/01	3789.70	166.49	0	3623.21
MW-88	04/15/02	3789.70	166.53	0	3623.17
MW-88	10/14/02	3789.70	165.52	0	3624.18
MW-88	04/15/03	3789.70	165.98	0	3623.72
MW-88	10/14/03	3789.70	166.89	0	3622.81
MW-88	04/05/04	3789.70	167.15	0	3622.55
MW-88	10/05/04	3789.70	163.52	0	3626.18
MW-88	04/19/05	3789.70	166.38	0	3623.32
MW-88	10/24/05	3789.70	165.67	0	3624.03
MW-88	04/18/06	3789.70	166.15	0	3623.55
MW-88	10/11/06	3789.70	165.49	0	3624.21
MW-88	04/16/07	3789.7	166.11	0	3623.59
MW-88	10/22/07	3789.70	165.92	0	3623.78
MW-88	05/27/09	3789.70	166.91	0	3622.79
MW-88	06/21/10	3789.70	167.28	0	3622.42

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

Appendix A
Historic Fluid Level Data, May 1991 - June 2010
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Date	Measuring Point Elevation (feet amsl)	Depth to Water (feet bmp)	Condensate Thickness (feet)	Corrected Water-Level Elevation (feet amsl)
MW-111	06/19/98	3824.44	200.24	0	3624.20
MW-111	10/10/98	3824.44	200.89	0	3623.55
MW-111	01/27/99	3824.44	201.24	0	3623.20
MW-111	04/19/99	3824.44	201.26	0	3623.18
MW-111	01/05/00	3824.44	201.21	0	3623.23
MW-111	04/26/00	3824.44	201.48	0	3622.96
MW-111	09/27/00	3824.44	201.66	0	3622.78
MW-111	04/16/01	3824.44	201.74	0	3622.70
MW-111	10/29/01	3824.44	201.64	0	3622.80
MW-111	04/15/02	3824.44	201.83	0	3622.61
MW-111	10/14/02	3824.44	200.52	0	3623.92
MW-111	04/15/03	3824.44	201.21	0	3623.23
MW-111	10/14/03	3824.44	202.50	0	3621.94
MW-111	04/05/04	3824.44	202.54	0	3621.90
MW-111	10/05/04	3824.44	200.25	0	3624.19
MW-111	04/19/05	3824.44	201.09	0	3623.35
MW-111	10/24/05	3824.44	200.61	0	3623.83
MW-111	04/18/06	3824.44	201.17	0	3623.27
MW-111	10/11/06	3824.44	200.06	0	3624.38
MW-111	04/16/07	3824.44	201.28	0	3623.16
MW-111	10/22/07	3824.44	201.24	0	3623.20
MW-111	05/27/09	3824.44	202.50	0	3621.94
MW-111	06/21/10	3824.44	202.92	0	3621.52
MW-113	01/05/00	3772.67	147.43	0	3625.24
MW-113	04/26/00	3772.67	148.28	0.88	3625.03
MW-113	09/27/00	3772.67	147.72	0	3624.95
MW-113	04/16/01	3772.67	148.11	0.13	3624.65
MW-113	10/29/01	3772.67	148.95	0.2	3623.87
MW-113	04/15/02	3772.67	148.72	0.14	3624.05
MW-113	10/14/02	3772.67	147.33	0	3625.34
MW-113	04/15/03	3772.67	148.69	0.53	3624.37
MW-113	10/14/03	3772.67	149.24	0.21	3623.58
MW-113	04/05/04	3772.67	142.42	0.2	3630.40
MW-113	10/05/04	3772.67	144.58	0	3628.09
MW-113	04/19/05	3772.67	147.90	0	3624.77
MW-113	10/24/05	3772.67	147.51	0	3625.16
MW-113	04/18/06	3772.67	148.21	0	3624.46
MW-113	10/11/06	3772.67	147.29	0	3625.38
MW-113	04/17/07	3772.67	148.61	0.31	3623.83
MW-113	10/22/07	3772.67	NA	--	--
MW-113	05/27/09	3772.67	149.10	T	3623.57
MW-113	06/21/10	3772.67	149.47	0.05	3623.16
MW-127	01/05/00	3825.17	202.12	0	3623.05
MW-127	04/26/00	3825.17	202.34	0.46	3623.17
MW-127	09/27/00	3825.17	202.00	0	3623.17
MW-127	04/16/01	3825.17	202.70	0.07	3622.52
MW-127	10/29/01	3825.17	202.51	0.03	3622.68
MW-127	04/15/02	3825.17	202.74	0	3622.43
MW-127	10/14/02	3825.17	200.92	0	3624.25
MW-127	04/15/03	3825.17	202.50	0	3622.67
MW-127	10/14/03	3825.17	202.99	0	3622.18
MW-127	04/05/04	3825.17	203.15	0	3622.02
MW-127	10/05/04	3825.17	200.48	0	3624.69
MW-127	04/19/05	3825.17	201.81	0	3623.36
MW-127	10/24/05	3825.17	201.00	0	3624.17
MW-127	04/18/06	3825.17	201.80	0	3623.37
MW-127	10/11/06	3825.17	200.66	0	3624.51
MW-127	04/17/07	3825.17	202.3	0	3622.87
MW-127	10/22/07	3825.17	201.97	0	3623.20
MW-127	05/27/09	3825.17	203.10	0	3622.07
MW-127	06/21/10	3825.17	203.46	0	3621.71

Notes:
* MW-77 DTW does not agree with historical data.

D = Dry
NA = Not Available
NG = Not Gauged
NR = No Record

ARCADIS

Appendix B

Historical Analytical Data

Appendix B

Historical BTEX Analytical Data, May 1991 - June 2010
OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Sample Date	Analytical Results			
		Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-14	09/01/91	5100	--	--	--
MW-14	06/22/98	820	<10	840	<10
MW-14	04/18/02	116	9	<5	<5
MW-14	10/16/02	23	<5	5	<5
MW-14	04/09/03	<5	<5	<5	<5
MW-14	10/24/03	330	<5	<5	<5
MW-14	Not Sampled - Condensate Present				
MW-14	04/25/05	174	<5	<5	<15
MW-14	04/27/06	31.9	<2.74	<2.03	<5.81
MW-14	04/20/07	30	<5	<5	<15
MW-14	05/27/09	1.1	<1	1.1	17
MW-14	06/23/10	1.1	<1	2.9	19.4
MW-45	06/01/91	<1	--	--	--
MW-45	06/22/91	--	<1	<1	<1
MW-45	09/01/91	<1	--	--	--
MW-45	12/01/91	<1	<1	<1	<1
MW-45	07/15/93	<3	6	7	4
MW-45	10/14/93	<3	3	<3	3
MW-45	01/13/94	<0.5	<0.5	<0.5	<0.5
MW-45	04/06/94	<0.5	<0.5	<0.5	<0.5
MW-45	07/20/94	<0.5	<0.5	<0.5	<0.5
MW-45	05/29/09	<1	<1	<1	1.7
MW-45	06/23/10	<1	<1	<1	<1
MW-46	06/01/91	3200	--	--	--
MW-46	06/22/91	--	<50	900	<50
MW-46	07/01/91	300	--	--	--
MW-46	07/19/91	--	<50	250	--
MW-46	07/30/91	--	--	--	250
MW-46	09/01/91	140	--	--	--
MW-46	10/01/96	900	33	440	59
MW-46	02/11/97	3300	550	1000	1400
MW-46	05/29/97	5000	1200	230	<100
MW-46	07/18/97	6100	1900	270	130
MW-46	04/30/98	1600	41	140	290
MW-46	07/01/98	1700	<5	97	120
MW-46	04/20/99	210	<5	11	20
MW-46	12/08/99	50	43	34	129
MW-46	04/28/00	17	<1	<1	<1
MW-46	10/02/00	12	39	19	128
MW-46	04/19/01	<5	<5	<5	<10
MW-46	10/31/01	<100	<100	<100	<200
MW-46	04/17/02	<5	<5	<5	<5
MW-46	10/16/02	14	<5	<5	<5
MW-46	04/09/03	<5	<5	<5	<5
MW-46	Not Sampled - Dry				
MW-46	04/08/04	10	<5	<5	<5
MW-46	04/27/05	<5	<5	<5	<15
MW-46	Not Sampled - Dry				
MW-46	04/23/07	81.4	<5	<5	<15
MW-46	05/27/09	<1	<1	<1	1.1
MW-46	06/23/10	<1	<1	<1	<1

Notes:
Concentrations listed in micrograms per liter (ug/L)
<5 Constituent not detected above noted laboratory detection limit
-- Indicates parameter was not analyzed

Appendix B

Historical BTEX Analytical Data, May 1991 - June 2010

OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Sample Date	Analytical Results			
		Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-49	06/01/91	60	--	--	--
MW-49	06/22/91	--	<10	60	40
MW-49	09/01/91	35	--	--	--
MW-49	07/15/93	210	27	42	30
MW-49	10/14/93	68	26	.9	20
MW-49	01/13/94	13	<5	15	110
MW-49	04/06/94	82	<0.5	11	10
MW-49	07/20/94	150	<5	32	27
MW-49	10/05/94	78	49	40	300
MW-49	01/11/95	220	<5	46	97
MW-49	04/06/95	120	<0.5	24	26
MW-49	07/21/95	17	<0.5	3.5	3.4
MW-49	10/12/95	240	<50	59	130
MW-49	01/20/96	160	130	120	570
MW-49	04/19/96	87	23	18	32
MW-49	07/01/96	370	220	190	630
MW-49	10/01/96	95	16	36	12
MW-49	02/07/97	79	66	45	160
MW-49	07/18/97	130	<1	35	9.8
MW-49	04/30/98	130	39	41	69
MW-49	07/01/98	78	<1	15	<1
MW-49	04/20/99	81	<5	32	<10
MW-49	12/08/99	32	68	58	380
MW-49	04/27/00	24	<1	12	<1
MW-49	10/02/00	35	38	18	107
MW-49	04/17/01	21	36	16	117
MW-49	10/31/01	21	<5	<5	<10
MW-49	04/17/02	19	<5	<5	<5
MW-49	10/16/02	31	<5	<5	<5
MW-49	04/08/03	71	<5	<5	<5
MW-49	10/28/03	97	<5	<5	<5
MW-49	04/08/04	76	<5	<5	<5
MW-49	04/25/05	<5	<5	<5	<15
MW-49	04/26/06	23	<2.74	<2.03	<5.81
MW-49	04/20/07	26	<5	<5	<15
MW-49	05/28/09	37	<1	<1	1.2
MW-49	06/23/10	24	<1	<1	<1
MW-58	09/01/91	40	--	--	--
MW-58	12/01/91	90	40	20	80
MW-58	04/01/92	203	32	56	68
MW-58	07/01/92	178	58	32	44
MW-58	10/01/92	190	49	26	57
MW-58	01/01/93	192	30	23	39
MW-58	04/13/93	55	16	31	9
MW-58	07/13/93	25	42	14	13
MW-58	10/13/93	50	21	212	555
MW-58	04/05/94	<2.5	<2.5	7.4	27
MW-58	07/19/94	2	29	4.5	27
MW-58	10/06/94	6.7	<5	15	39
MW-58	04/08/95	2.2	<0.5	2.1	6.8
MW-58	10/01/96	110	320	940	10000

Notes:

Concentrations listed in micrograms per liter (ug/L)

<5 Constituent not detected above noted laboratory detection limit

-- Indicates parameter was not analyzed

Appendix B

Historical BTEX Analytical Data, May 1991 - June 2010

OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Sample Date	Analytical Results			
		Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-58	01/30/98	350	23	42	96
MW-58	06/22/98	22	<1	28	35
MW-66	09/01/91	<1	--	--	--
MW-66	12/01/91	<1	<1	<1	<1
MW-66	04/01/92	4	7	<3	4
MW-66	07/01/92	8	25	7	11
MW-66	10/01/92	12	36	<3	34
MW-66	01/01/93	3	6	3	20
MW-66	04/13/93	<3	5	5	<3
MW-66	07/13/93	8	4	<3	<3
MW-66	10/12/93	13	60	4	29
MW-66	11/10/93	<4	<4	<4	<4
MW-66	01/11/94	<0.5	<0.5	<0.5	0.6
MW-66	04/07/94	<0.5	<0.5	<0.5	<0.5
MW-66	07/19/94	<0.5	0.6	<0.5	0.8
MW-66	10/04/94	<0.5	3	1.5	17
MW-66	01/09/95	<0.5	<0.5	<0.5	<0.5
MW-66	04/11/95	<0.5	<0.5	<0.5	<0.5
MW-66	07/19/95	<0.5	0.9	<0.5	<0.5
MW-66	10/10/95	<0.5	<0.5	<0.5	3.5
MW-66	01/19/96	<0.5	<0.5	<0.5	<0.5
MW-66	04/17/96	<0.5	0.8	<0.5	1
MW-66	07/01/96	<0.5	<0.5	<0.5	0.5
MW-66	10/01/96	<0.5	<0.5	<0.5	<0.5
MW-66	02/05/97	<0.5	<0.5	<0.5	<0.5
MW-66	05/06/97	<0.5	<0.5	<0.5	<0.5
MW-66	07/16/97	<0.5	<0.5	<0.5	<0.5
MW-66	10/15/97	<0.5	<0.5	<0.5	<0.5
MW-66	01/29/98	<0.5	<0.5	<0.5	<0.5
MW-66	04/28/98	<0.5	<0.5	<0.5	<0.5
MW-66	06/17/98	<1	1.6	<1	<1
MW-66	10/11/98	<0.5	<0.5	<0.5	<0.5
MW-66	02/01/99	<0.5	<0.5	<0.5	<0.5
MW-66	04/21/99	<5	<5	<5	<10
MW-66	12/10/99	<5	<5	<5	<10
MW-66	04/27/00	<1	<1	<1	<1
MW-66	10/05/00	<5	<5	<5	<10
MW-66	04/18/01	<5	<5	<5	<15
MW-66	11/01/01	<5	<5	<5	<10
MW-66	04/19/02	<5	<5	<5	<5
MW-66	10/16/02	<5	<5	<5	<5
MW-66	04/08/03	<5	<5	<5	<5
MW-66	10/22/03	<5	<5	<5	<5
MW-66	04/06/04	<5	<5	<5	<5
MW-66	04/21/05	<5	<5	<5	<15
MW-66	04/19/06	<2.57	<2.74	<2.03	<5.81
MW-66	04/18/07	<5	<5	<5	<15
MW-66	05/27/09	<1	<1	<1	<1
MW-66	06/22/10	<1	<1	<1	<1

Notes:

Concentrations listed in micrograms per liter (ug/L)

<5 Constituent not detected above noted laboratory detection limit

-- Indicates parameter was not analyzed

Appendix B

Historical BTEX Analytical Data, May 1991 - June 2010

OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Sample Date	Analytical Results			
		Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-70	09/01/91	<1	--	--	--
MW-70	12/01/91	<1	<1	<1	<1
MW-70	04/01/92	3	17	<3	8
MW-70	07/01/92	<1	3	1	13
MW-70	10/01/92	11	40	63	60
MW-70	01/01/93	<3	<3	8	5
MW-70	04/14/93	9	20	<3	4
MW-70	07/13/93	<1	11	3	<3
MW-70	10/12/93	25	19	19	18
MW-70	11/10/93	<4	<4	<4	40
MW-70	01/11/94	<0.5	0.6	<0.5	<0.5
MW-70	04/06/94	<0.5	<0.5	<0.5	<0.5
MW-70	07/18/94	<0.5	<0.5	<0.5	<0.5
MW-70	10/04/94	1.2	4.3	1.3	12
MW-70	01/09/95	<0.5	2.3	<0.5	2.4
MW-70	04/05/95	<0.5	<0.5	<0.5	1.1
MW-70	07/18/95	<0.5	0.8	<0.5	<0.5
MW-70	10/10/95	<0.5	<0.5	<0.5	<0.5
MW-70	01/18/96	<0.5	<0.5	<0.5	<0.5
MW-70	04/17/96	<0.5	<0.5	<0.5	<0.5
MW-70	07/01/96	<0.5	<0.5	<0.5	<0.5
MW-70	10/01/96	<0.5	<0.5	<0.5	<0.5
MW-70	02/05/97	<0.5	<0.5	<0.5	<0.5
MW-70	10/15/97	<0.5	<0.5	<0.5	<0.5
MW-70	06/16/98	<1	<1	<1	<1
MW-70	04/22/99	<5	<5	<5	<10
MW-70	04/28/00	<1	<1	<1	<1
MW-70	10/03/00	<5	<5	<5	<10
MW-70	04/24/01	<5	<5	<5	<15
MW-70	04/18/02	<5	<5	<5	<5
MW-70	04/06/03	<5	<5	<5	<5
MW-70	04/12/04	<5	<5	<5	<5
MW-70	04/26/05	<5	<5	<5	<15
MW-70	04/20/06	<2.57	<2.74	<2.03	<5.81
MW-70	04/24/07	<5	<5	<5	<15
MW-70	05/27/09	<1	<1	<1	<1
MW-70	06/23/10	<1	<1	<1	<1
MW-77	07/21/95	<0.5	<0.5	1.9	2.8
MW-77	01/20/96	<0.5	3.1	<0.5	7.1
MW-77	04/19/96	<0.5	3.8	0.8	2.5
MW-77	07/01/96	8	14	19	35
MW-77	10/01/96	160	320	150	1000
MW-77	05/07/97	8.4	70	8.3	52
MW-77	07/18/97	14	30	11	71
MW-77	12/09/99	<5	<5	<5	<10
MW-77	10/03/00	<5	<5	<5	24
MW-77	Not Sampled - Condensate Present				
MW-77	Not Sampled - Dry				
MW-77	10/21/02	<5	<5	<5	<5
MW-77	04/10/03	<5	<5	<5	<5
MW-77	10/24/03	<5	<5	<5	<5

Notes:

Concentrations listed in micrograms per liter (ug/L)

<5 *Constituent not detected above noted laboratory detection limit*

-- Indicates parameter was not analyzed

Appendix B

Historical BTEX Analytical Data, May 1991 - June 2010

OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Sample Date	Analytical Results			
		Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-77	04/07/04	<5	<5	<5	<5
MW-77	04/27/05	<5	<5	<5	<15
MW-77	04/26/06	<2.57	<2.74	<2.03	<5.81
MW-77	04/18/07	<5	<5	<5	<15
MW-77	06/23/10	<1	<1	<1	<1
MW-81	06/29/98	<1	<1	<1	1.5
MW-88	08/01/96	<0.5	1.1	0.5	1
MW-88	10/01/96	<0.5	<0.5	<0.5	<0.5
MW-88	02/05/97	<0.5	<0.5	<0.5	<0.5
MW-88	04/30/97	<0.5	<0.5	<0.5	<0.5
MW-88	10/15/97	<0.5	<0.5	<0.5	<0.5
MW-88	01/29/98	<0.5	<0.5	<0.5	<0.5
MW-88	04/28/98	<0.5	<0.5	<0.5	<0.5
MW-88	06/27/98	<1	<1	<1	<1
MW-88	10/11/98	<0.5	<0.5	<0.5	<0.5
MW-88	02/01/99	1.6	1.8	1.6	4.8
MW-88	04/21/99	<5	<5	<5	<10
MW-88	12/10/99	<5	<5	<5	<10
MW-88	04/28/00	<1	<1	<1	<1
MW-88	10/02/00	<5	<5	<5	<5
MW-88	04/17/01	<5	<5	<5	<15
MW-88	10/31/01	<5	<5	<5	<10
MW-88	04/19/02	<5	<5	<5	<5
MW-88	10/16/02	<5	<5	<5	<5
MW-88	04/08/03	<5	<5	<5	<5
MW-88	10/21/03	<5	<5	<5	<5
MW-88	04/06/04	<5	<5	<5	<5
MW-88	04/21/05	<5	<5	<5	<15
MW-88	04/20/06	<2.57	<2.74	<2.03	<5.81
MW-88	04/19/07	<5	<5	<5	<15
MW-88	05/27/09	<1	<1	<1	<1
MW-88	06/22/10	<1	<1	<1	<1
MW-106	02/11/97	<0.5	<0.5	<0.5	<0.5
MW-106	05/07/97	<0.5	<0.5	<0.5	<0.5
MW-106	07/18/97	<0.5	<0.5	<0.5	<0.5
MW-106	04/30/98	<0.5	<0.5	<0.5	<0.5
MW-106	06/28/98	<1	<1	<1	<1
MW-106	04/29/99	<5	<5	<5	<10
MW-106	12/08/99	<5	<5	<5	<10
MW-106	05/01/00	<1	<1	<1	<1
MW-106	10/02/00	<5	<5	<5	<10
MW-106	04/18/01	<5	9.4	<5	<15
MW-106	10/31/01	<5	<5	<5	<10
MW-106	04/17/02	<5	<5	<5	<5
MW-106	10/16/02	<5	7	<5	<5
MW-106	04/09/03	<5	<5	<5	<5
MW-106	10/21/03	<5	<5	<5	<5
MW-106	04/05/04	<5	<5	<5	<5
MW-106	04/20/05	<5	<5	<5	<15
MW-106	04/19/06	<2.57	<2.74	<2.03	<5.81
MW-106	04/18/07	<5	<5	<5	<15

Notes:

Concentrations listed in micrograms per liter (ug/L)

<5 Constituent not detected above noted laboratory detection limit

-- Indicates parameter was not analyzed

Appendix B

Historical BTEX Analytical Data, May 1991 - June 2010

OXY USA WTP Limited Partnership, Indian Basin Gas Plant, Eddy County, New Mexico

Well ID	Sample Date	Analytical Results			
		Benzene	Toluene	Ethylbenzene	Total Xylenes
MW-106	06/23/10	<1	<1	<1	<1
MW-111	06/29/98	<1	<1	<1	<1
MW-111	10/11/98	<0.5	<0.5	<0.5	<0.5
MW-111	02/01/99	<0.5	0.8	<0.5	<0.5
MW-111	04/21/99	<5	<5	<5	<10
MW-111	12/13/99	<5	<5	<5	<10
MW-111	04/27/00	<1	<1	<1	<1
MW-111	10/05/00	<5	<5	<5	<10
MW-111	04/18/01	<5	<5	<5	<15
MW-111	11/02/01	<5	<5	<5	<10
MW-111	04/19/02	<5	<5	<5	<5
MW-111	10/16/02	<5	<5	<5	<5
MW-111	04/07/03	<5	<5	<5	6
MW-111	10/22/03	<5	<5	<5	<5
MW-111	04/07/04	<5	<5	<5	5
MW-111	04/21/05	<5	<5	<5	<15
MW-111	04/19/06	<2.57	<2.74	<2.03	<5.81
MW-111	04/18/07	<5	<5	<5	<15
MW-111	05/27/09	<1	<1	<1	<1
MW-111	06/22/10	<1	<1	<1	<1
MW-113	08/11/99	140	<5	59	390
MW-127	12/28/99	190	7.1	38	16
MW-127	05/28/09	<1	<1	<1	1.4
MW-127	06/23/10	<1	<1	<1	2.2

Notes:

Concentrations listed in micrograms per liter (ug/L)

<5 Constituent not detected above noted laboratory detection limit

-- Indicates parameter was not analyzed

Appendix B
Summary of Analytical Results for All Sampling Events
1991 through 2010
Wet Chemistry

		Wet Chemistry Analytical Data (mg/L)	
	Constituent	*Total Dissolved Solids (TDS)*	Chloride
	New Mexico Standards	1000	250
Station or Well Name	Sample Collection Date		
MW-014	6/22/1998	1400	330
MW-014	4/18/2002	1200	300
MW-014	10/24/2003	1100	150
MW-014 (Dup 1)	10/24/2003	1000	140
MW-014	4/25/2005	1130	230
MW-014 (Dup 1)	4/25/2005	1100	232
MW-014	4/27/2006	1110	209
MW-014 (Dup 1)	4/27/2006	1110	207
MW-014	4/20/2007	1060	196
MW-014 (Dup 1)	4/20/2007	1010	194
MW-045	6/1/1991	5440	507
MW-045	9/1/1991	3920	NA
MW-045	12/1/1991	NA	354
MW-045	7/15/1993	NA	434
MW-045	10/14/1993	NA	408
MW-045	1/13/1994	NA	440
MW-045	4/6/1994	NA	430
MW-045	7/20/1994	NA	429
MW-045	5/29/2009	2540	174
MW-045	6/23/2010	4190	473
MW-046	6/1/1991	1220	152
MW-046	7/1/1991	NA	45
MW-046	10/1/1996	NA	170
MW-046	2/11/1997	NA	220
MW-046	5/29/1997	1300	132
MW-046	7/18/1997	NA	180
MW-046	6/21/1998	940	140
MW-046	4/20/1999	580	31
MW-046	4/28/2000	565	25.8
MW-046	4/19/2001	570	47
MW-046	4/17/2002	490	37
MW-046	4/8/2004	2300	340
MW-046	4/27/2005	1090	116
MW-046	4/23/2007	1770	132
MW-049	6/1/1991	3910	365
MW-049	6/25/1991	NA	NA
MW-049	7/15/1993	NA	399
MW-049	10/14/1993	NA	397
MW-049	1/13/1994	NA	400
MW-049	4/6/1994	NA	380
MW-049	7/20/1994	NA	368
MW-049	10/5/1994	NA	380
MW-049	1/11/1995	NA	389
MW-049	4/6/1995	NA	390
MW-049	7/21/1995	NA	380
MW-049	10/12/1995	NA	350
MW-049	1/20/1996	NA	410
MW-049	4/19/1996	NA	400
MW-049	7/1/1996	NA	360
MW-049	10/1/1996	NA	36
MW-049	2/7/1997	NA	410
MW-049	3/20/1997	3100	NA
MW-049	7/18/1997	NA	350
MW-049	6/21/1998	2800	630
MW-049	4/20/1999	3000	410
MW-049	4/27/2000	3320	379
MW-049	4/17/2001	3100	350
MW-049	4/17/2002	2600	450
MW-049	10/28/2003	2900	570
MW-049	4/9/2004	2900	440
MW-049 (Dup-1)	4/9/2004	3000	410
MW-049	4/25/2005	3960	345
MW-049	4/26/2006	3400	318
MW-049	4/20/2007	2990	325
MW-049	5/28/2009	3090	370
MW-049	6/23/2010	2650	408
MW-058	12/1/1991	NA	124
MW-058	4/1/1992	NA	156

Appendix B
Summary of Analytical Results for All Sampling Events
1991 through 2010
Wet Chemistry

		Wet Chemistry Analytical Data (mg/L)	
	Constituent	Total Dissolved Solids (TDS)	Chloride
	New Mexico Standards	1000	250
MW-058	7/1/1992	NA	149
MW-058	10/1/1992	NA	155
MW-058	1/1/1993	NA	175
MW-058	4/13/1993	NA	133
MW-058	7/13/1993	NA	133
MW-058	10/13/1993	NA	59
MW-058	4/5/1994	NA	48
MW-058	7/19/1994	NA	38
MW-058	10/6/1994	NA	36
MW-058	1/11/1995	NA	26
MW-058	4/8/1995	NA	39
MW-058	4/18/1996	NA	29
MW-058	10/1/1996	NA	38
MW-058	6/22/1998	760	42
MW-058	12/1/1991	NA	124
MW-058	4/1/1992	NA	156
MW-058	7/1/1992	NA	149
MW-058	10/1/1992	NA	155
MW-058	1/1/1993	NA	175
MW-058	4/13/1993	NA	133
MW-058	7/13/1993	NA	133
MW-058	10/13/1993	NA	59
MW-058	4/5/1994	NA	48
MW-058	7/19/1994	NA	38
MW-058	10/6/1994	NA	36
MW-058	1/11/1995	NA	26
MW-058	4/8/1995	NA	39
MW-058	4/18/1996	NA	29
MW-058	10/1/1996	NA	38
MW-058	6/22/1998	760	42
MW-066	12/1/1991	NA	9
MW-066	4/1/1992	NA	8
MW-066	7/1/1991	NA	8
MW-066	10/1/1992	NA	8
MW-066	1/1/1993	NA	12
MW-066	4/13/1993	NA	8
MW-066	7/13/1993	NA	15
MW-066	10/12/1993	NA	7
MW-066	1/1/1994	NA	9
MW-066	4/7/1994	NA	8.7
MW-066	7/19/1994	NA	<5
MW-066	104/94	NA	8.8
MW-066	1/9/1995	NA	6
MW-066	4/11/1995	NA	8.9
MW-066	7/19/1995	NA	8
MW-066	10/10/1995	NA	9
MW-066	1/19/1996	NA	10
MW-066	4/17/1996	NA	9.6
MW-066	7/1/1996	NA	6
MW-066	10/1/1996	NA	7
MW-066	2/5/1997	NA	9
MW-066	5/6/1997	NA	9
MW-066	7/16/1997	NA	8
MW-066	10/15/1997	NA	NA
MW-066	6/17/1998	760	13
MW-066	4/21/1999	730	10
MW-066	4/27/2000	848	8.61
MW-066	4/18/2001	660	9.3
MW-066	4/19/2002	790	8.8
MW-066	10/22/2003	770	8.4
MW-066	4/6/2004	810	8.0
MW-066	4/21/2005	867	10.8
MW-066	4/19/2006	797	11.1
MW-066	4/18/2007	795	10.5
MW-066	5/27/2009	865	8.29
MW-066	6/22/2010	768	9.09
MW-070	12/1/1991	NA	10
MW-070	4/1/1992	NA	8
MW-070	7/1/1992	NA	9.2
MW-070	10/1/1992	NA	17

Appendix B
Summary of Analytical Results for All Sampling Events
1991 through 2010
Wet Chemistry

		Wet Chemistry Analytical Data (mg/L)	
	Constituent	Total Dissolved Solids (TDS)	Chloride
	New Mexico Standards	1000	250
MW-070	1/1/1993	NA	8
MW-070	4/14/1993	NA	8
MW-070	7/13/1993	NA	8
MW-070	10/12/1993	NA	11
MW-070	1/11/1994	NA	10
MW-070	4/6/1994	NA	9.5
MW-070	7/18/1994	NA	8
MW-070	10/4/1994	NA	9.5
MW-070	1/9/1995	NA	9
MW-070	4/5/1995	NA	9.7
MW-070	7/18/1995	NA	9
MW-070	10/10/1995	NA	10
MW-070	1/18/1996	NA	11
MW-070	4/17/1996	NA	9.7
MW-070	7/1/1996	NA	8
MW-070	10/1/1996	NA	10
MW-070	2/5/1997	NA	10
MW-070	10/15/1997	NA	NA
MW-070	6/16/1998	370	12
MW-070	4/22/1999	310	11
MW-070	4/27/2000	385	8.61
MW-070	4/24/2001	270	9.8
MW-070	4/18/2002	310	15
MW-070	10/23/2003	350	10
MW-070	4/12/2004	420	9.9
MW-070	4/26/2005	336	11.6
MW-070	4/20/2006	328	11.5
MW-070	4/24/2007	1150	21.9
MW-070	5/27/2009	508	10.2
MW-070	6/23/2010	350	9.96
MW-077	7/21/1995	NA	110
MW-077	1/20/1996	NA	120
MW-077	4/19/1996	NA	120
MW-077	7/1/1996	NA	100
MW-077	10/1/1996	NA	140
MW-077	5/7/1997	NA	150
MW-077	7/18/1997	NA	150
MW-077	10/24/2003	590	57
MW-077	4/7/2004	550	40
MW-077	4/27/2005	1110	180
MW-077	4/26/2006	521	55
MW-077	6/23/2010	545	48
MW-081	6/29/1998	800	16
MW-088	2/5/1997	970	30
MW-088	4/30/1997	NA	26
MW-088	10/15/1997	NA	NA
MW-088	6/18/1998	840	22
MW-088	4/21/1999	800	24
MW-088	4/28/2000	876	43.1
MW-088	4/17/2001	770	23
MW-088	4/19/2002	750	35
MW-088	10/21/2003	810	22
MW-088	4/6/2004	820	19
MW-088	4/21/2005	945	27.8
MW-088	4/20/2006	780	29.7
MW-088	4/19/2007	861	32.8
MW-088	5/27/2009	937	48.1
MW-088	6/22/2010	919	35.2
MW-106	2/11/1997	430	10
MW-106	5/7/1997	NA	4
MW-106	7/18/1997	NA	5
MW-106	6/18/1998	380	4
MW-106	4/29/1999	NA	12
MW-106	5/1/2000	350	3.45
MW-106	4/18/2001	340	5.6
MW-106	4/17/2002	350	12
MW-106	10/21/2003	350	3.1
MW-106	4/5/2004	540	3.3
MW-106	4/20/2005	405	3.58
MW-106	4/19/2006	371	4.34

Appendix B
Summary of Analytical Results for All Sampling Events
1991 through 2010
Wet Chemistry

		Wet Chemistry Analytical Data (mg/L)	
	Constituent	Total Dissolved Solids (TDS)	Chloride
	New Mexico Standards	1000	250
MW-106	4/18/2007	396	4.17
MW-106	6/23/2010	349	3.12
MW-111	6/29/1998	900	100
MW-111	4/21/1999	760	120
MW-111	4/27/2000	994	103
MW-111	4/18/2001	800	100
MW-111	4/19/2002	750	100
MW-111	10/22/2003	800	98
MW-111	4/7/2004	790	70
MW-111	4/21/2005	932	101
MW-111	4/19/2006	872	88.6
MW-111	4/18/2007	874	86.4
MW-111	5/27/2009	886	67.9
MW-111	6/22/2010	750	70.2
MW-127	5/28/2009	766	77.1
MW-127	6/23/2010	746	44.4

Notes:

NA	No analysis performed
mg/L	Milligrams per liter
1100	Indicates result at/above the applicable standard
<5	Indicates the result is below the specified laboratory detection limit

ARCADIS

Appendix C

Laboratory Analytical Reports
(CD-Rom)

June 2010 Groundwater Sampling
Event

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

ARCADIS U.S., Inc.

Certificate of Analysis Number:

10060846

Report To:		Project Name:	Indian Basin / MT001016.003
ARCADIS U.S., Inc. Alan Reed 1004 N. Big Spring, Suite 300 Midland TX 79701- ph (432) 687-5400 fax:		Site:	Carlsbad, NM
		Site Address:	
		PO Number:	
		State:	Texas
		State Cert. No.:	T104704205-10-4
		Date Reported:	7/1/2010

This Report Contains A Total Of 23 Pages

Excluding This Page, Chain Of Custody

And

Any Attachments

7/1/2010

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Case Narrative for:

ARCADIS U.S., Inc.

Certificate of Analysis Number:

10060846

Report To:		Project Name:	Indian Basin / MT001016.003
ARCADIS U.S., Inc.		Site:	Carlsbad, NM
Alan Reed		Site Address:	
1004 N. Big Spring, Suite 300			
Midland		PO Number:	
TX		State:	Texas
79701-		State Cert. No.:	T104704205-10-4
ph (432) 687-5400	fax:	Date Reported:	7/1/2010

I. SAMPLE RECEIPT:

All samples were received intact. The internal ice chest temperatures were measured on receipt and are recorded on the attached Sample Receipt Checklist.

The pH for your sample "MW-14" (SPL ID: 10060846-09) needed to be adjusted in the lab.

II: ANALYSIS AND EXCEPTIONS:

There were no exceptions noted.

III. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report (" mg\kg-dry " or " ug\kg-dry ").

Matrix spike (MS) and matrix spike duplicate (MSD) samples are chosen and tested at random from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. Since the MS and MSD are chosen at random from an analytical batch, the sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The Laboratory Control Sample (LCS) and the Method Blank (MB) are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

Some of the percent recoveries and RPD's on the QC report for the MS/MSD may be different than the calculated recoveries and RPD's using the sample result and the MS/MSD results that appear on the report because, the actual raw result is used to perform the calculations for percent recovery and RPD.

Any other exceptions associated with this report will be footnoted in the analytical result page(s) or the quality control summary page(s).

Please do not hesitate to contact us if you have any questions or comments pertaining to this data report. Please reference the above Certificate of Analysis Number.

SPL, Inc. is pleased to be of service to you. We anticipate working with you in fulfilling all your current and future analytical needs.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or by his designee, as verified by the following signature.

Alisha C. Rodriguez

Alisha C. Rodriguez
Project Manager

Date

Test results meet all requirements of NELAC, unless specified in the narrative.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

ARCADIS U.S., Inc.

Certificate of Analysis Number:

10060846

Report To: ARCADIS U.S., Inc.
Alan Reed
1004 N. Big Spring, Suite 300

Midland
TX
79701-
ph (432) 687-5400 fax: (432) 687-5401

Fax To:

Project Name: Indian Basin / MT001016.003
Site: Carlsbad, NM
Site Address:

PO Number:
State: Texas
State Cert. No.: T104704205-10-4
Date Reported: 7/1/2010

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-88	10060846-01	Water	06/22/2010 17:00	6/25/2010 9:00:00 AM		☐
MW-66	10060846-02	Water	06/22/2010 18:25	6/25/2010 9:00:00 AM		☐
MW-111	10060846-03	Water	06/22/2010 19:35	6/25/2010 9:00:00 AM		☐
MW-70	10060846-04	Water	06/23/2010 9:30	6/25/2010 9:00:00 AM		☐
MW-106	10060846-05	Water	06/23/2010 11:10	6/25/2010 9:00:00 AM		☐
MW-49	10060846-06	Water	06/23/2010 12:20	6/25/2010 9:00:00 AM		☐
MW-77	10060846-07	Water	06/23/2010 13:40	6/25/2010 9:00:00 AM		☐
MW-46	10060846-08	Water	06/23/2010 14:35	6/25/2010 9:00:00 AM		☐
MW-14	10060846-09	Water	06/23/2010 15:05	6/25/2010 9:00:00 AM		☐
MW-127	10060846-10	Water	06/23/2010 16:35	6/25/2010 9:00:00 AM		☐
MW-45	10060846-11	Water	06/23/2010 17:50	6/25/2010 9:00:00 AM		☐
TB	10060846-12	Water	06/23/2010 0:00	6/25/2010 9:00:00 AM		☐

Alisha C. Rodriguez
Project Manager

7/1/2010
Date

Kesavalu M. Bagawandoss Ph.D., J.D.
Laboratory Director

Ted Yen
Quality Assurance Officer

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-88 **Collected:** 06/22/2010 17:00 **SPL Sample ID:** 10060846-01

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL			**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	35.2		1	1	06/28/10 11:23	ESK	5525715
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1	1	06/29/10 17:28	JSP	5527890
Toluene	ND		1	1	06/29/10 17:28	JSP	5527890
Ethylbenzene	ND		1	1	06/29/10 17:28	JSP	5527890
m,p-Xylene	ND		1	1	06/29/10 17:28	JSP	5527890
o-Xylene	ND		1	1	06/29/10 17:28	JSP	5527890
Xylenes,Total	ND		1	1	06/29/10 17:28	JSP	5527890
Surr: 1,4-Difluorobenzene	98.8		% 70-130	1	06/29/10 17:28	JSP	5527890
Surr: 4-Bromofluorobenzene	105		% 70-130	1	06/29/10 17:28	JSP	5527890
TOTAL DISSOLVED SOLIDS			**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	919		10	1	06/28/10 18:00	ESK	5526875

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-66 **Collected:** 06/22/2010 18:25 **SPL Sample ID:** 10060846-02

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	9.09		1		1	06/28/10 11:23	ESK	5525718
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1		1	06/29/10 17:56	JSP	5527892
Toluene	ND		1		1	06/29/10 17:56	JSP	5527892
Ethylbenzene	ND		1		1	06/29/10 17:56	JSP	5527892
m,p-Xylene	ND		1		1	06/29/10 17:56	JSP	5527892
o-Xylene	ND		1		1	06/29/10 17:56	JSP	5527892
Xylenes,Total	ND		1		1	06/29/10 17:56	JSP	5527892
Surr: 1,4-Difluorobenzene	96.8		% 70-130		1	06/29/10 17:56	JSP	5527892
Surr: 4-Bromofluorobenzene	102		% 70-130		1	06/29/10 17:56	JSP	5527892
TOTAL DISSOLVED SOLIDS				**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	768		10		1	06/28/10 18:00	ESK	5526877

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-111 **Collected:** 06/22/2010 19:35 **SPL Sample ID:** 10060846-03

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	70.2		1		1	06/28/10 11:23	ESK	5525719
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1		1	06/29/10 18:24	JSP	5527893
Toluene	ND		1		1	06/29/10 18:24	JSP	5527893
Ethylbenzene	ND		1		1	06/29/10 18:24	JSP	5527893
m,p-Xylene	ND		1		1	06/29/10 18:24	JSP	5527893
o-Xylene	ND		1		1	06/29/10 18:24	JSP	5527893
Xylenes,Total	ND		1		1	06/29/10 18:24	JSP	5527893
Surr: 1,4-Difluorobenzene	97.5		% 70-130		1	06/29/10 18:24	JSP	5527893
Surr: 4-Bromofluorobenzene	103		% 70-130		1	06/29/10 18:24	JSP	5527893
TOTAL DISSOLVED SOLIDS				**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	750		10		1	06/28/10 18:00	ESK	5526878

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-70 **Collected:** 06/23/2010 9:30 **SPL Sample ID:** 10060846-04

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	9.96		1		1	06/28/10 11:23	ESK	5525720
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1		1	06/30/10 12:11	JSP	5528818
Toluene	ND		1		1	06/30/10 12:11	JSP	5528818
Ethylbenzene	ND		1		1	06/30/10 12:11	JSP	5528818
m,p-Xylene	ND		1		1	06/30/10 12:11	JSP	5528818
o-Xylene	ND		1		1	06/30/10 12:11	JSP	5528818
Xylenes,Total	ND		1		1	06/30/10 12:11	JSP	5528818
Surr: 1,4-Difluorobenzene	96.9		% 70-130		1	06/30/10 12:11	JSP	5528818
Surr: 4-Bromofluorobenzene	102		% 70-130		1	06/30/10 12:11	JSP	5528818
TOTAL DISSOLVED SOLIDS				**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	350		10		1	06/28/10 18:00	ESK	5526879

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-106 **Collected:** 06/23/2010 11:10 **SPL Sample ID:** 10060846-05

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL			**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	3.12		1	1	06/28/10 11:23	ESK	5525721
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1	1	06/30/10 12:39	JSP	5528819
Toluene	ND		1	1	06/30/10 12:39	JSP	5528819
Ethylbenzene	ND		1	1	06/30/10 12:39	JSP	5528819
m,p-Xylene	ND		1	1	06/30/10 12:39	JSP	5528819
o-Xylene	ND		1	1	06/30/10 12:39	JSP	5528819
Xylenes,Total	ND		1	1	06/30/10 12:39	JSP	5528819
Surr: 1,4-Difluorobenzene	97.9		% 70-130	1	06/30/10 12:39	JSP	5528819
Surr: 4-Bromofluorobenzene	103		% 70-130	1	06/30/10 12:39	JSP	5528819
TOTAL DISSOLVED SOLIDS			**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	349		10	1	06/28/10 18:00	ESK	5526880

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-49 **Collected:** 06/23/2010 12:20 **SPL Sample ID:** 10060846-06

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	408		10		10	06/28/10 11:35	ESK	5525726
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	24		1		1	06/30/10 13:07	JSP	5528820
Toluene	ND		1		1	06/30/10 13:07	JSP	5528820
Ethylbenzene	ND		1		1	06/30/10 13:07	JSP	5528820
m,p-Xylene	ND		1		1	06/30/10 13:07	JSP	5528820
o-Xylene	ND		1		1	06/30/10 13:07	JSP	5528820
Xylenes,Total	ND		1		1	06/30/10 13:07	JSP	5528820
Surr: 1,4-Difluorobenzene	98.8		% 70-130		1	06/30/10 13:07	JSP	5528820
Surr: 4-Bromofluorobenzene	99.0		% 70-130		1	06/30/10 13:07	JSP	5528820
TOTAL DISSOLVED SOLIDS				**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	2650		20		2	06/28/10 18:00	ESK	5526881

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-77 **Collected:** 06/23/2010 13:40 **SPL Sample ID:** 10060846-07

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	48		1		1	06/28/10 11:23	ESK	5525722
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1		1	06/30/10 19:08	JSP	5528829
Toluene	ND		1		1	06/30/10 19:08	JSP	5528829
Ethylbenzene	ND		1		1	06/30/10 19:08	JSP	5528829
m,p-Xylene	ND		1		1	06/30/10 19:08	JSP	5528829
o-Xylene	ND		1		1	06/30/10 19:08	JSP	5528829
Xylenes,Total	ND		1		1	06/30/10 19:08	JSP	5528829
Surr: 1,4-Difluorobenzene	98.6		% 70-130		1	06/30/10 19:08	JSP	5528829
Surr: 4-Bromofluorobenzene	102		% 70-130		1	06/30/10 19:08	JSP	5528829
TOTAL DISSOLVED SOLIDS				**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	545		10		1	06/28/10 18:00	ESK	5526882

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-46 **Collected:** 06/23/2010 14:35 **SPL Sample ID:** 10060846-08

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1	1	06/30/10 13:35	JSP	5528821
Toluene	ND		1	1	06/30/10 13:35	JSP	5528821
Ethylbenzene	ND		1	1	06/30/10 13:35	JSP	5528821
m,p-Xylene	ND		1	1	06/30/10 13:35	JSP	5528821
o-Xylene	ND		1	1	06/30/10 13:35	JSP	5528821
Xylenes,Total	ND		1	1	06/30/10 13:35	JSP	5528821
Surr: 1,4-Difluorobenzene	98.2		% 70-130	1	06/30/10 13:35	JSP	5528821
Surr: 4-Bromofluorobenzene	104		% 70-130	1	06/30/10 13:35	JSP	5528821

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-14 **Collected:** 06/23/2010 15:05 **SPL Sample ID:** 10060846-09

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	1.1		1	1	06/30/10 20:32	JSP	5528830
Toluene	ND		1	1	06/30/10 20:32	JSP	5528830
Ethylbenzene	2.9		1	1	06/30/10 20:32	JSP	5528830
m,p-Xylene	5.4		1	1	06/30/10 20:32	JSP	5528830
o-Xylene	14		1	1	06/30/10 20:32	JSP	5528830
Xylenes,Total	19.4		1	1	06/30/10 20:32	JSP	5528830
Surr: 1,4-Difluorobenzene	92.9		% 70-130	1	06/30/10 20:32	JSP	5528830
Surr: 4-Bromofluorobenzene	106		% 70-130	1	06/30/10 20:32	JSP	5528830

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-127 **Collected:** 06/23/2010 16:35 **SPL Sample ID:** 10060846-10

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	44.4		1		1	06/28/10 11:23	ESK	5525723
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1		1	06/30/10 14:03	JSP	5528822
Toluene	ND		1		1	06/30/10 14:03	JSP	5528822
Ethylbenzene	ND		1		1	06/30/10 14:03	JSP	5528822
m,p-Xylene	2.2		1		1	06/30/10 14:03	JSP	5528822
o-Xylene	ND		1		1	06/30/10 14:03	JSP	5528822
Xylenes,Total	2.2		1		1	06/30/10 14:03	JSP	5528822
Surr: 1,4-Difluorobenzene	100		% 70-130		1	06/30/10 14:03	JSP	5528822
Surr: 4-Bromofluorobenzene	106		% 70-130		1	06/30/10 14:03	JSP	5528822
TOTAL DISSOLVED SOLIDS				**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	746		10		1	06/28/10 18:00	ESK	5526883

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID MW-45 **Collected:** 06/23/2010 17:50 **SPL Sample ID:** 10060846-11

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
CHLORIDE, TOTAL				**MCL**	**SM4500-CL E**	**Units: mg/L**		
Chloride	473		10		10	06/28/10 11:45	ESK	5525727
PURGEABLE AROMATICS				**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1		1	06/30/10 14:31	JSP	5528823
Toluene	ND		1		1	06/30/10 14:31	JSP	5528823
Ethylbenzene	ND		1		1	06/30/10 14:31	JSP	5528823
m,p-Xylene	ND		1		1	06/30/10 14:31	JSP	5528823
o-Xylene	ND		1		1	06/30/10 14:31	JSP	5528823
Xylenes,Total	ND		1		1	06/30/10 14:31	JSP	5528823
Surr: 1,4-Difluorobenzene	97.0		% 70-130		1	06/30/10 14:31	JSP	5528823
Surr: 4-Bromofluorobenzene	101		% 70-130		1	06/30/10 14:31	JSP	5528823
TOTAL DISSOLVED SOLIDS				**MCL**	**SM2540 C**	**Units: mg/L**		
Total Dissolved Solids (Residue,Filterable)	4190		40		4	06/28/10 18:00	ESK	5526884

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Client Sample ID TB **Collected:** 06/23/2010 0:00 **SPL Sample ID:** 10060846-12

Site: Carlsbad, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
PURGEABLE AROMATICS			**MCL**	**SW8021B**	**Units: ug/L**		
Benzene	ND		1	1	06/29/10 22:10	JSP	5529292
Toluene	ND		1	1	06/29/10 22:10	JSP	5529292
Ethylbenzene	ND		1	1	06/29/10 22:10	JSP	5529292
m,p-Xylene	ND		1	1	06/29/10 22:10	JSP	5529292
o-Xylene	ND		1	1	06/29/10 22:10	JSP	5529292
Xylenes,Total	ND		1	1	06/29/10 22:10	JSP	5529292
Surr: 1,4-Difluorobenzene	97.8		% 70-130	1	06/29/10 22:10	JSP	5529292
Surr: 4-Bromofluorobenzene	103		% 70-130	1	06/29/10 22:10	JSP	5529292

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
* - Surrogate Recovery Outside Advisable QC Limits
J - Estimated value between MDL and PQL
E - Estimated Value exceeds calibration curve
TNTC - Too numerous to count
>MCL - Result Over Maximum Contamination Limit(MCL)
D - Surrogate Recovery Unreportable due to Dilution
MI - Matrix Interference

Quality Control Documentation

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

ARCADIS U.S., Inc.

Indian Basin / MT001016.003

Analysis: Purgeable Aromatics
Method: SW8021B

WorkOrder: 10060846
Lab Batch ID: R303858

Method Blank

RunID: HP_N_100629B-5527884 Units: ug/L
Analysis Date: 06/29/2010 8:33 Analyst: JSP

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	1.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,4-Difluorobenzene	97.7	70-130
Surr: 4-Bromofluorobenzene	101.7	70-130

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
10060846-01A	MW-88
10060846-02A	MW-66
10060846-03A	MW-111
10060846-12A	TB

Laboratory Control Sample (LCS)

RunID: HP_N_100629B-5527886 Units: ug/L
Analysis Date: 06/29/2010 9:42 Analyst: JSP

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	20.1	100	70	130
Ethylbenzene	20.0	19.3	96.5	70	130
Toluene	20.0	20.1	100	70	130
m,p-Xylene	40.0	38.5	96.2	70	130
o-Xylene	20.0	19.1	95.6	70	130
Xylenes,Total	60.0	ND	96.0	70	130
Surr: 1,4-Difluorobenzene	100	96.3	96.3	70	130
Surr: 4-Bromofluorobenzene	100	102	102	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: H1006065200
RunID: HP_N_100629B-5527894 Units: ug/L
Analysis Date: 06/29/2010 19:49 Analyst: JSP

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

ARCADIS U.S., Inc.

Indian Basin / MT001016.003

Analysis: Purgeable Aromatics
Method: SW8021B
WorkOrder: 10060846
Lab Batch ID: R303858

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	20	21.9	110	20	21.6	108	1.48	31	66	141
Ethylbenzene	ND	20	20.9	105	20	20.7	103	1.26	28	52	136
Toluene	ND	20	22.2	111	20	21.8	109	2.07	25	61	131
m,p-Xylene	ND	40	41.9	105	40	41.2	103	1.60	36	60	130
o-Xylene	ND	20	20.8	104	20	20.5	103	1.33	30	64	130
Xylenes,Total	ND	60	ND	104	60	ND	103	1.51	36	60	130
Surr: 1,4-Difluorobenzene	ND	100	98.3	98.3	100	97.7	97.7	0.598	30	70	130
Surr: 4-Bromofluorobenzene	ND	100	103	103	100	103	103	0.823	30	70	130

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

ARCADIS U.S., Inc.

Indian Basin / MT001016.003

Analysis: Purgeable Aromatics
Method: SW8021B
WorkOrder: 10060846
Lab Batch ID: R303928

Method Blank

RunID: HP_N_100630A-5528816 Units: ug/L
Analysis Date: 06/30/2010 11:43 Analyst: JSP

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	1.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,4-Difluorobenzene	97.1	70-130
Surr: 4-Bromofluorobenzene	101.9	70-130

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
10060846-04A	MW-70
10060846-05A	MW-106
10060846-06A	MW-49
10060846-07A	MW-77
10060846-08A	MW-46
10060846-09A	MW-14
10060846-10A	MW-127
10060846-11A	MW-45

Laboratory Control Sample (LCS)

RunID: HP_N_100630A-5528826 Units: ug/L
Analysis Date: 06/30/2010 16:40 Analyst: JSP

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	18.8	94.2	70	130
Ethylbenzene	20.0	18.0	90.2	70	130
Toluene	20.0	18.8	94.0	70	130
m,p-Xylene	40.0	35.9	89.8	70	130
o-Xylene	20.0	17.9	89.4	70	130
Xylenes,Total	60.0	ND	89.7	70	130
Surr: 1,4-Difluorobenzene	100	97.6	97.6	70	130
Surr: 4-Bromofluorobenzene	100	103	103	70	130

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 10060846-11
RunID: HP_N_100630A-5528824 Units: ug/L
Analysis Date: 06/30/2010 15:44 Analyst: JSP

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

ARCADIS U.S., Inc.

Indian Basin / MT001016.003

Analysis: Purgeable Aromatics **WorkOrder:** 10060846
Method: SW8021B **Lab Batch ID:** R303928

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	20	22.3	111	20	22.0	110	1.28	31	66	141
Ethylbenzene	ND	20	21.5	107	20	21.2	106	1.19	28	52	136
Toluene	ND	20	22.1	110	20	22.3	111	0.881	25	61	131
m,p-Xylene	ND	40	42.6	106	40	42.0	104	1.49	36	60	130
o-Xylene	ND	20	21.6	108	20	21.2	106	1.47	30	64	130
Xylenes,Total	ND	60	ND	106	60	ND	105	1.48	36	60	130
Surr: 1,4-Difluorobenzene	ND	100	97.5	97.5	100	97.4	97.4	0.105	30	70	130
Surr: 4-Bromofluorobenzene	ND	100	103	103	100	103	103	0.0516	30	70	130

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

ARCADIS U.S., Inc.

Indian Basin / MT001016.003

Analysis: Chloride, Total
Method: SM4500-Cl E

WorkOrder: 10060846
Lab Batch ID: R303706

Method Blank

RunID: KONELAB_100628A-5525710 Units: mg/L
Analysis Date: 06/28/2010 11:05 Analyst: ESK

Analyte	Result	Rep Limit
Chloride	ND	1.0

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
10060846-01B	MW-88
10060846-02B	MW-66
10060846-03B	MW-111
10060846-04B	MW-70
10060846-05B	MW-106
10060846-06B	MW-49
10060846-07B	MW-77
10060846-10B	MW-127
10060846-11B	MW-45

Laboratory Control Sample (LCS)

RunID: KONELAB_100628A-55257 Units: mg/L
Analysis Date: 06/28/2010 11:05 Analyst: ESK

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Chloride	50.00	52.73	105.5	80	120

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 10060846-01
RunID: KONELAB_100628A-55257 Units: mg/L
Analysis Date: 06/28/2010 11:23 Analyst: ESK

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Chloride	35.19	50	86.57	102.8	50	86.89	103.4	0.3670	20	76	131

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Quality Control Report

ARCADIS U.S., Inc.

Indian Basin / MT001016.003

Analysis: Total Dissolved Solids
Method: SM2540 C
WorkOrder: 10060846
Lab Batch ID: R303794A

Method Blank

RunID: WET_100628G-5526871 Units: mg/L
Analysis Date: 06/28/2010 18:00 Analyst: ESK

Analyte	Result	Rep Limit
Total Dissolved Solids (Residue,Filterable)	ND	10

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
10060846-01B	MW-88
10060846-02B	MW-66
10060846-03B	MW-111
10060846-04B	MW-70
10060846-05B	MW-106
10060846-06B	MW-49
10060846-07B	MW-77
10060846-10B	MW-127
10060846-11B	MW-45

Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)

RunID: WET_100628G-5526873 Units: mg/L
Analysis Date: 06/28/2010 18:00 Analyst: ESK

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
Total Dissolved Solids (Residue,Filterabl	200.0	201.0	100.5	200.0	198.0	99.00	1.5	10	95	107

Sample Duplicate

Original Sample: 10060846-01
RunID: WET_100628G-5526875 Units: mg/L
Analysis Date: 06/28/2010 18:00 Analyst: ESK

Analyte	Sample Result	DUP Result	RPD	RPD Limit
Total Dissolved Solids (Residue,Filterabl	919	925	0.651	10

Qualifiers:
ND/U - Not Detected at the Reporting Limit
B - Analyte Detected In The Associated Method Blank
J - Estimated Value Between MDL And PQL
E - Estimated Value exceeds calibration curve
MI - Matrix Interference
D - Recovery Unreportable due to Dilution
* - Recovery Outside Advisable QC Limits
N/C - Not Calculated - Sample concentration is greater than 4 times the amount of spike added. Control limits do not apply.
TNTC - Too numerous to count

QC results presented on the QC Summary Report have been rounded. RPD and percent recovery values calculated by the SPL LIMS system are derived from QC data prior to the application of rounding rules.

Sample Receipt Checklist

And

Chain of Custody

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TX 77054
(713) 660-0901

Sample Receipt Checklist

Workorder:	**10060846**	Received By:	**T_B**
Date and Time Received:	**6/25/2010 9:00:00 AM**	Carrier name:	**Fedex-Priority**
Temperature:	**4.0°C**	Chilled by:	**Water Ice**

1.	**Shipping container/cooler in good condition?**	Yes ☑	No ☐	Not Present ☐
2.	**Custody seals intact on shippping container/cooler?**	Yes ☑	No ☐	Not Present ☐
3.	**Custody seals intact on sample bottles?**	Yes ☐	No ☐	Not Present ☑
4.	**Chain of custody present?**	Yes ☑	No ☐	
5.	**Chain of custody signed when relinquished and received?**	Yes ☑	No ☐	
6.	**Chain of custody agrees with sample labels?**	Yes ☑	No ☐	
7.	**Samples in proper container/bottle?**	Yes ☑	No ☐	
8.	**Sample containers intact?**	Yes ☑	No ☐	
9.	**Sufficient sample volume for indicated test?**	Yes ☑	No ☐	
10.	**All samples received within holding time?**	Yes ☑	No ☐	
11.	**Container/Temp Blank temperature in compliance?**	Yes ☑	No ☐	
12.	**Water - VOA vials have zero headspace?**	Yes ☑	No ☐	VOA Vials Not Present ☐
13.	**Water - Preservation checked upon receipt (except VOA*)?**	Yes ☐	No ☐	Not Applicable ☑

***VOA Preservation Checked After Sample Analysis**

SPL Representative: **Contact Date & Time:**

Client Name Contacted:

Non Conformance Issues:

Client Instructions:

1006004[illegible]

ARCADIS
Infrastructure, environment, buildings

ID#:

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order #

Send Results to:

Contact & Company Name: [illegible] ARCADIS	Telephone: 432-687-5400
Address: 1004 N. [illegible] Spring Suite 300	Fax: 432-687-5401
City: [illegible] State: TX Zip: 79701	E-mail Address: [illegible]@arcadis-us.com
Project Name/Location (City, State): [illegible]	Project #: [illegible]001010.0003
Sampler's Printed Name: [illegible]	Sampler's Signature: (signature)

Preservative	E	E							
Filtered (✓)									
# of Containers	3	1							
Container Information	1	2							

PARAMETER ANALYSIS & METHOD

Sample ID	Collection Date	Collection Time	Type Comp	Type Grab	Matrix	BTEX	Chloride TDS							REMARKS
MW-88	6-22-10	1700		✓	W	3	1							
MW-66	6-22-10	1825		✓	W	3	1							
MW-111	6-22-10	1935		✓	W	3	1							
MW-70	6-23-10	0930		✓	W	3	1							
MW-106	6-23-10	1110		✓	W	3	1							
MW-49	6-23-10	1220		✓	W	3	1							
MW-77	6-23-10	1340		✓	W	3	1							
MW-46	6-23-10	1435		✓	W	3								
MW-14	6-23-10	1505		✓	W	2								
MW-127	6-23-10	1635		✓	W	3	1							
MW-45	6-23-10	1750		✓	W	3	1							
TB (Trip Blank)	6-23-10	—	—	—	W	2								
Temp Blank	6-23-10	—	—	—	W	—	—							

Keys

Preservation Key: A. H_2SO_4 B. HCL C. HNO_3 D. NaOH E. None F. Other: ____ G. Other: ____ H. Other: ____

Container Information Key: 1. 40 ml Vial 2. 1 L ~~Amber~~ Plastic 3. 250 ml Plastic 4. 500 ml Plastic 5. Encore 6. 2 oz. Glass 7. 4 oz. Glass 8. 8 oz. Glass 9. Other: ____ 10. Other: ____

Matrix Key: SO - Soil, W - Water, T - Tissue, SE - Sediment, SL - Sludge, A - Air, NL - NAPL/Oil, SW - Sample Wipe, Other: ____

Special Instructions/Comments:

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name: [illegible]	Cooler Custody Seal (✓)	Printed Name: [illegible]	Printed Name:	Printed Name:	Printed Name:
☐ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature: (signature)	Signature: (signature)	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm: ARCADIS	Firm/Courier:	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: ____	Date/Time: 6-24-10 / 1200	Date/Time: 6/25/10 9:00	Date/Time	Date/Time:

20730826 CofC AR Form 01.12.2007 Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS

Appendix D

NMOCD Correspondence

New Mexico Energy, Minerals and Natural Resources Department

Bill Richardson
Governor

Joanna Prukop
Cabinet Secretary
Reese Fullerton
Deputy Cabinet Secretary

Mark Fesmire
Division Director
Oil Conservation Division

February 20, 2009

M. Paul Peacock
Marathon Oil Company
P.O. Box 3128
Houston, TX 77253-3128

RE: Indian Basin Remediation Project Report and Proposed Well Plugging Request for the Marathon's Indian Basin Gas Plant (GW-21)
Eddy County, New Mexico

Dear Mr. Peacock:

The New Mexico Oil Conservation Division (OCD) has reviewed Marathon's report, Evaluation of Natural Attenuation, Indian Basin Remediation Project [IBRP], Eddy County, New Mexico, dated May 12, 2008, and Proposed IBRP Well Plugging Program [Request], dated February 5, 2009. The report and request are substantially acceptable to the OCD. Therefore, the OCD hereby conditionally approves the discontinuance of active remediation at the above-referenced site.

However, at least annual groundwater monitoring for BTEX, TDS and chloride at the 13 proposed wells as specified in the Well Plugging Request plus at an additional two groundwater monitoring wells, MW-81 and MW-113, for a total of 15 wells must continue unless otherwise approved by the OCD. Also, at least semi-annually gauging of depth to groundwater and non-aqueous phase liquid thickness at these 15 wells must continue unless otherwise approved by the OCD. Marathon must continue to submit an annual groundwater monitoring report to the OCD unless otherwise approved by the OCD.

In addition, the material used to plug the 98 (the 100 proposed minus the 2 rejected) groundwater monitoring wells as specified in the Request must be a cement grout with 1% to 3% bentonite. Please submit to the OCD a final plugging report within 180 days of receipt of this letter.

Please be advised that OCD approval of this report and request does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

Thank you for your cooperation in this matter. If you have any questions regarding this matter, please contact Edward Hansen of my staff at 505-476-3489 or edwardj.hansen@state.nm.us.

Sincerely,

Wayne Price
Environmental Bureau Chief

WP:EJH:ejh

cc: OCD; Artesia District Office
Terry Persaud, P.E., Marathon Oil Company, P.O. Box 3128, Houston, TX 77253-3128

From: Hansen, Edward J., EMNRD [mailto:edwardj.hansen@state.nm.us]
Sent: Wednesday, June 17, 2009 12:42 PM
To: Persaud, Terry
Cc: Caudill, Ted L.; Kurki, Vijay K.; Newman, Dennis (Houston); alan.reed@arcadis-us.com; Lowe, Leonard, EMNRD
Subject: GW-21 Plugging Report Approval

RE: "Indian Basin Remediation Project Monitoring Well Plugging Report"
for the Marathon's (now OXY's)
Indian Basin Gas Plant (GW-21)
Unit Letter G, Section 23, T21S, R23E, NMPM, Eddy County, New Mexico
Plugging Report Approval

Dear Mr. Persaud:

The New Mexico Oil Conservation Division (OCD) has received the groundwater monitoring well plugging report for the Indian Basin Gas Plant (GW-21), dated June 11, 2009, and has conducted a review of the report. The plugging report, submitted for the above-referenced site, indicates that Marathon has met the plugging requirements. Therefore, the OCD hereby approves the plugging report. However, the OCD is anticipating the 2009 annual groundwater monitoring report for the remaining 15 monitoring wells this month.

Please be advised that OCD approval of this report does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

If you have any questions regarding this matter, please contact me at 505-476-3489.

Edward J. Hansen
Hydrologist
Environmental Bureau

ARCADIS

Appendix E

USEPA Low-flow Purging and Sampling Procedures

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION II

GROUND WATER SAMPLING PROCEDURE
LOW STRESS (Low Flow) PURGING AND SAMPLING

I. SCOPE & APPLICATION

This Low Stress (or Low-Flow) Purging and Sampling Procedure is the EPA Region II standard method for collecting low stress (low flow) ground water samples from monitoring wells. Low stress Purging and Sampling results in collection of ground water samples from monitoring wells that are representative of ground water conditions in the geological formation. This is accomplished by minimizing stress on the geological formation and minimizing disturbance of sediment that has collected in the well. The procedure applies to monitoring wells that have an inner casing with a diameter of 2.0 inches or greater, and maximum screened intervals of ten feet unless multiple intervals are sampled. The procedure is appropriate for collection of ground water samples that will be analyzed for volatile and semi-volatile organic compounds (VOCs and SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, and microbiological and other contaminants in association with all EPA programs.

This procedure does not address the collection of light or dense non-aqueous phase liquids (LNAPL or DNAPL) samples, and should be used for aqueous samples only. For sampling NAPLs, the reader is referred to the following EPA publications: DNAPL Site Evaluation (Cohen & Mercer, 1993) and the RCRA Ground-Water Monitoring: Draft Technical Guidance (EPA/530-R-93-001), and references therein.

II. METHOD SUMMARY

The purpose of the low stress purging and sampling procedure is to collect ground water samples from monitoring wells that are representative of ground water conditions in the geological formation. This is accomplished by setting the intake velocity of the sampling pump to a flow rate that limits drawdown inside the well casing.

Sampling at the prescribed (low) flow rate has three primary benefits. First, it minimizes disturbance of sediment in the bottom of the well, thereby producing a sample with low turbidity (i.e., low concentration of suspended particles). Typically, this saves time and analytical costs by eliminating the need for collecting and analyzing an additional filtered sample from the same well. Second, this procedure

minimizes aeration of the ground water during sample collection, which improves the sample quality for VOC analysis. Third, in most cases the procedure significantly reduces the volume of ground water purged from a well and the costs associated with its proper treatment and disposal.

III. ADDRESSING POTENTIAL PROBLEMS

Problems that may be encountered using this technique include a) difficulty in sampling wells with insufficient yield; b) failure of one or more key indicator parameters to stabilize; c) cascading of water and/or formation of air bubbles in the tubing; and d) cross-contamination between wells.

Insufficient Yield

Wells with insufficient yield (i.e., low recharge rate of the well) may dewater during purging. Care should be taken to avoid loss of pressure in the tubing line due to dewatering of the well below the level of the pump's intake. Purging should be interrupted before the water level in the well drops below the top of the pump, as this may induce cascading of the sand pack. Pumping the well dry should therefore be avoided to the extent possible in all cases. Sampling should commence as soon as the volume in the well has recovered sufficiently to allow collection of samples. Alternatively, ground water samples may be obtained with techniques designed for the unsaturated zone, such as lysimeters.

Failure to Stabilize Key Indicator Parameters

If one or more key indicator parameters fails to stabilize after 4 hours, one of three options should be considered: a) continue purging in an attempt to achieve stabilization; b) discontinue purging, do not collect samples, and document attempts to reach stabilization in the log book; c) discontinue purging, collect samples, and document attempts to reach stabilization in the log book; or d) Secure the well, purge and collect samples the next day (preferred). The key indicator parameter for samples to be analyzed for VOCs is dissolved oxygen. The key indicator parameter for all other samples is turbidity.

Cascading

To prevent cascading and/or air bubble formation in the tubing, care should be taken to ensure that the flow rate is sufficient to maintain pump suction. Minimize the length and diameter of tubing (i.e., 1/4

or 3/8 inch ID) to ensure that the tubing remains filled with ground water during sampling.

Cross-Contamination

To prevent cross-contamination between wells, it is strongly recommended that dedicated, in-place pumps be used. As an alternative, the potential for cross-contamination can be reduced by performing the more thorough "daily" decontamination procedures between sampling of each well in addition to the start of each sampling day (see Section VII, below).

Equipment Failure

Adequate equipment should be on-hand so that equipment failures do not adversely impact sampling activities.

IV. PLANNING DOCUMENTATION AND EQUIPMENT

- Approved site-specific Field Sampling Plan/Quality Assurance Project Plan (QAPP). This plan must specify the type of pump and other equipment to be used. The QAPP must also specify the depth to which the pump intake should be lowered in each well. Generally, the target depth will correspond to the mid-point of the most permeable zone in the screened interval. Borehole geologic and geophysical logs can be used to help select the most permeable zone. However, in some cases, other criteria may be used to select the target depth for the pump intake. In all cases, the target depth must be approved by the EPA hydrogeologist or EPA project scientist.

- Well construction data, location map, field data from last sampling event.

- Polyethylene sheeting.

- Flame Ionization Detector (FID) and Photo Ionization Detector (PID).

- Adjustable rate, positive displacement ground water sampling pump (e.g., centrifugal or bladder pumps constructed of stainless steel or Teflon). A peristaltic pump may only be used for inorganic sample collection.

- Interface probe or equivalent device for determining the presence or absence of NAPL.

- Teflon or Teflon-lined polyethylene tubing to collect samples for organic analysis. Teflon or Teflon-lined polyethylene, PVC, Tygon or polyethylene tubing to collect samples for inorganic analysis. Sufficient tubing of the appropriate material must be available so that each well has dedicated tubing.

- Water level measuring device, minimum 0.01 foot accuracy, (electronic preferred for tracking water level drawdown during all pumping operations).

- Flow measurement supplies (e.g., graduated cylinder and stop watch or in-line flow meter).

- Power source (generator, nitrogen tank, etc.).
- Monitoring instruments for indicator parameters. Eh and dissolved oxygen must be monitored in-line using an instrument with a continuous readout display. Specific conductance, pH, and temperature may be monitored either in-line or using separate probes. A nephalometer is used to measure turbidity.

- Decontamination supplies (see Section VII, below).

- Logbook (see Section VIII, below).

- Sample bottles.

- Sample preservation supplies (as required by the analytical methods).

- Sample tags or labels, chain of custody.

V. SAMPLING PROCEDURES

Pre-Sampling Activities

1. Start at the well known or believed to have the least contaminated ground water and proceed systematically to the well with the most contaminated ground water. Check the well, the lock, and the locking cap for damage or evidence of tampering. Record observations.

2. Lay out sheet of polyethylene for placement of monitoring and sampling equipment.

3. Measure VOCs at the rim of the unopened well with a PID and FID instrument and record the reading in the field log book.

4. Remove well cap.

5. Measure VOCs at the rim of the opened well with a PID and an FID instrument and record the reading in the field log book.

6. If the well casing does not have a reference point (usually a V-cut or indelible mark in the well casing), make one. Note that the reference point should be surveyed for correction of ground water elevations to the mean geodesic datum (MSL).

7. Measure and record the depth to water (to 0.01 ft) in all wells to be sampled prior to purging. Care should be taken to minimize disturbance in the water column and dislodging of any particulate matter attached to the sides or settled at the bottom of the well.

8. If desired, measure and record the depth of any NAPLs using an interface probe. Care should be taken to minimize disturbance of any sediment that has accumulated at the bottom of the well. Record the observations in the log book. If LNAPLs and/or DNAPLs are detected, install the pump at this time, as described in step 9, below. Allow the well to sit for several days between the measurement or sampling of any DNAPLs and the low-stress purging and sampling of the ground water.

Sampling Procedures

9. Install Pump: Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well in the EPA-approved QAPP or a depth otherwise approved by the EPA hydrogeologist or EPA project scientist. The pump intake must be kept at least two (2) feet above the bottom of the well to prevent disturbance and resuspension of any sediment or NAPL present in the bottom of the well. Record the depth to which the pump is lowered.

10. Measure Water Level: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

11. Purge Well: Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water

level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

12. Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996):

    ±0.1 for pH
    ±3% for specific conductance (conductivity)
    ±10 mv for redox potential
    ±10% for DO and turbidity

    Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.

13. Collect Samples: Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container.

    Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate EPA Program Guidance should be consulted to determine whether pH adjustment is necessary. If pH adjustment is necessary for VOC sample preservation, the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and equal volume of water (e.g., 40 ml). Ground water purged from the well prior to sampling can be used for this purpose.

14. Remove Pump and Tubing: After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.

15. Measure and record well depth.

16. Close and lock the well.

VI. FIELD QUALITY CONTROL SAMPLES

Quality control samples must be collected to determine if sample collection and handling procedures have adversely affected the quality of the ground water samples. The appropriate EPA Program Guidance should be consulted in preparing the field QC sample requirements of the site-specific QAPP.

All field quality control samples must be prepared exactly as regular investigation samples with regard to sample volume, containers, and preservation. The following quality control samples should be collected during the sampling event:

- Field duplicates
- Trip blanks for VOCs only
- Equipment blank (not necessary if equipment is dedicated to the well)

As noted above, ground water samples should be collected systematically from wells with the lowest level of contamination through to wells with highest level of contamination. The equipment blank should be collected after sampling from the most contaminated well.

VII. DECONTAMINATION

Non-disposable sampling equipment, including the pump and support cable and electrical wires which contact the sample, must be decontaminated thoroughly each day before use ("daily decon") and after each well is sampled ("between-well decon"). Dedicated, in-place pumps and tubing must be thoroughly decontaminated using "daily decon" procedures (see #17, below) prior to their initial use. For centrifugal pumps, it is strongly recommended that non-disposable sampling equipment, including the pump and support cable and electrical wires in contact with the sample, be decontaminated thoroughly each day before use ("daily decon").

EPA's field experience indicates that the life of centrifugal pumps may be extended by removing entrained grit. This also permits inspection and replacement of the cooling water in centrifugal pumps. All non-dedicated sampling equipment (pumps, tubing, etc.) must be

decontaminated after each well is sampled ("between-well decon," see #18 below).

17. **Daily Decon**

A) Pre-rinse: Operate pump in a deep basin containing 8 to 10 gallons of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

B) Wash: Operate pump in a deep basin containing 8 to 10 gallons of a non-phosphate detergent solution, such as Alconox, for 5 minutes and flush other equipment with fresh detergent solution for 5 minutes. Use the detergent sparingly.

C) Rinse: Operate pump in a deep basin of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

D) Disassemble pump.

E) Wash pump parts: Place the disassembled parts of the pump into a deep basin containing 8 to 10 gallons of non-phosphate detergent solution. Scrub all pump parts with a test tube brush.

F) Rinse pump parts with potable water.

G) Rinse the following pump parts with distilled/ deionized water: inlet screen, the shaft, the suction interconnector, the motor lead assembly, and the stator housing.

H) Place impeller assembly in a large glass beaker and rinse with 1% nitric acid (HNO_3).

I) Rinse impeller assembly with potable water.

J) Place impeller assembly in a large glass bleaker and rinse with isopropanol.

K) Rinse impeller assembly with distilled/deionized water.

18. **Between-Well Decon**

A) Pre-rinse: Operate pump in a deep basin containing 8 to 10 gallons of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.
B) Wash: Operate pump in a deep basin containing 8 to 10 gallons of a non-phosphate detergent solution, such as Alconox, for 5

minutes and flush other equipment with fresh detergent solution for 5 minutes. Use the detergent sparingly.

C) Rinse: Operate pump in a deep basin of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

D) Final Rinse: Operate pump in a deep basin of distilled/deionized water to pump out 1 to 2 gallons of this final rinse water.

VIII. FIELD LOG BOOK

A field log book must be kept each time ground water monitoring activities are conducted in the field. The field log book should document the following:

- Well identification number and physical condition.
- Well depth, and measurement technique.
- Static water level depth, date, time, and measurement technique.
- Presence and thickness of immiscible liquid layers and detection method.
- Collection method for immiscible liquid layers.
- Pumping rate, drawdown, indicator parameters values, and clock time, at three to five minute intervals; calculate or measure total volume pumped.
- Well sampling sequence and time of sample collection.
- Types of sample bottles used and sample identification numbers.
- Preservatives used.
- Parameters requested for analysis.
- Field observations of sampling event.
- Name of sample collector(s).
- Weather conditions.
- QA/QC data for field instruments.

IX. REFERENCES

Cohen, R.M. and J.W. Mercer, 1993, DNAPL Site Evaluation, C.K. Smoley Press, Boca Raton, Florida.

Puls, R.W. and M.J. Barcelona, 1996, Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures, EPA/540/S-95/504.

U.S. EPA, 1993, RCRA Ground-Water Monitoring: Draft Technical Guidance, EPA/530-R-93-001.

U.S. EPA Region II, 1989, CERCLA Quality Assurance Manual.