

AP-069

Annual GW Report

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April 21, 2010



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Mr. Glenn von Gonten
New Mexico Oil Conservation Division (NMOCD)
1220 South St., Francis Drive
Santa Fe, New Mexico 87505

**RE: 2009 Annual Report for the EPNG San Juan River Plant Project
NMOCD Reference Number: AP-69-0**

Dear Mr. Von Gonten:

MWH Americas, Inc., on behalf of El Paso Natural Gas Company (EPNG) is submitting the enclosed *Final 2009 Annual Report* for the San Juan River Plant project. The report presents the 2009 monitoring data and includes recommendations for 2010 activities at the Site.

If you have any questions or comments concerning the enclosed report, please call either Doug Stavinoha of EPNG (713-420-5150), Ian Yanagisawa (713-420-7361), or myself (303-291-2276).

Sincerely,

Jed Smith
Project Manager

cc: Brandon Powell – NMOCD, Aztec, NM
Doug Stavinoha – EPNG
MWH Project File

**EL PASO NATURAL GAS
COMPANY**

2 North Nevada
Colorado Springs, Colorado 80903

**2009 ANNUAL REPORT
SAN JUAN RIVER PLANT**

APRIL 2010



MWH

1801 California Street
Suite 2900
Denver, Colorado 80202
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LIST OF ACRONYMS

BTEX	Benzene, toluene, ethylbenzene, and total xylenes
EPNG	El Paso Natural Gas Company
mg/L	Milligrams per liter
µg/L	Micrograms per liter
NMOCD	New Mexico Oil Conservation Division
NMWQCC	New Mexico Water Quality Control Commission
ORC	Oxygen-releasing compound
SJRP	San Juan River Plant
TDS	Total dissolved solids
WGR	Western Gas Resources, Inc

EXECUTIVE SUMMARY

The San Juan River Plant (SJRP) is located in San Juan County, near Kirtland, New Mexico. The SJRP processes natural gas collected from production wells located in the San Juan Basin of New Mexico and southern Utah. In June 1992, the SJRP was sold to Western Gas Resources, Inc. (WGR), which is now a wholly owned subsidiary of Anadarko Petroleum Corporation. Closure of evaporation ponds, pits, and other potential source areas within the SJRP occurred from 1992 through 1995. Based on past soil and soil gas investigations, the dissolved phase hydrocarbons are associated with relatively limited soil contamination. Groundwater monitoring has been performed at the SJRP since 1995.

Hydrocarbon impacts to groundwater have been observed primarily in the vicinity of monitoring wells MW-8 and MW-9. Samples from these two wells have consistently indicated that benzene is the only hydrocarbon constituent exceeding the New Mexico Water Quality Control Commission (NMWQCC) groundwater standards. El Paso Natural Gas (EPNG) has accordingly pursued active groundwater remediation, consisting of chemical oxygen enhancement and air sparging, to reduce the dissolved-phase benzene concentrations in this area.

Groundwater monitoring suggests that concentrations in monitoring well MW-8 have generally declined through the use of in-well oxygen-releasing compound socks. MW-8 benzene concentrations during 2009 ranged from non-detect to 0.65J µg/L. The air sparging system at MW-9 was shut down in February 2004 and has remained off throughout 2009 in order to assess groundwater conditions. During this shut-down period, benzene concentrations in MW-9 have rebounded to pre-air sparging levels. In 2009, concentrations of benzene ranged from 55.4 µg/L to 91.3 µg/L. The remediation efforts at monitoring wells MW-8 and MW-9 will continue, as needed, until quarterly sampling results indicate compliance with standards. The remedial efforts will then be suspended and closure monitoring will begin.

The New Mexico Oil Conservation Division (NMOCD) has requested annual monitoring of metals and inorganic parameters in all site monitoring wells as part of the current groundwater monitoring program. Elevated concentrations of some inorganic constituents, including total dissolved solids and sulfate, have historically been detected in various wells. It is possible that these elevated concentrations may be associated with past practices; however, past closure activities have addressed any site-related sources and this region is known to contain elevated total dissolved solids, and sulfate concentrations. There are no known affected downgradient users of the groundwater.

EPNG has initiated a Stage I Abatement Plan to investigate hydrocarbon impacts encountered in groundwater near the Praxair lined pond. The results of the initial investigation were discussed in the Stage I Interim Report, submitted to the NMOCD on March 28, 2006. This report included a work plan for additional investigation activities. In September 2006, EPNG made slight revisions to the work plan and re-submitted it. EPNG is currently awaiting work plan approval from the NMOCD.

1.0 INTRODUCTION

This annual report has been prepared on behalf of El Paso Natural Gas Company (EPNG) to present a summary of physical activities performed, and analytical data collected, at the San Juan River Plant (SJRP) during 2008. This site is located in San Juan County, Township 29N, Range 15W, Section 1, near Kirtland, New Mexico, as shown on **Figure 1**.

Current remedial action at the SJRP is limited to in-situ oxygen enhancement of groundwater through use of oxygen-releasing compound (ORC) in monitoring well MW-8. Dissolved phase groundwater impacts are monitored annually for the entire site and quarterly in the area of MW-8 and MW-9.

Site Description. EPNG owned the SJRP until June 1992. Since that time, the facility has been owned and operated by Western Gas Resources, Inc. (WGR), which is now a wholly owned subsidiary of Anadarko Petroleum Corporation. The plant processes natural gas collected from production wells located in the San Juan Basin of New Mexico and southern Utah. The SJRP is a 630-acre facility that has contained gas processing facilities, two raw water ponds (now closed), three wastewater evaporation ponds (now closed), a sulfur recovery plant, water and hydrocarbon tanks, a pigging station, flare pits, and several 16- to 24-inch-diameter natural gas pipelines that cross the facility. In 2002-2003, the Praxair Nitrogen Plant was built in the area north of the SJRP, to the south of monitoring wells MW-8 and MW-9. **Figure 2** presents a detailed site map of the SJRP. Closure of the evaporation ponds, flare pits, and other potential contaminant source areas was completed from 1992 through 1995. Groundwater has been monitored at this site since 1995.

Report Organization. This report is organized into six sections and supporting appendices. Section 2.0 provides a discussion of the SJRP project history. Section 3.0 includes a summary of field activities conducted at the SJRP during 2008, and Section 4.0 provides a discussion of results. Conclusions and recommendations are provided in Section 5.0, and references are listed in Section 6.0.

2.0 PROJECT HISTORY

The SJRP was previously owned by EPNG, but was sold to WGR on June 19, 1992. Investigation and remediation activities conducted at the SJRP have included the following components:

- Several investigations were conducted at the SJRP between 1985 and 1995. As a result, 24 monitoring wells have been installed at various locations at the plant.
- The north and south flare pits were closed in 1992 after removing 18,200 cubic yards (cy) and 3,520 cy of contaminated material from the north and south pits, respectively.
- The former wastewater evaporation ponds were closed during 1995 and early 1996. The pit and pond closure activities included capping the ponds with compacted, low-permeability soils.
- EPNG abandoned 17 monitoring wells, upgraded two wells, installed five new monitoring wells, and conducted a soil gas investigation during the summer of 1995. Results of the soil gas investigation indicated shallow hydrocarbon contamination near monitoring wells MW-8 and MW-9.
- EPNG submitted a groundwater remediation work plan to the NMOCD in January 2001 to address elevated benzene in monitoring wells MW-8 and MW-9, and received approval to begin remedial actions on June 4, 2001. The work plan included provisions to install an air sparging system with two air sparging wells; one injection point located within 10 feet of each monitoring well.
- The air sparging system air injection wells (SW-8 and SW-9) were installed on October 30, 2001. Both wells were developed on November 12, 2001.
- A pre-pilot air sparging test was conducted at both wells on November 13, 2001. Results from this test indicated good communication between SW-9 and MW-9 but poor communication between SW-8 and MW-8.
- Because of poor communication between SW-8 and MW-8, an ORC sock consisting of magnesium peroxide and manufactured by Regenesys, Inc., was recommended for remediation in this area. The ORC sock was installed in MW-8 on November 14, 2001.
- The air sparging pilot test was initiated on November 14, 2001. With the exception of a 48-hour shutdown prior to the four-week sampling event on December 26, 2001, the air sparging system operated continuously from November 14, 2001 to January 18, 2002. The air sparging pilot test culminated with a sampling event on January 25, 2002. An additional sampling event was performed on February 21, 2002, to evaluate the potential for contaminant concentration rebound following a four-week shutdown.
- From February 2002 through December 2002, site activities included continued operation and maintenance (O&M) of the air sparging system, which was placed into

continuous operation following the pilot test, and site-wide annual groundwater monitoring.

- During 2003, site activities included periodic O&M of the air sparging system, replacement of ORC socks into MW-8, quarterly sampling of MW-8 and MW-9, and site-wide annual groundwater monitoring.
- Based on benzene, toluene, ethylbenzene and total xylenes (BTEX) concentrations below New Mexico Water Quality Control Commission (NMWQCC) standards, the air sparging system was shut down in February 2004 to assess static groundwater conditions at the site.
- During 2004 through 2006, site activities included replacement of ORC socks into MW-8, quarterly sampling of MW-8 and MW-9, and site-wide annual groundwater monitoring.
- EPNG submitted a Stage I Abatement Plan to NMOCD in November 2005 to investigate hydrocarbon impacts encountered in groundwater near the Praxair evaporation pond at the SJRP. Approval was received on January 23, 2006 to begin investigative actions. Results of this investigation are detailed in the Stage I Interim Report, submitted March 28, 2006, which recommended that further investigation be conducted via hollow-stem auger, as the effectiveness of direct push technology at the site was found to be limited.
- The air sparge system has remained off since system shut down in 2004. Site activities for 2007 included quarterly sampling of MW-8 and MW-9, and site-wide annual groundwater monitoring.
- In May 2007, monitoring well MW-7, which was located immediately adjacent to the Praxair facility, was plugged and abandoned at Praxair's request, in order to facilitate new process construction.
- During the May 2008 sampling event, field personnel noted that monitoring well MW-5 had been destroyed in conjunction with subsurface coal mining activities. Destruction of the well is believed to have occurred between February and May 2008.
- Site activities for 2009 included quarterly sampling of MW-8 and MW-9, site-wide annual groundwater monitoring, and annual ORC sock replacement in MW-8.

3.0 SUMMARY OF 2009 ACTIVITIES

The current environmental program at the SJRP consists of dissolved-phase hydrocarbon remediation (oxygen enhancement) and site-wide groundwater monitoring. The following section details site activities conducted at the SJRP during 2009.

3.1 GROUNDWATER MONITORING PROGRAM

The groundwater monitoring program included the following components during 2009:

- Remediation monitoring wells MW-8 and MW-9 were sampled quarterly in February, May, August, and December 2009 and analyzed for BTEX compounds to evaluate the effectiveness of both previous and ongoing hydrocarbon remediation activities in this area.
- On August 28, 2009, Site monitoring wells MW-4, MW-6, MW-8, MW-9, and MW-2 were sampled for BTEX compounds, NMWQCC metals, total dissolved solids (TDS), alkalinity, nitrate/nitrite, chloride, and sulfate.
- Site-wide groundwater elevation measurements were collected quarterly at each well.

All groundwater monitoring activities during 2009 were conducted by Lodestar Services, LLC. Laboratory analyses were performed by Accutest Laboratories in Houston, Texas.

3.2 HYDROCARBON REMEDIATION

Since 2002, dissolved phase hydrocarbon remediation activities at the SJRP have included oxygen enhancement using ORC socks in MW-8 and air sparging in the vicinity of MW-9. The following paragraphs describe remediation activities performed in 2009.

ORC Enhancement. The ORC socks in MW-8 were replaced November 4, 2009. Dissolved oxygen was measured in MW-8 at the time of the February and May quarterly sampling events, and again on November 2, 2009 immediately after pulling the ORC socks. The dissolved oxygen concentration during the sampling events ranged from 86 to 91 percent of saturation (or approximately 7.1 to 7.6 mg/L); and the dissolved oxygen concentration on November 2, 2009 was 18.5 mg/L, indicating that sufficient oxygen was available for biodegradation. In addition, BTEX concentrations in MW-8 were below their respective NMWQCC standards throughout 2009. ORC socks will generally be replaced annually, or as-needed, based on periodic monitoring of dissolved oxygen and BTEX concentrations in this well.

Air Sparging System. As described in **Section 2.0**, air sparging has not been conducted at the site since January 2004. Pending additional source material investigation in the vicinity of MW-8 and MW-9, the system will remain off.

4.0 DISCUSSION OF 2009 RESULTS

This section describes the results of activities conducted at the SJRP during 2009.

4.1 SITE-WIDE GROUNDWATER MONITORING RESULTS

Groundwater Elevation Monitoring. Groundwater elevation maps for each quarter are presented in **Figures 3** through **6**. In general, groundwater flows radially outward from the topographic rise on which the SJRP is located. In the north plant area, groundwater flows towards the northwest. Groundwater beneath the southern portion of the plant generally flows to the southwest. Field documentation for water level monitoring activities is presented in **Appendix A**.

BTEX Sampling Results. **Figures 9, 10, and 11** depict long-term trends in the three wells with detectable BTEX concentrations (i.e., MW-5 – which was destroyed, MW-8, and MW-9). BTEX results from annual samples collected during August 2009 are presented in **Table 1** and on **Figure 5**. During the annual sampling event, BTEX concentrations in monitoring wells W-2, MW4, and MW-6, were below analytical detection limits. These results are consistent with the results from 2002 through 2008. Results from MW-8 and MW-9 are discussed in **Section 4.2**, along with the other quarterly sampling results. Documentation of 2009 field activities is included in **Appendix A**, and the analytical laboratory reports are included in **Appendix B**.

Inorganic Sampling Results. Results for inorganic samples collected during 2009 are presented in **Table 2**. Elevated concentrations of some inorganic constituents, including TDS and sulfate, were detected in various wells. This finding is consistent with previous annual sampling events. Isoconcentration maps presenting TDS and sulfate concentrations for samples collected during August 2009 are shown on **Figures 7 and 8**, respectively. It is possible that these elevated concentrations may be associated with past practices; however, past closure activities have addressed any site-related sources of these constituents, and this region is known to contain elevated inorganic concentrations. Documentation of field activities and laboratory reports are presented in **Appendix A** and **Appendix B**, respectively.

4.2 QUARTERLY SAMPLING RESULTS

Quarterly groundwater sampling results are shown on **Table 1** and on **Figures 3** through **6**. During 2009, benzene concentrations in MW-8 remained below the NMWQCC standard. Static water levels in this well continue to decline rapidly, likely in association with the subsurface coal mining activities.

Benzene concentrations in MW-9 have remained above standards (91.3 µg/L, 55.4 µg/L, 63.1 µg/L, and 69.4 µg/L) during each respective quarter. These results indicate that air sparging in the area was effective when operational and that continued remediation would help to further reduce BTEX concentrations. However, it is unclear whether or not sparging would be able to remediate the area sufficiently to prevent rebounding. Air sparging will be re-evaluated following the pending additional investigation activities.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are provided based on the information presented in this report.

5.1 SITE-WIDE GROUNDWATER MONITORING PROGRAM

Groundwater sampling performed as part of the site-wide groundwater monitoring at SJRP resulted in the following conclusions and recommendations:

- Groundwater flows radially away from the topographic rise on which SJRP is located. In the north plant area, groundwater flow is towards the northwest; in the south plant area, groundwater flow is primarily towards the southwest.
- The remaining groundwater impacts in excess of BTEX standards appear to be in the area near MW-9.
- Consistent with historic monitoring, inorganic constituents were measured above NMWQCC standards during the August 2009 sampling event. The elevated concentrations of TDS and sulfate may result from past site practices; however, it is likely that some elevated concentrations are naturally occurring in the region.
- Monitoring well MW-5 was destroyed during the spring of 2008. Due to its location down gradient of MW-8 and MW-9, replacement of this well is recommended, once ground shifting due to underground mining activity has ceased and a clear trend in static groundwater level elevations has been established. BTEX concentrations in this well have historically been below the NMWQCC standards.
- EPNG recommends continuation of the annual site-wide groundwater monitoring program.

5.2 HYDROCARBON REMEDIATION PROGRAM

The following conclusions and recommendations are provided regarding the hydrocarbon remediation performed near wells MW-8 and MW-9:

- Benzene concentrations in MW-9 have remained above standards. However, the benzene concentrations in MW-8 were non-detect during 2009.
- EPNG recommends continuation of quarterly monitoring at MW-8 and MW-9 for BTEX concentrations.
- ORC socks will be replaced in MW-8, as needed, based on periodic monitoring of dissolved oxygen and BTEX concentrations.
- In November 2005, EPNG submitted a Stage I Abatement Plan to NMOCD to investigate hydrocarbon impacts encountered in groundwater near the Praxair evaporation pond at the SJRP. Approval of this abatement plan was received from NMOCD on January 23, 2006, and the investigation was performed in February 2006. Results of the initial investigation were detailed in the Stage I Interim Report submitted by March 28, 2006. Revisions to the work plan for additional investigation

included in the Stage I Interim Report were submitted on September 28, 2006. The MW-9 area will be evaluated following the additional investigation activities.

6.0 REFERENCES

- AE Schmidt Environmental, 2002. *Air Sparge Pilot Test Data, San Juan River Plant, Kirtland, NM*, prepared for Montgomery Watson Harza, Inc., Albuquerque, New Mexico, February 2002.
- EI Paso Energy Corporation, November 27, 2001. Electronic communication from Mr. Scott Pope (EPNG) to Mr. William Olson, New Mexico Oil Conservation Division, *Proposal to install an Oxygen Release Compound (ORC) sock for oxygenation of MW-8 in lieu of sparging*, documenting conversation between the parties on November 26, 2001.
- EI Paso Energy Corporation, September 19, 2001. Letter to Mr. William Olson, New Mexico Oil Conservation Division, *Revised Work Plan for Groundwater Remediation for the San Juan River Plant*.
- EI Paso Energy Corporation, January 24, 2001. Letter to Mr. William Olson, New Mexico Oil Conservation Division, RE: *Work Plan for Groundwater Remediation and 2000 Groundwater Sample Results for the San Juan River Plant*.
- EI Paso Energy, November 19, 1992. *Summary of Analytical Data from the San Juan River Plant*: Memorandum from N.K. Prince, Environmental Affairs, to S. D. Miller.
- MWH, 2002. *2001 Annual Report San Juan River Plant*. March 2002.
- MWH, 2003. *2002 Annual Report San Juan River Plant*. April 2003.
- MWH, 2004. *2003 Annual Report San Juan River Plant*. March 2004.
- MWH, 2005. *2004 Annual Report San Juan River Plant*. March 2005.
- MWH, 2006. *2005 Annual Report San Juan River Plant*. March 2006.
- MWH, 2006. *Stage I Abatement Plan Interim Report – Investigation Update*. March 2006.
- MWH, 2006. *Proposed Workplan for Additional Phase I Investigation of Potential Hydrocarbon Impacts as Part of a Stage I Abatement Plan at the San Juan River Plant, San Juan Basin, New Mexico*. Revised September 2006.

MWH, 2007. *2006 Annual Report San Juan River Plant*. March 2007.

MWH, 2008. *2007 Annual Report San Juan River Plant*. April 2008.

MWH, 2009. *2008 Annual Report San Juan River Plant*. April 2009.

New Mexico Oil Conservation Division, October 13, 1999. Letter from NMOCD requiring annual groundwater sampling.

New Mexico Oil Conservation Division, June 4, 2001. Letter to Mr. Scott Pope, El Paso Energy Corporation, Case #GW039R, *Groundwater Monitoring Results and Remediation Work Plan*, San Juan River Plant, Kirtland, New Mexico.

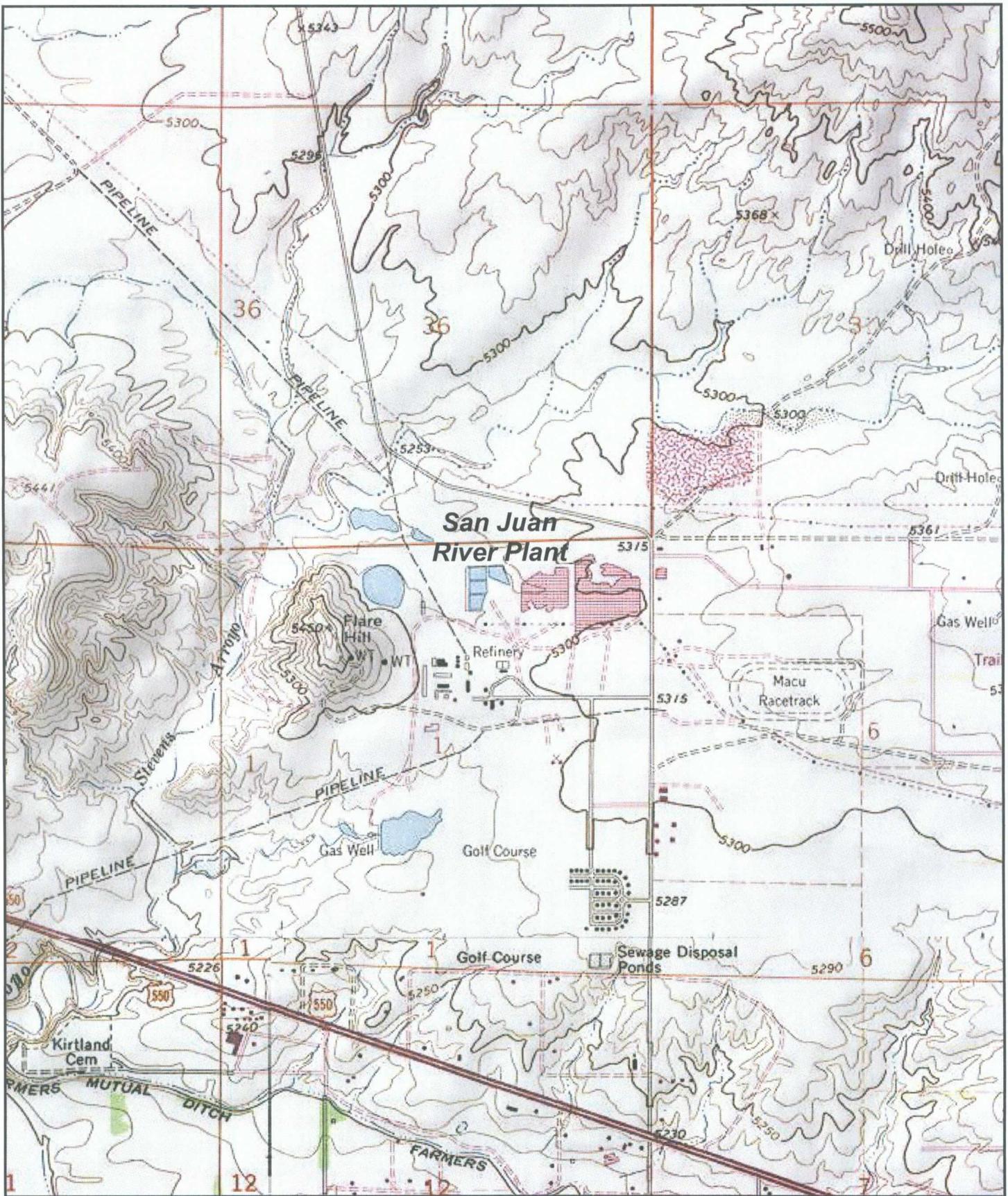
New Mexico Oil Conservation Division, January 23, 2006. Letter to Mr. Scott Pope, El Paso Energy Corporation, Case #GW039R, *Stage 1 Abatement Plan Proposal El Paso Natural Gas – San Juan River Plant/ Praxair Nitrogen Plant*, San Juan River Plant, Kirtland, New Mexico.

Philip Services Corporation, 2000. *San Juan River Plant: Groundwater Remediation Work Plan, Prepared for El Paso Natural Gas*, Farmington, New Mexico, December 2000.

Philip Environmental, 1998. *Summary of Investigations at the San Juan River Plant, Kirtland, New Mexico*, prepared for El Paso Natural Gas Company, Farmington, New Mexico, June 1998.

Philip Environmental, 1995. *Soil-Gas and Soil Survey, San Juan River Plant, Kirtland, New Mexico*, prepared for El Paso Natural Gas Company, Farmington, New Mexico, August 1995.

FIGURES

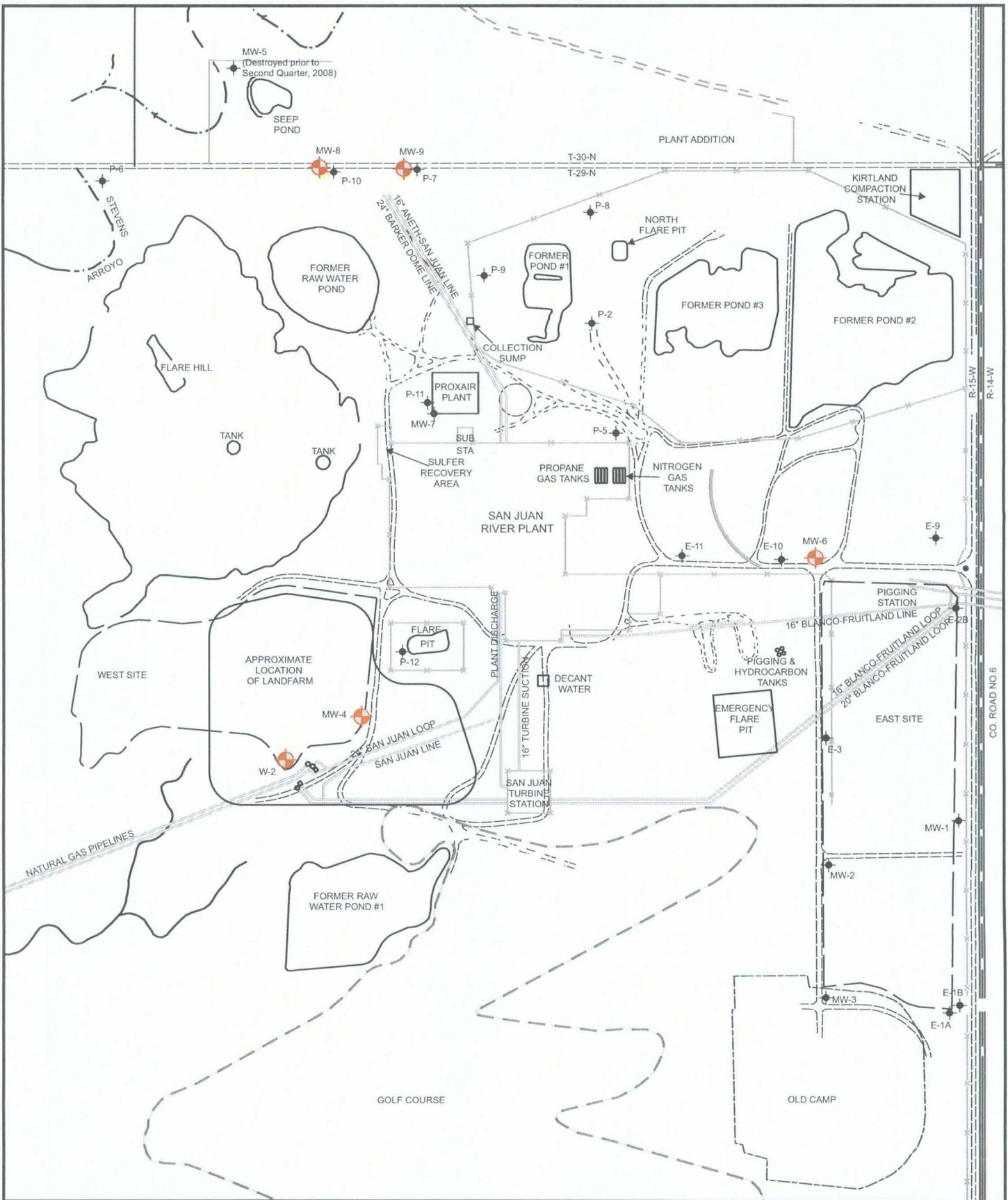


SOURCE

National Geographic TOPOI, 2003, National Geographic Holdings, Inc.,
 USGS Topographic maps, Youngs Lake NM Quad



 	PROJECT: SAN JUAN RIVER PLANT	FIGURE: 1
	TITLE: Site Location Map	



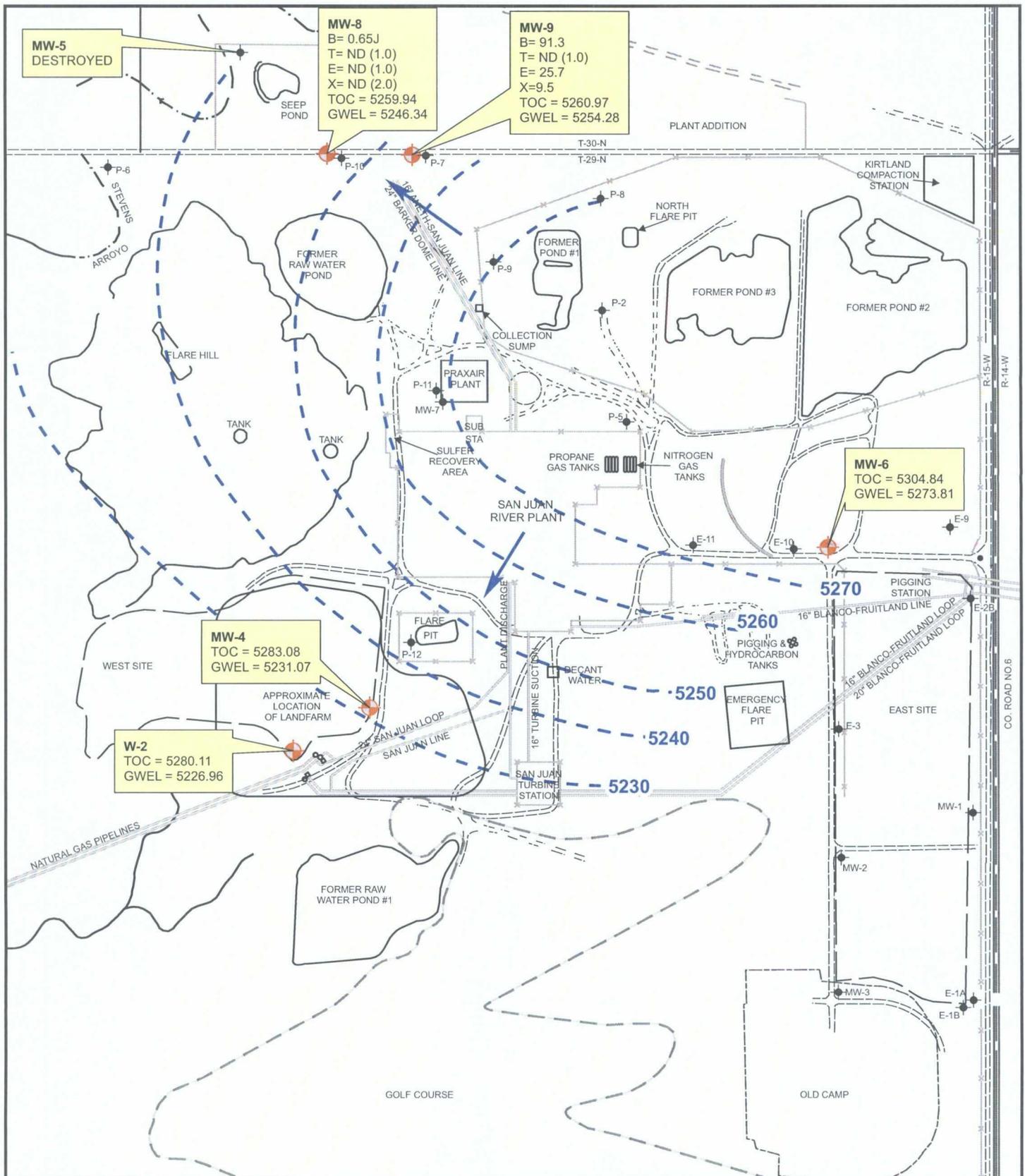
LEGEND

- MW-4  Existing Monitoring / Observation Well
- PZ-01  Abandoned Monitoring Well



PROJECT: SAN JUAN RIVER PLANT
 TITLE: Site Layout Map

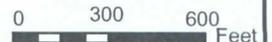
FIGURE:
 2



LEGEND

- MW-4 Existing Monitoring / Observation Well
- P-01 Abandoned Monitoring Well
- Groundwater Flow Direction
- Potentiometric Surface Contour (Inferred Where Dashed)
- ND Not Detected; Reporting Limit Shown In Parenthesis

- B** Benzene (ug/L)
- T** Toluene (ug/L)
- E** Ethylbenzene (ug/L)
- X** Total Xylenes (ug/L)
- TOC** Top of Casing (ft. AMSL)
- GWEL** Groundwater Elevation (ft. AMSL)

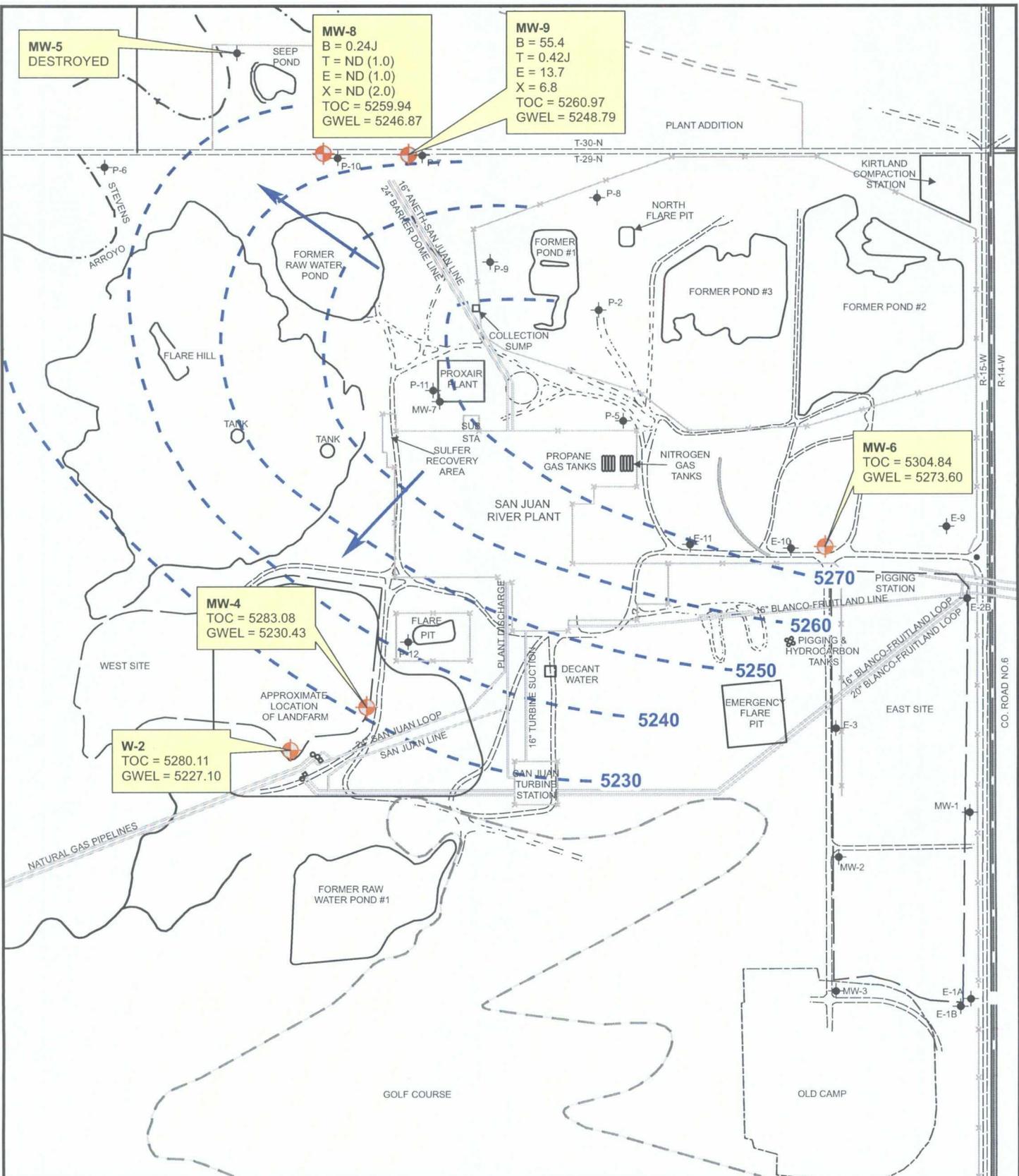


PROJECT: SAN JUAN RIVER PLANT

TITLE: Groundwater Potentiometric Surface Map, and BTEX Concentrations - February 18, 2009

FIGURE:

3



MW-8
 B = 0.24J
 T = ND (1.0)
 E = ND (1.0)
 X = ND (2.0)
 TOC = 5259.94
 GWEL = 5246.87

MW-9
 B = 55.4
 T = 0.42J
 E = 13.7
 X = 6.8
 TOC = 5260.97
 GWEL = 5248.79

MW-5 DESTROYED

MW-6
 TOC = 5304.84
 GWEL = 5273.60

MW-4
 TOC = 5283.08
 GWEL = 5230.43

W-2
 TOC = 5280.11
 GWEL = 5227.10

LEGEND

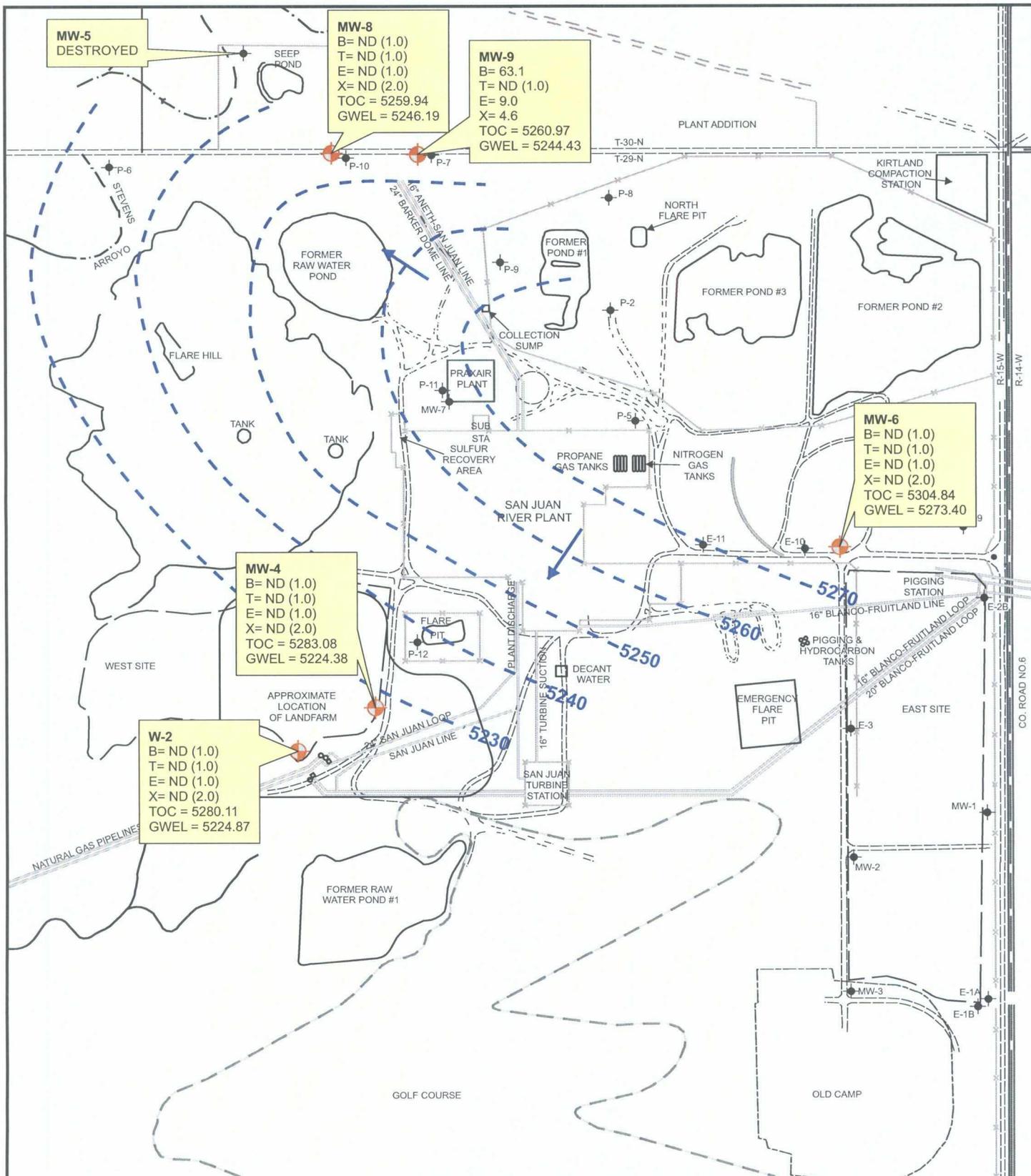
- MW-4 Existing Monitoring / Observation Well
- P-01 Abandoned Monitoring Well
- Groundwater Flow Direction
- Potentiometric Surface Contour (Inferred Where Dashed)
- ND Not Detected; Reporting Limit Shown In Parenthesis

- B Benzene (ug/L)
- T Toluene (ug/L)
- E Ethylbenzene (ug/L)
- X Total Xylenes (ug/L)
- TOC Top of Casing (ft. AMSL)
- GWEL Groundwater Elevation (ft. AMSL)



PROJECT: SAN JUAN RIVER PLANT
 TITLE: Groundwater Potentiometric Surface Map, and BTEX Concentrations - May 5, 2009

FIGURE: 4



LEGEND

- MW-4 Existing Monitoring / Observation Well
- P-01 Abandoned Monitoring Well
- Groundwater Flow Direction
- 1275- Potentiometric Surface Contour (Inferred Where Dashed)
- ND Not Detected; Reporting Limit Shown In Parenthesis

- B Benzene (ug/L)
- T Toluene (ug/L)
- E Ethylbenzene (ug/L)
- X Total Xylenes (ug/L)
- TOC Top of Casing (ft. AMSL)
- GWEL Groundwater Elevation (ft. AMSL)

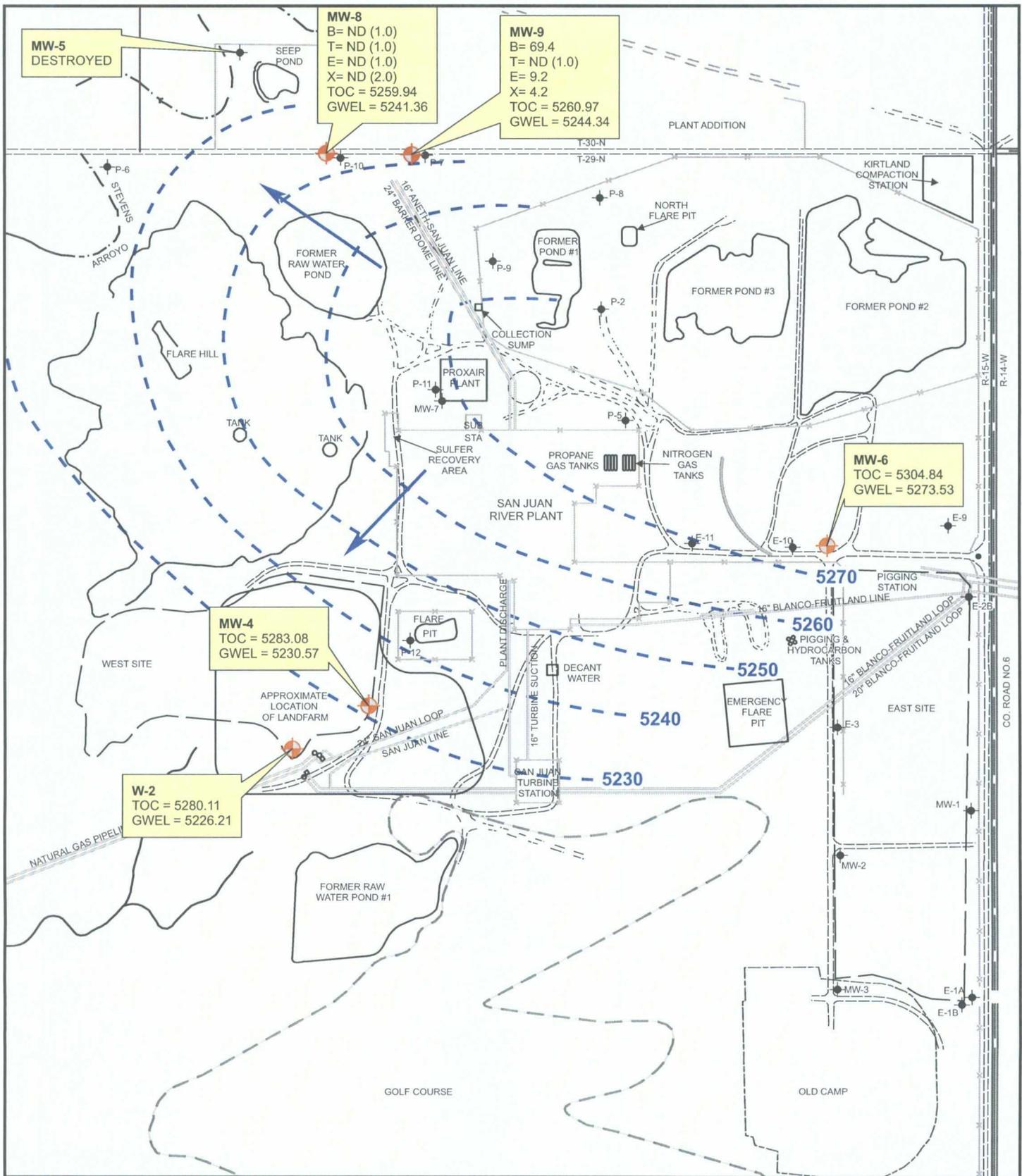


PROJECT: SAN JUAN RIVER PLANT

TITLE: Groundwater Potentiometric Surface Map, and BTEX Concentrations - August 28, 2009

FIGURE:

5



MW-8
 B= ND (1.0)
 T= ND (1.0)
 E= ND (1.0)
 X= ND (2.0)
 TOC = 5259.94
 GWEL = 5241.36

MW-9
 B= 69.4
 T= ND (1.0)
 E= 9.2
 X= 4.2
 TOC = 5260.97
 GWEL = 5244.34

MW-5
 DESTROYED

MW-6
 TOC = 5304.84
 GWEL = 5273.53

MW-4
 TOC = 5283.08
 GWEL = 5230.57

W-2
 TOC = 5280.11
 GWEL = 5226.21

LEGEND

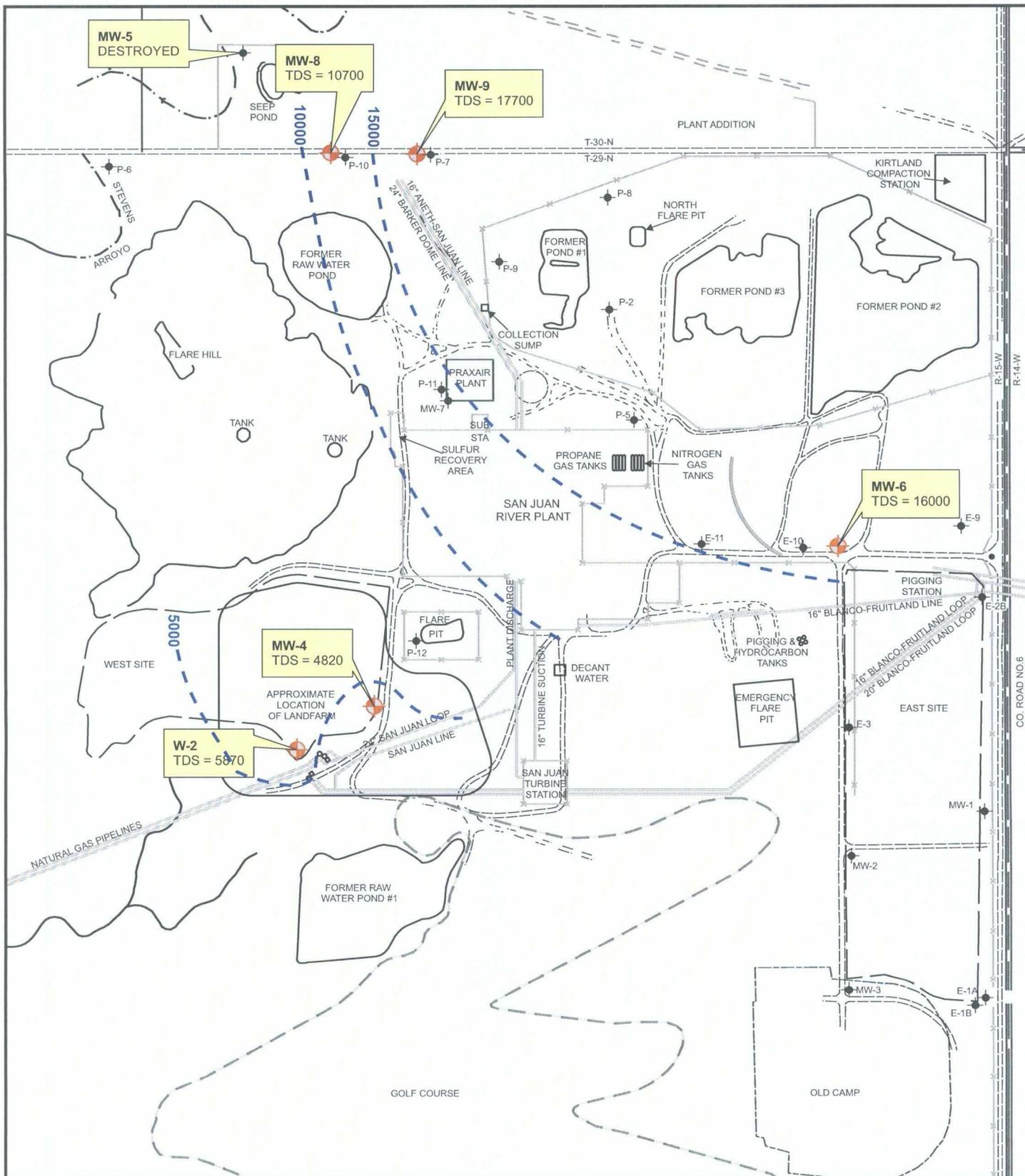
- MW-4 Existing Monitoring / Observation Well
- P-01 Abandoned Monitoring Well
- Groundwater Flow Direction
- Potentiometric Surface Contour (Inferred Where Dashed)
- ND Not Detected; Reporting Limit Shown In Parenthesis

- B Benzene (ug/L)
- T Toluene (ug/L)
- E Ethylbenzene (ug/L)
- X Total Xylenes (ug/L)
- TOC Top of Casing (ft. AMSL)
- GWEL Groundwater Elevation (ft. AMSL)



PROJECT: SAN JUAN RIVER PLANT
 TITLE: Groundwater Potentiometric Surface Map, and BTEX Concentrations - November 4, 2009

FIGURE:
6



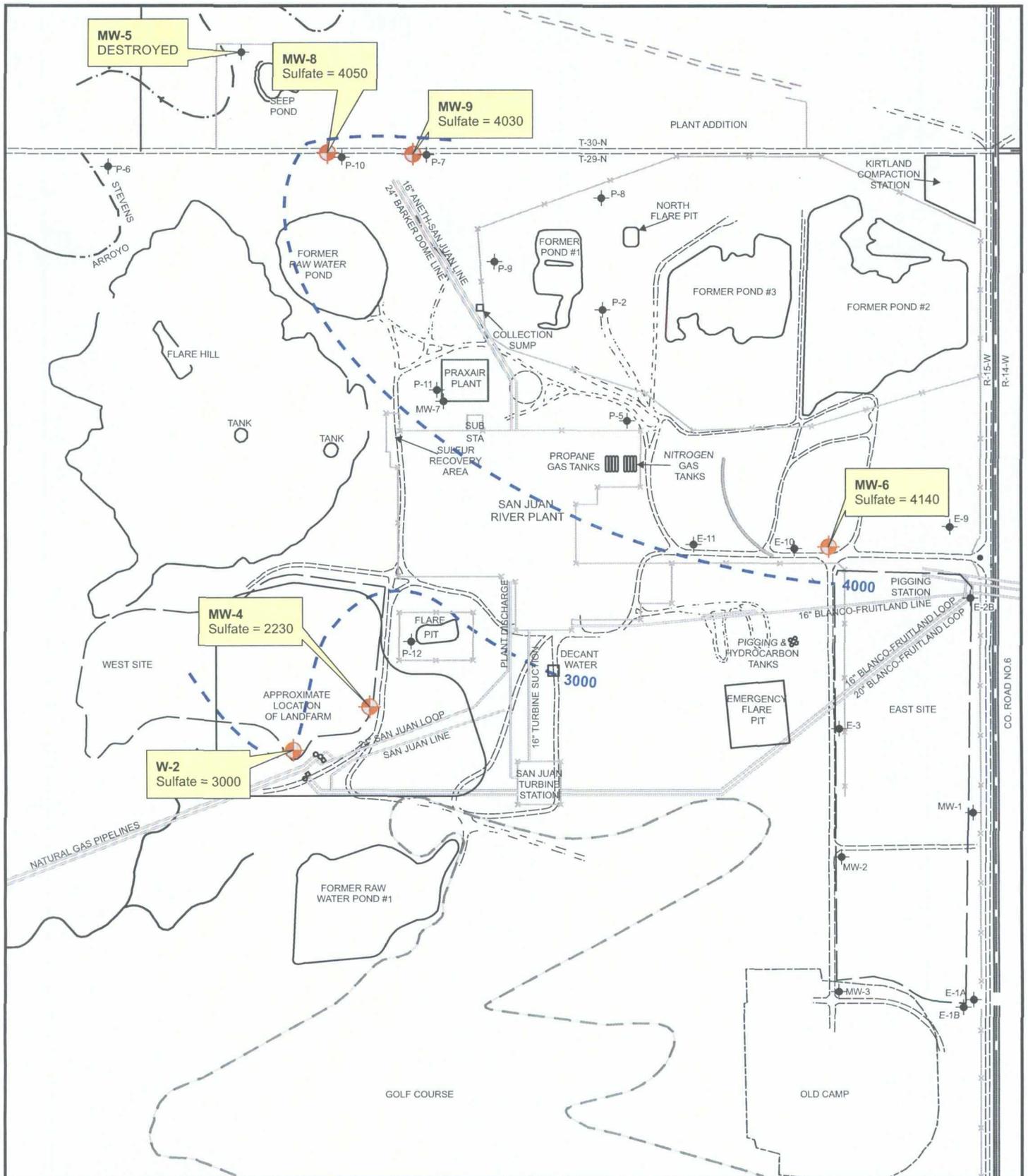
LEGEND

- MW-4 Existing Monitoring / Observation Well
- PZ-01 Abandoned Monitoring Well
- TDS Total Dissolved Solids Concentration in ppm
- 1275— Total Dissolved Solids Isoconcentrations (Inferred Where Dashed)



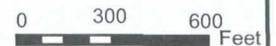
PROJECT: SAN JUAN RIVER PLANT
 TITLE: TDS Isoconcentration Map - August 28, 2009

FIGURE:
 7



LEGEND

- MW-4  Existing Monitoring / Observation Well
- PZ-01  Abandoned Monitoring Well
- Sulfate Sulfate Concentration in ppm
- 1275— Total Dissolved Solids Isoconcentrations (Inferred Where Dashed)



PROJECT: SAN JUAN RIVER PLANT

TITLE: Sulfate Isoconcentration Map, - August 28, 2009

FIGURE:

8



FIGURE 9
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS AND FLUID LEVELS
SAN JUAN RIVER PLANT
MW05

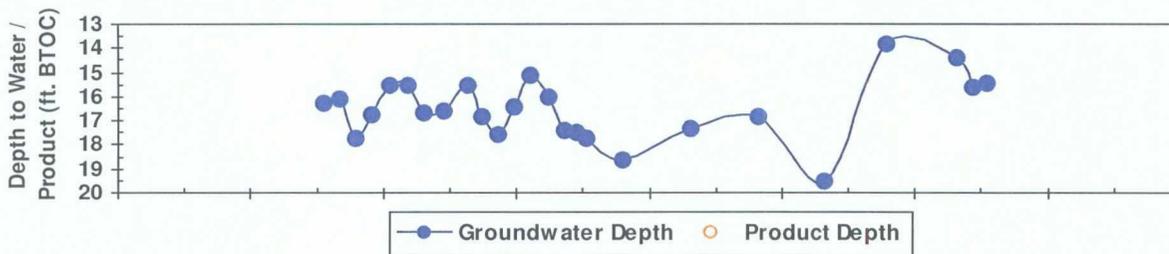
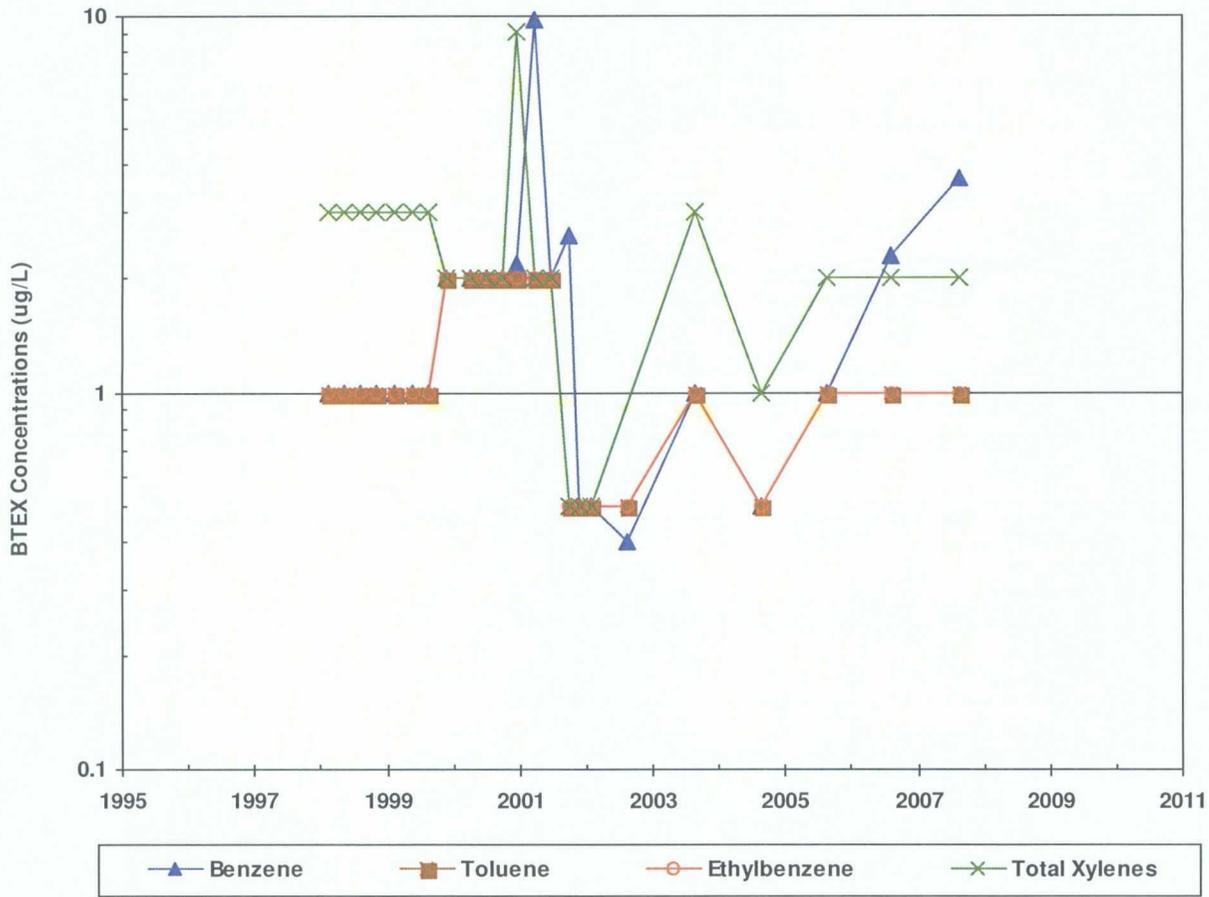


FIGURE 10
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS AND FLUID LEVELS
SAN JUAN RIVER PLANT
MW08

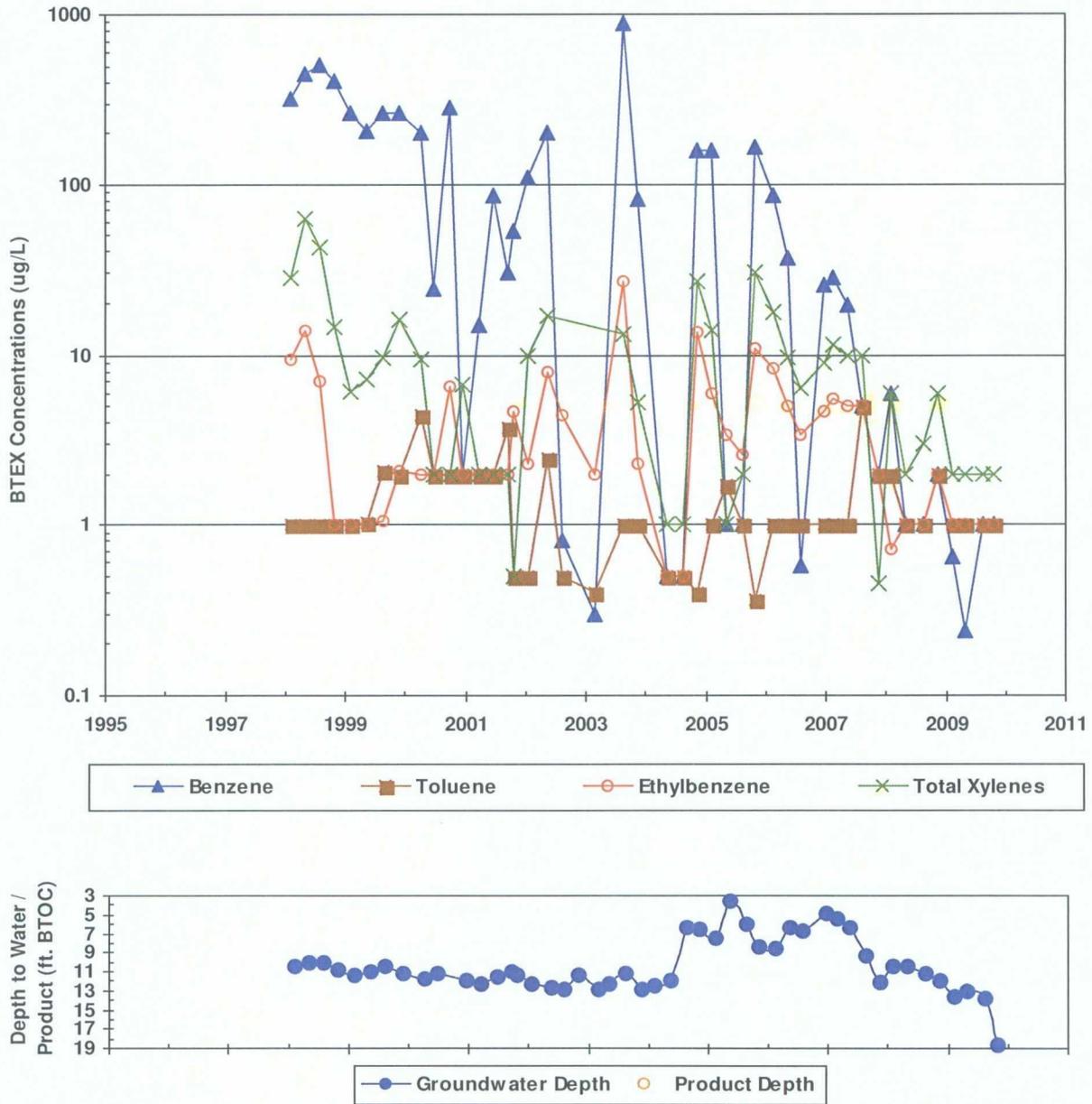
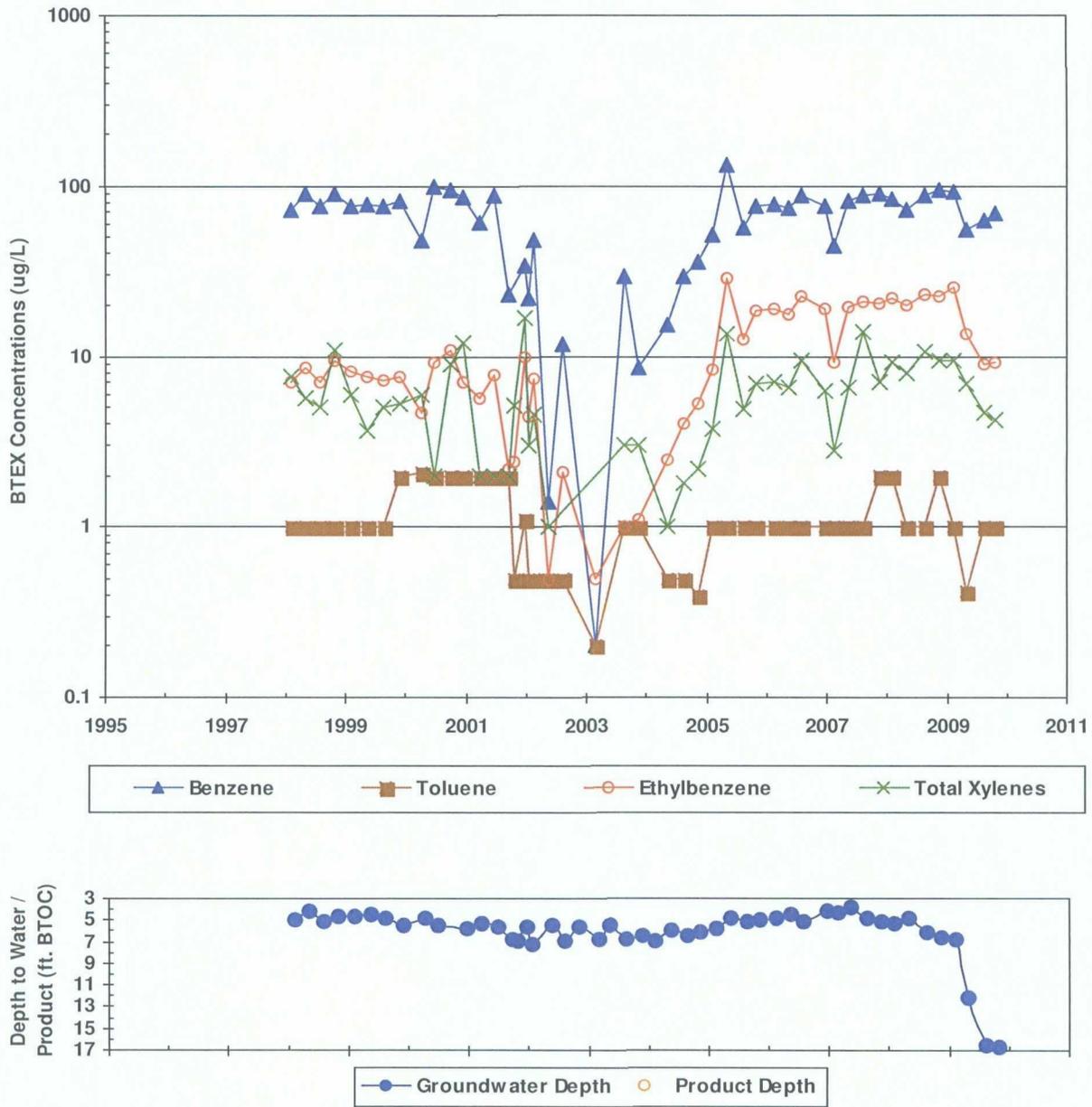


FIGURE 11
SUMMARY OF GROUNDWATER BTEX CONCENTRATIONS AND FLUID LEVELS
SAN JUAN RIVER PLANT
MW09



TABLES

TABLE 1
SUMMARY OF 2009 GROUNDWATER ANALYTICAL DATA
SAN JUAN RIVER PLANT SITE

Parameter	NMWQCC Standard	W-2	MW-4	MW-6	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9
		8/28/2009	8/28/2009	8/28/2009	2/18/2009	5/5/2009	8/28/2009	11/4/2009	2/18/2009	5/5/2009	8/28/2009	11/4/2009	
Volatile Organics (µg/L)													
Benzene	10	<1.0	<1.0	<1.0	0.65J	0.24J	<1.0	<1.0	91.3	55.4	63.1	69.4	
Ethylbenzene	750	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	25.7	13.7	9	9.2	
Toluene	750	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.42J	<1.0	<1.0	
m,p-Xylene	NE	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	9.5	6.8	4.6	4.2	
o-Xylene	NE	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Total Xylenes	620	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	9.5	6.8	4.6	4.2	
Metals (µg/L)													
Aluminum	5,000	21,000	1000	16,800	--	--	5,340	--	--	--	14,700	--	--
Arsenic	100	<5.0	12.5	<5.0	--	--	12.2	--	--	--	<5.0	--	--
Barium	1,000	<200	<200	<200	--	--	<200	--	--	--	<200	--	--
Cadmium	10	<4.0	<4.0	9.5	--	--	<4.0	--	--	--	6.3	--	--
Calcium	NE	356,000	234,000	359,000	--	--	34,300	--	--	--	314,000	--	--
Chromium	50	12.7	<10	<10	--	--	13	--	--	--	<10	--	--
Cobalt	50	<50	75.2	176	--	--	<50	--	--	--	228	--	--
Copper	1,000	27.2	33.4	38.3	--	--	<25	--	--	--	43	--	--
Iron	1,000	16,500	8,160	3,440	--	--	3,070	--	--	--	8,930	--	--
Lead	50	8.9	14	4.4	--	--	3.9	--	--	--	6.5	--	--
Magnesium	NE	110,000	101,000	315,000	--	--	373,000	--	--	--	245,000	--	--
Manganese	200	268	6,400	6,830	--	--	869	--	--	--	8,300	--	--
Mercury	2	<1.0	<1.0	<1.0	--	--	<1.0	--	--	--	<1.0	--	--
Molybdenum	1,000	<10	<10	<10	--	--	32.1	--	--	--	<10	--	--
Nickel	200	<40	199	228	--	--	<40	--	--	--	336	--	--
Potassium	NE	10,200	8,130	34,800	--	--	85,600	--	--	--	24,600	--	--
Selenium	50	132	<5.0	381	--	--	<5.0	--	--	--	<5.0	--	--
Silver	50	<10	<10	<10	--	--	<10	--	--	--	<10	--	--
Sodium	NE	1,130,000	1,020,000	3,470,000	--	--	2,850,000	--	--	--	3,930,000	--	--
Zinc	10,000	98.1	<20	592	--	--	23.4	--	--	--	604	--	--
Inorganics (mg/L)													
Alkalinity	NE	174	428	6	--	--	3,860	--	--	--	30	--	--
Chloride	250	795	373	1,290	--	--	<1.0	--	--	--	1,440	--	--
Nitrate+Nitrite	10	17.7	0.64	97.8	--	--	1.2	--	--	--	<0.10	--	--
Sulfate	600	3,000	2,230	4,140	--	--	4,050	--	--	--	4,030	--	--
TDS	1,000	5,870	4,820	16,000	--	--	10,700	--	--	--	17,700	--	--

NE = Not established

Bold = Parameter concentration exceeds the applicable New Mexico Water Quality Control Commission Groundwater Standard