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2009 AGWMR

MAY 2010

3R071

2009 ANNUAL GROUNDWATER MONITORING REPORT

CONOCOPHILLIPS COMPANY

JOHNSTON FEDERAL NO. 4 METERING STATION SAN JUAN COUNTY, NEW MEXICO

OCD # 3RP-71

API 30-045-10130

Prepared for:

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May 2010

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ANNUAL GROUNDWATER MONITORING REPORT JOHNSTON FEDERAL NO. 4 METERING STATION, SAN JUAN COUNTY, NEW MEXICO

1.0 INTRODUCTION

This report presents the results of an annual groundwater monitoring event conducted by Tetra Tech, Inc. (Tetra Tech) in September 2009 at the ConocoPhillips Company Johnston Federal No. 4 Metering Station located on Bureau of Land Management (BLM) land, approximately 13 miles east-northeast of Aztec, San Juan County, New Mexico in Unit Letter M, Section 27, Township 31N, Range 9W (**Figure 1**). A Site detail map is included as **Figure 2**. The Johnston Federal No. 4 wellhead, API # 30-045-10130, is located approximately one-half mile to the southwest of the metering station. A Site detail map is included as **Figure 2**.

1.1 Site Background

A historical timeline for the Site is presented in **Table 1**, and is discussed in more detail below.

Burlington Resources (Burlington) conducted initial site assessments of two Burlington production pits in August 1998. Soil from the separator pit was collected and analyzed for total petroleum hydrocarbons (TPH). The concentration of TPH in separator pit (Production Pit #1, **Figure 2**) soils was found to be below New Mexico Oil Conservation Division (OCD) recommended action levels for this constituent, and this pit was subsequently granted a closed status by OCD. Soil from the tank drain pit (Production Pit #2, **Figure 2**) was collected and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and for TPH. Concentrations of these constituents were found to be above OCD recommended action levels. Following these laboratory results, excavation of approximately 3,055 cubic yards of hydrocarbon-impacted soil occurred in December 1998. Once complete, the excavation was backfilled with clean fill material, and this pit was closed by OCD. In May 1999, a groundwater monitoring well was installed at the Site to a depth of 50 feet below ground surface (bgs); the screened interval was placed from 35 to 50 feet bgs and groundwater was encountered at a depth of approximately 43 feet bgs. From May 1999 to August 2008, the existing monitor well network consisted of this single Monitor Well MW-1, which was sampled on a quarterly basis by Burlington Resources (Burlington Resources was acquired by ConocoPhillips in March of 2006). It should be noted that there are three additional monitoring wells on-site that are owned by El Paso Natural Gas that are not sampled by Tetra Tech, and the monitoring schedule of these wells is unknown. In August 2008, three additional groundwater monitoring wells (MW-2, MW-3 and MW-4) were installed by WDC Exploration and Drilling of Peralta, NM (WDC), under the supervision of Tetra Tech. Monitoring Wells MW-2, MW-3 and MW-4 were first sampled on October 24, 2008, and have been incorporated into an annual monitoring schedule along with Monitoring Well MW-1. A generalized geologic cross section for the Site is presented as **Figure 3**.

2.0 MONITORING SUMMARY AND SAMPLING METHODOLOGY / RESULTS

Annual groundwater sampling of Monitor Wells MW-1, MW-2, MW-3 and MW-4 was conducted by Tetra Tech in September 2009. Prior to sampling, depth to groundwater in each well was determined, and results are displayed in **Table 2**. The casings for all ConocoPhillips Company monitoring wells at the Site were surveyed in April 2009, with the top of casing for MW-1 assigned an arbitrary reference elevation of 100 feet above mean sea level (amsl). Depth to groundwater in each monitor well was coupled with the Site survey data to create a groundwater elevation map (**Figure 4**). Using these data, it was determined that the groundwater flow direction at the Site is to the east/southeast. The groundwater sampling methodology and analytical results from the September 2009 sampling event are summarized in the following sections.

2.1 Groundwater Sampling Methodology

During the annual groundwater monitoring event, Site monitoring wells were purged of at least 3 casing volumes of groundwater using a 1.5-inch diameter, poly-vinyl chloride disposable bailer. While bailing each well, groundwater parameter data such as temperature, pH, conductivity, total dissolved solids (TDS), oxidation-reduction potential (ORP) and dissolved oxygen (DO) were collected using a YSI 556 multi-parameter sonde. Field parameter data was recorded on a Tetra Tech Water Sampling Field Form (**Appendix A**). Collected groundwater samples were placed in laboratory prepared bottles, packed on ice, and shipped with chain-of-custody documentation. Analysis of all groundwater samples collected during the September 2009 groundwater monitoring event was performed by Southern Petroleum Laboratory (SPL) of Houston, Texas. All excess groundwater generated during purging and collecting of analytical samples was disposed of in the on-site produced water tank.

During the September 2009 sampling event, groundwater samples collected from MW-1, MW-2, MW-3 and MW-4 were analyzed for the presence of BTEX and naphthalene by EPA Method 8260B, for sulfate by EPA Method 300.0, and for dissolved iron and dissolved manganese by EPA Method 6010B. Results of these analyses are displayed in **Table 3**.

2.2 Groundwater Sampling Analytical Results

The New Mexico Water Quality Control Commission (NMWQCC) mandates that groundwater quality in New Mexico be protected, and has issued groundwater quality standards in Title 20, Chapter 6, Part 2, Section 3103 of the New Mexico Administrative Code (20.6.2.3103 NMAC). Groundwater quality standards have been set for the protection of human health, domestic water supply, and irrigation use.

Groundwater concentrations exceeded the New Mexico Water Quality Control Commission (NMWQCC) standard for:

- benzene (10 micrograms per liter [µg/L]), toluene (750 µg/L), and total xylenes (620 µg/L) in Monitor Well MW-1;

- naphthalene (40 µg/L) in Monitor Well MW-1;
- dissolved manganese (0.2 mg/L) in MW-1, MW-3 and MW-4;
- and sulfate (600 mg/L) in MW-2, MW-3 and MW-4.

The corresponding laboratory analysis report for the September 2009 sampling event, including quality control summaries, are included in **Appendix B**. A BTEX concentration map for the September 2009 sampling event is included as **Figure 5**.

3.0 CONCLUSIONS AND RECOMMENDATIONS

BTEX concentrations did not exceed NMWQCC groundwater quality standards in Monitor Wells MW-2, MW-3, or MW-4, while MW-1 continues to reveal evidence of hydrocarbon impacts. Tetra Tech will continue to collect groundwater samples from these wells in order to move toward Site closure. Concentrations of sulfate, dissolved manganese, and naphthalene have been detected above NMWQCC groundwater quality standards in Site monitor wells. As a result, Tetra Tech recommends that sulfate, dissolved manganese, and naphthalene be incorporated into the annual monitoring program for all Site groundwater monitor wells.

As stated in the Johnston Federal No. 4 Metering Station Annual 2008 Groundwater Monitoring Report, if a constituent of concern other than BTEX was found to be below NMWQCC groundwater quality standards during the 2009 annual sampling event, sampling of these constituents will be discontinued. Since results for dissolved iron in all site monitoring wells was below the NMWQCC standard, this constituent will not be analyzed during future sampling events.

The next monitoring event at the Johnston Federal No. 4 Metering Station is scheduled to take place during September of 2010 and will include analyses for BTEX, naphthalene, dissolved manganese and sulfate.

Please contact Kelly Blanchard at 505-237-8440 or kelly.blanchard@tetratech.com if you have any questions or require additional information.

FIGURES

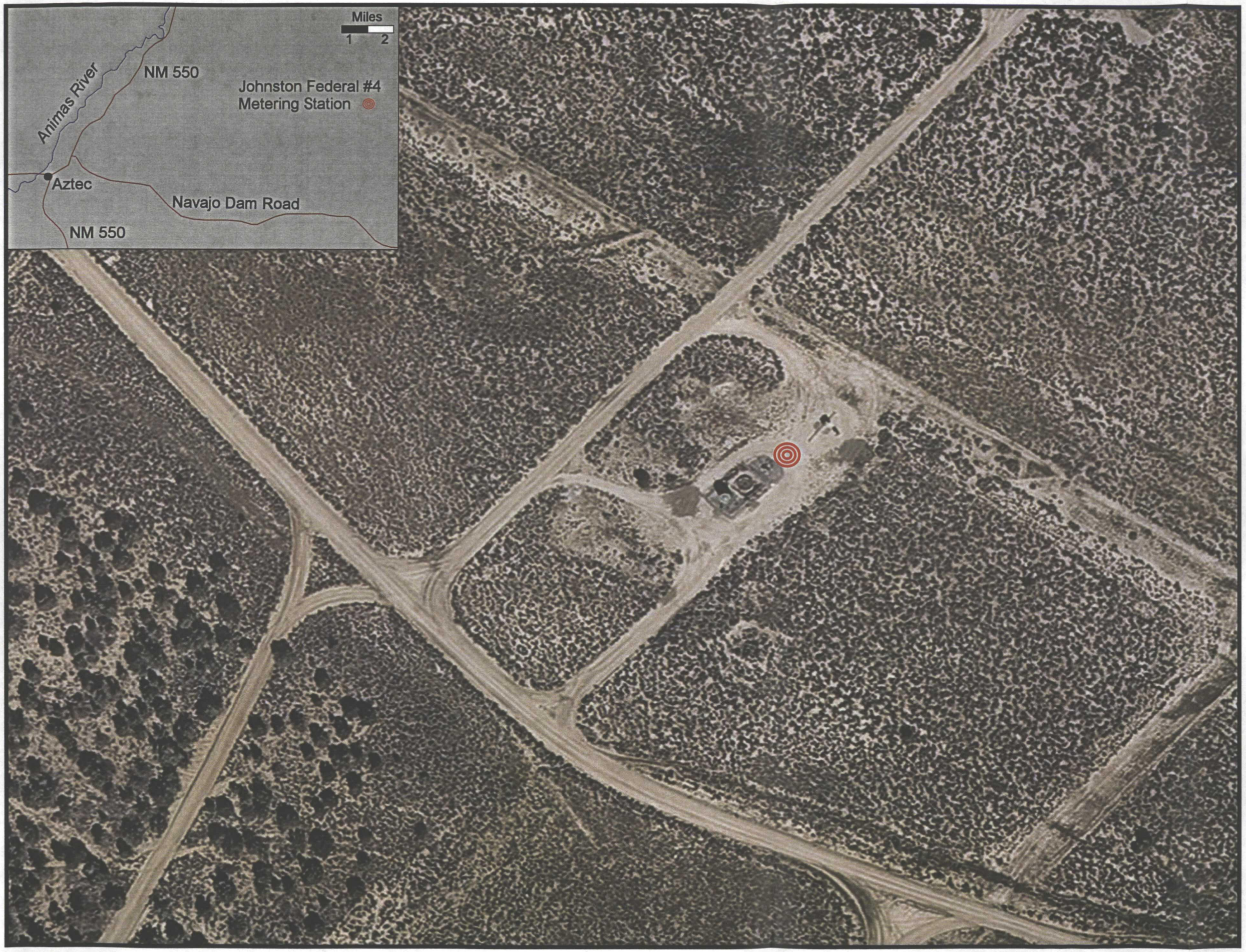
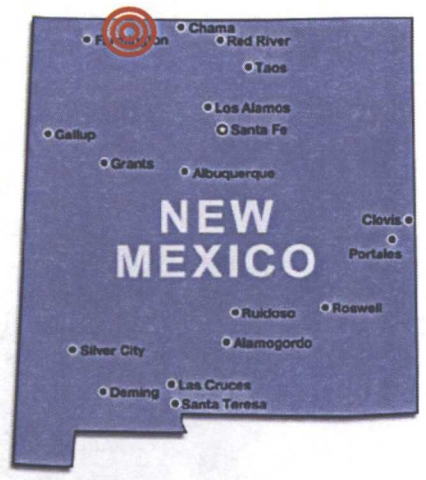


FIGURE 1.

Site Location Map
ConocoPhillips Company
Johnston Federal No. 4
Metering Station
Aztec, NM



Approximate ConocoPhillips Company Johnston Federal No. 4 Metering Station site location

Latitude = 36.862661 deg N
Longitude = -107.772342 deg W

N

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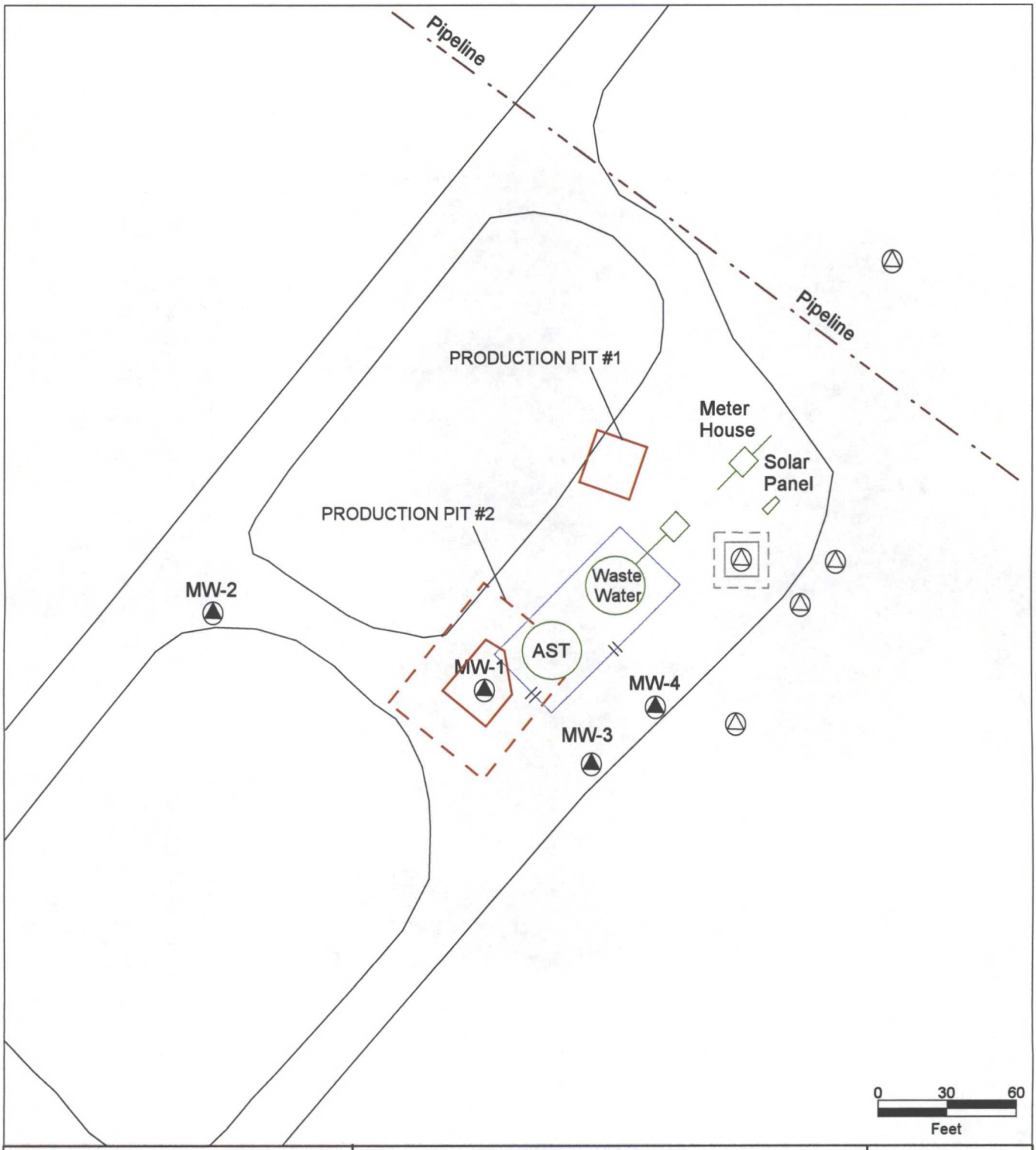

FIGURE 2:
SITE LAYOUT MAP
CONOCOPHILLIPS COMPANY
JOHNSTON FEDERAL No. 4
METERING STATION
Sec 27, T31N, R09W
Aztec, New Mexico

LEGEND

- MONITORING WELL
- EL PASO MONITORING WELL
- FORMER PRODUCTION PIT
- APPROXIMATE EXCAVATION LOCATION
- FORMER EI PASO DEHYDRATOR PIT
- APPROXIMATE EL PASO EXCAVATION LOCATION
- EQUIPMENT
- BERM

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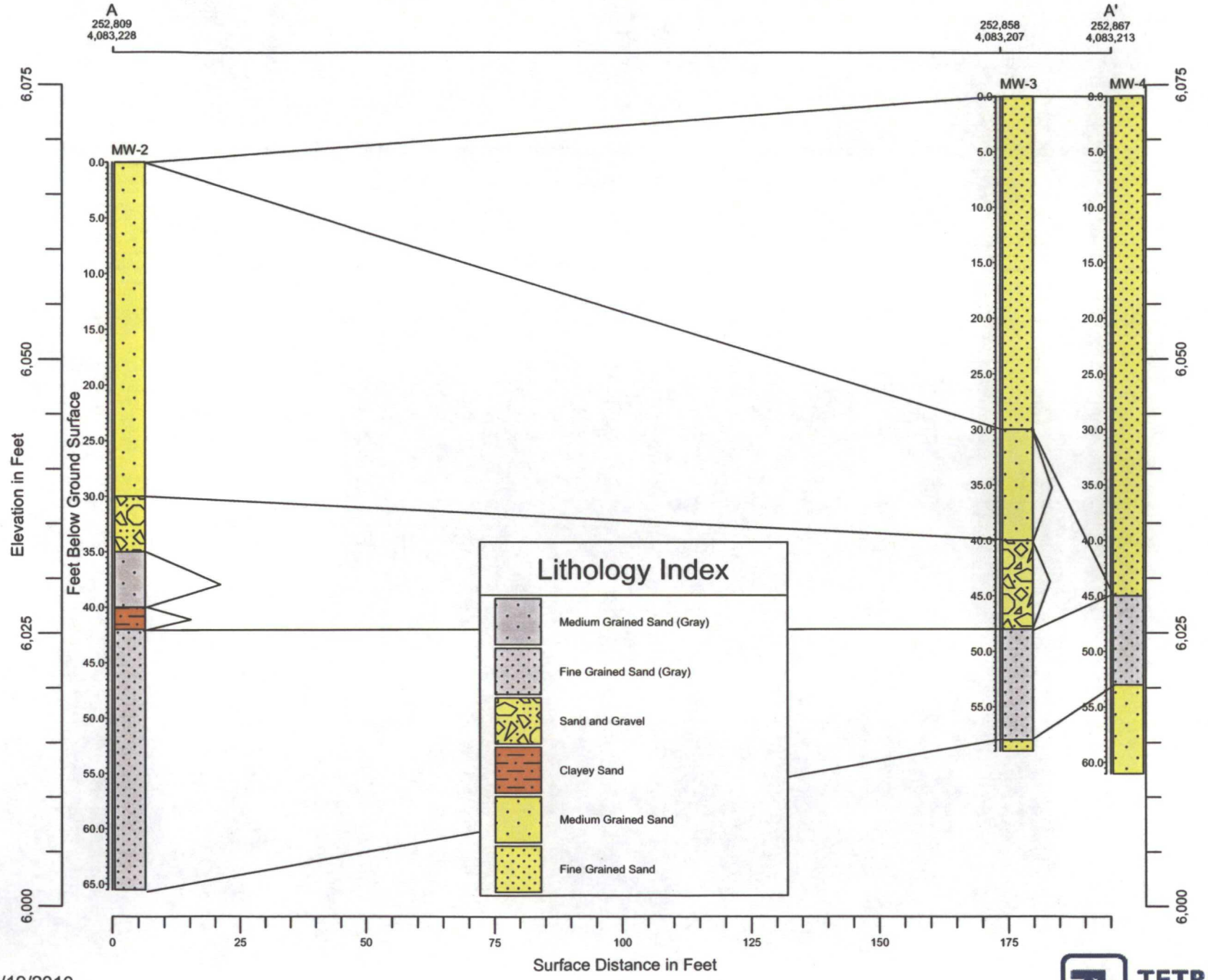
TETRA TECH, INC.

Figure 3.
Johnston Federal No. 4 - Cross-Section A-A'



5/19/2010

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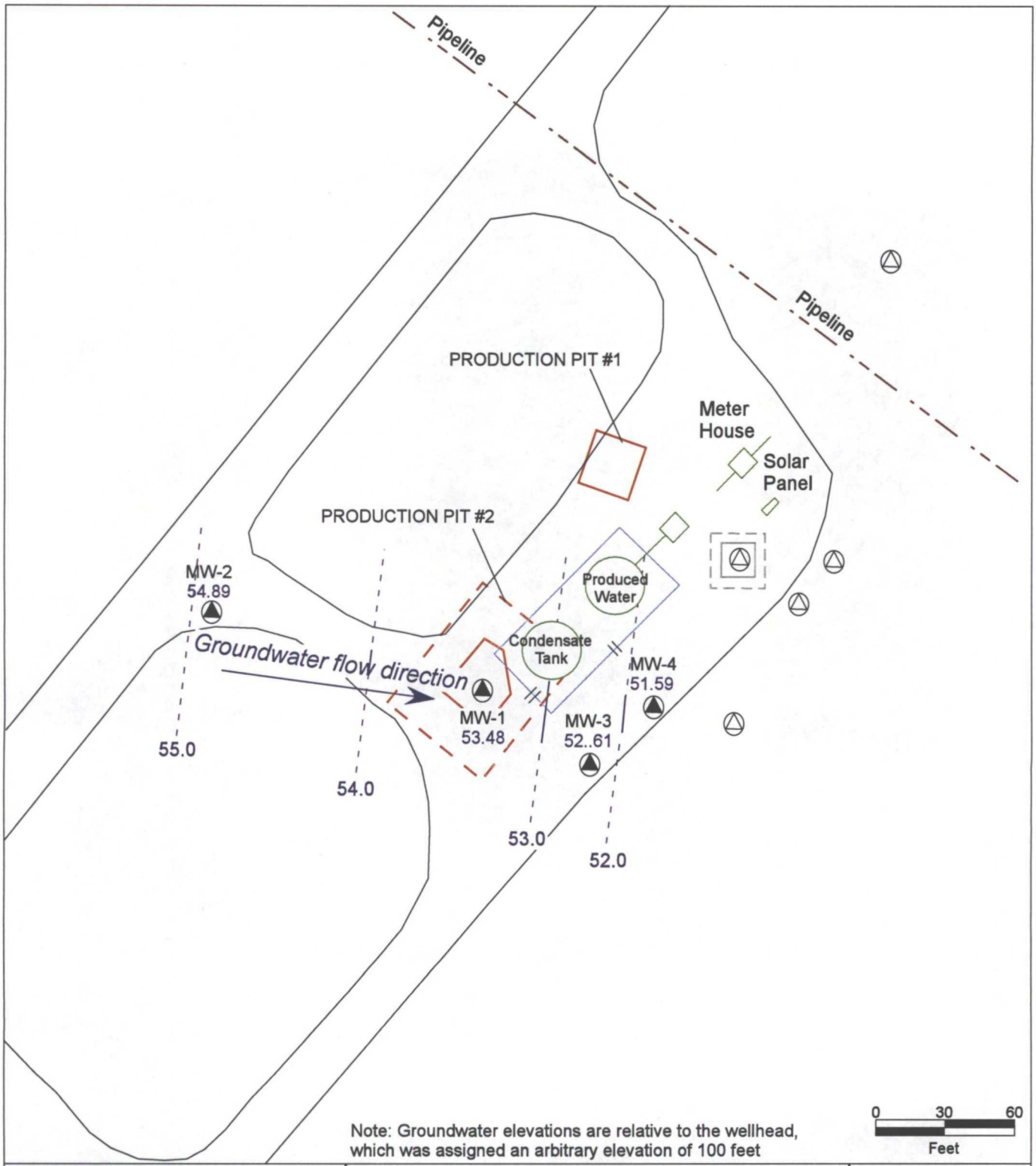

FIGURE 4:
GROUNDWATER ELEVATION CONTOUR MAP
SEPTEMBER 2009
CONOCOPHILLIPS COMPANY
JOHNSTON FEDERAL No. 4
METERING STATION
T31N, R09W, Section 27
Aztec, New Mexico

LEGEND

- MONITORING WELL
- EL PASO MONITORING WELL
- FORMER PRODUCTION PIT
- APPROXIMATE EXCAVATION LOCATION
- FORMER El PASO DEHYDRATOR PIT
- APPROXIMATE EL PASO EXCAVATION LOCATION
- GROUNDWATER ELEVATION (dashed where inferred)
- EQUIPMENT
- BERM

N

TETRA TECH, INC.

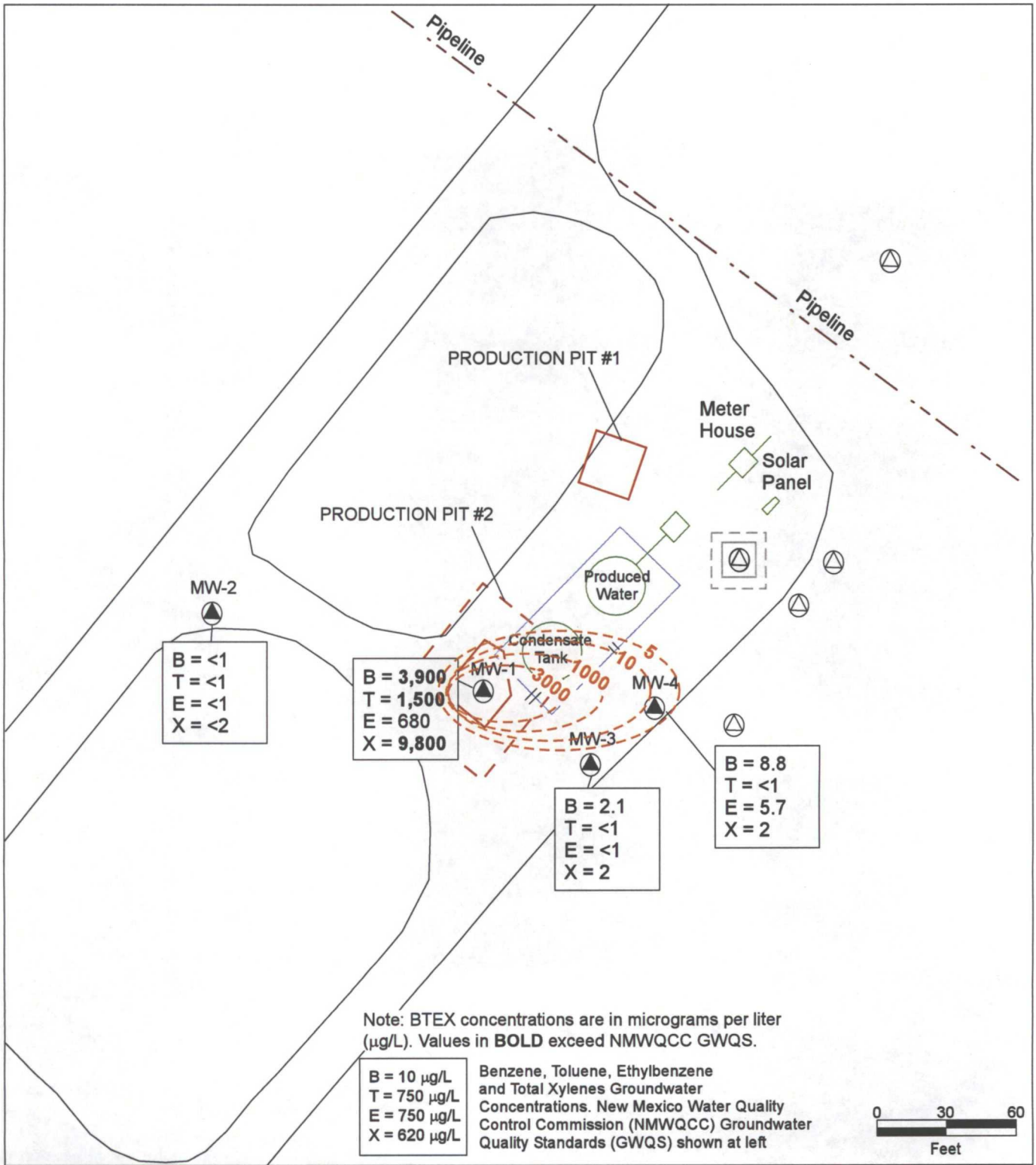

FIGURE 5:
BTEX CONCENTRATION MAP SEPTEMBER 2009
CONOCOPHILLIPS COMPANY
JOHNSTON FEDERAL No. 4
METERING STATION
Sec 27, T31N, R09W
Aztec, New Mexico

TABLES

Johnston Federal No. 4 Metering Station
Table 1 - Site History Timeline

Date/Time Period	Event/Action	Description/Comments
August 1952	Well Spudded	Well was spudded by Anderson-Prichard Oil Corp. on August 21, 1952.
April 1961	Transfer of Well Ownership	Ownership of the well transferred from Anderson-Prichard Oil Corp. to Union Texas Natural Gas Corporation on April 26, 1961.
September 1971	Transfer of Well Ownership	Meridian Oil Inc. (a wholly-owned subsidiary of Burlington Resources) took over operation of well from Union Texas Petroleum Corp. on September 17, 1991.
August 1994	Initial Site Assesment	El Paso Energy conducted a site assessment of a former unlined pit near the metering station in August of 1994.
September 1994	Pit Excavation	El Paso Energy excavated ~60 cy of soil from their former unlined pit in September 1994.
August 1995	Monitoring Well Installation	El Paso contracted Philip Environmental Services Corp. to install a monitor well in the vicinity of their former pit on August 9, 1995.
December 1995	Monitoring Well Installation	El Paso contracted Philip Env. Svcs. to install two downgradient MW's between December 12 and 15, 1995.
August 1997	Product Removal	El Paso Energy commenced product removal from their MW-1 on August 26, 1997.
September 1997	Piezometer Installation	El Paso contracted Philip Services to install 3 temporary piezometers on September 15, 1997.
July 1998	NMOCD Communication With Site Operators	New Mexico Oil Conservation Division (NMOCD) issued response letter to El Paso Field Services (EPFS) on July 8, 1998, indicating that they would be sending letters to the operators of the sites (including Burlington Resources) and that EPFS should work cooperatively with the operators on investigation and remediation activities.
July 1998	NMOCD Requests Groundwater Investigation by Burlington Resources	NMOCD issued letter to Burlington Resources on July 9, 1998, references work done at the site by EPFS and requires Burlington Resources to immediately implement their previously approved pit closure plan. The letter also requires BR to submit a comprehensive GW investigation and remediation plan for all pit closure sites in the SJB that encounter GW.
August 1998	Burlington Resources Granted Closure of Pit #1	Burlington Resources sampled Pit #1 on August 10, 1998 and laboratory analytical results indicated a clean closure was warranted.
August 1998	Initial Site Assessment	Initial site assessment conducted on the site separator pit. Soil from this area was collected and analyzed for total petroleum hydrocarbons (TPH) and was found to contain TPH below NMOCD recommended action levels. The pit was subsequently granted closed status by NMOCD.
August 1998	Initial Site Assessment	Initial site assessment conducted on the tank drain pit. Soil from this area was collected and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and for TPH. Concentrations of these constituents were found to be above NMOCD recommended action levels.
December 1998	Pit Excavation	Burlington Resources excavated ~3,055 CY of hydrocarbon-impacted soil from Pit #2 (58 ft x 45 ft x 30 ft deep), starting on December 17, 1998. The excavation extended to ~30 ft bgs (practical extent). The bottom of the excavation was sampled on December 28, 1998.
May 1999	Monitoring Well Installation	Monitor Well MW-1 installed to a depth of 50 feet below ground surface (bgs); the screened interval was placed from 35 to 50 feet bgs, and was installed in the center of pit #2. Burlington Resources begins monitoring MW-1 on a quarterly basis.

Johnston Federal No. 4 Metering Station
Table 1 - Site History Timeline

Date/Time Period	Event/Action	Description/Comments
June 1999	Confirmation of Groundwater Impacts	Laboratory analysis of groundwater from MW-1 shows levels of benzene, toluene, and total xylenes in excess of New Mexico Water Quality Control Commission (NMWQCC) groundwater quality standards. Burlington Resources notified NMOCD via E-mail on June 1, 1999.
July 2001	NMOCD Communication With Site Operators	07/18/2001 NMOCD response letter sent to EPFS on July 18, 2001 again urges EPFS to work cooperatively with the operators to investigate and remediate contaminated groundwater.
April 2003	NMOCD Requests Monitoring Well Installation	NMOCD response letter to EPFS sent on April 3, 2003, requires EPFS to install additional monitoring wells to determine the real extent of groundwater contamination.
March 2006	Acquisition of Burlington Resources by ConocoPhilips Company	ConocoPhillips Company acquired Burlington Resources on March 31, 2006.
November 2007 and January 2008	3rd and 4th Quarter 2007 Groundwater Monitoring	Johnston Federal No. 4 Monitoring Station groundwater sampled during Nov. 2007 and Jan. 2008 by Tetra Tech.
March 2008	Reporting	2007 Annual Groundwater Monitoring Report submitted to NMOCD.
March 2008	Groundwater Monitoring	Tetra Tech conducts quarterly groundwater monitoring at the site for BTEX.
April 2008	NMOCD Requests Further Investigation	NMOCD indicates additional investigation and sampling is necessary for closure consideration during a meeting with Glenn Von Gonten
April 2008	1st quarter 2008 Groundwater Monitoring	Tetra Tech conducts quarterly groundwater monitoring at the site for BTEX in MW-1 on April 30, 2008. Note: Prior to this date, however, the location of MW-1 was not clear and the wrong well was subsequently sampled. This was the first quarter that ConocoPhillips MW-1 was sampled. BTEX constituents were found to be above NMWQCC standards in MW-1.
July 2008	2nd Quarter 2008 Groundwater Monitoring	Tetra Tech conducts quarterly groundwater monitoring at the site for BTEX in MW-1.
August 2008	Groundwater Monitoring Well Installation	Monitoring Wells MW-2, MW-3, and MW-4 installed at the site by WDC.
October 2008	3rd Quarter 2008 groundwater Monitoring	Tetra Tech conducts quarterly monitoring at the site for MW-1 through MW-4. MW-2, MW-3 and MW-4 groundwater samples are analyzed for baseline parameters including major ions, total metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs) including BTEX, diesel range organics, and gasoline range organics as requested by the NMOCD. In addition, an expanded list (beyond BTEX analysis) of VOCs were included for MW-1.
January 2009	4th Quarter 2008 groundwater Monitoring	Tetra Tech conducts quarterly monitoring at the site for MW-1 through MW-4. The groundwater sample obtained for MW-1 is analyzed for baseline parameters including major ions, total metals, SVOCs, VOCs, diesel range organics, and gasoline range organics. As of January 2009, baseline parameters have been collected for all 4 groundwater monitoring wells at the site.
September 25, 2009	2009 annual groundwater monitoring	Tetra Tech conducts annual groundwater monitoring at the site for MW-1 through MW-4 including analyses for BTEX, naphthalene, dissolved Fe and Mn and sulfate.

Table 2. Monitoring Well Specifications and Groundwater Elevation Table

Well ID	Total Depth (ft bgs)	Screen Interval (ft)	*Elevation (ft) (TOC)	Date Measured	Depth to Groundwater (ft below TOC)	Relative Groundwater Elevation
MW-1	51.79	35.0 - 50.0	100	5/25/1999	NM	NM
				9/1/1999	47.02	52.98
				12/1/1999	46.96	53.04
				1/18/2000	44.05	55.95
				5/17/2000	46.90	53.10
				9/8/2000	46.91	53.09
				12/20/2000	46.88	53.12
				3/27/2001	NM	NM
				6/27/2001	47.05	52.95
				9/17/2001	46.93	53.07
				12/19/2001	46.97	53.03
				3/25/2002	46.99	53.01
				6/25/2002	47.01	52.99
				9/24/2002	46.98	53.02
				12/30/2002	47.40	52.60
				3/27/2003	NM	NM
				6/27/2003	NM	NM
				10/10/2003	NM	NM
				12/10/2003	NM	NM
				3/16/2004	47.28	52.72
				6/22/2004	47.06	52.94
				9/30/2004	47.24	52.76
				12/13/2004	47.14	52.86
				3/23/2005	46.91	53.09
				6/22/2005	46.93	53.07
				10/28/2005	46.87	53.13
				12/14/2005	46.72	53.28
				3/20/2006	46.75	53.25
				6/21/2006	46.84	53.16
				10/20/2006	46.89	53.11
				12/13/2006	46.92	53.08
				11/9/2007	NM	NM
				1/15/2008	NM	NM
				4/30/2008	46.45	53.55
				7/23/2008	46.63	53.37
				10/24/2008	46.60	53.40
				1/29/2009	46.57	53.43
				4/23/2009	46.40	53.60
				9/25/2009	46.52	53.48
MW-2	65.50	41.5 - 61.5	97.71	10/24/2008	42.85	54.86
				1/29/2009	42.83	54.88
				4/23/2009	42.75	54.96
				9/25/2009	42.82	54.89

Table 2. Monitoring Well Specifications and Groundwater Elevation Table

Well ID	Total Depth (ft bgs)	Screen Interval (ft)	*Elevation (ft) (TOC)	Date Measured	Depth to Groundwater (ft below TOC)	Relative Groundwater Elevation
MW-3	59.00	35.0 - 55.0	94.65	10/24/2008	43.91	50.74
				1/29/2009	41.97	52.68
				4/23/2009	41.87	52.78
				9/25/2009	42.04	52.61
MW-4	61.00	37.0 - 57.0	94.79	10/24/2008	43.11	51.68
				1/29/2009	43.11	51.68
				4/23/2009	43.06	51.73
				9/25/2009	43.20	51.59

ft = Feet

TOC = Top of casing

bgs = below ground surface

* Elevation relative to the TOC of MW-1, set at arbitrary 100 feet.

NM - Not measured

Table 3. Groundwater Laboratory Analytical Results Summary

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Napthalene (µg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)
MW-1	5/25/1999	**8,700**	**2,900**	**2,800**	**2,900**	NO DATA			
	9/1/1999	Free Phase Product Detected - No Sample Collected							
	12/1/1999	**4,700**	**1,300**	**900**	**10,000**				
	1/18/2000	**3,600**	**820**	**840**	**7,500**				
	5/17/2000	**6,900**	**1,100**	**1,500**	**17,000**				
	9/8/2000	**4,600**	620	**930**	**10,000**				
	12/20/2000	< 0.2	1	34	61				
	3/27/2001	**5,430**	641	**991**	**9,830**				
	6/27/2001	**5,870**	**900**	**990**	**10,400**				
	9/17/2001	**5,910**	**750**	**980**	**10,700**				
	12/19/2001	**7,200**	650	**1,020**	**11,300**				
	3/25/2002	**5,520**	**830**	**1,190**	**10,500**				
	6/26/2002	**516**	66	79	**863**				
	9/24/2002	**5,310**	**8,000**	**880**	**13,960**				
	12/30/2002	**7,660**	**10,200**	**760**	**14,140**				
	3/27/2003	Free Phase Product Detected - No Sample Collected							
	6/27/2003	Free Phase Product Detected - No Sample Collected							
	10/10/2003	Free Phase Product Detected - No Sample Collected							
	12/10/2003	Free Phase Product Detected - No Sample Collected							
	3/16/2004	Free Phase Product Detected - No Sample Collected							
	6/22/2004	**6,160**	**8,100**	470	**15,840**				
	9/30/2004	Free Phase Product Detected - No Sample Collected							
	12/13/2004	Free Phase Product Detected - No Sample Collected							
	3/23/2005	Free Phase Product Detected - No Sample Collected							
	6/22/2005	Free Phase Product Detected - No Sample Collected							
	10/28/2005	Free Phase Product Detected - No Sample Collected							
	12/14/2005	Free Phase Product Detected - No Sample Collected							
	3/20/2006	**3,170**	**3,740**	**1,060**	**30,130**				
	6/21/2006	**4,900**	**3,280**	448	**2,390**				
	10/20/2006	Free Phase Product Detected - No Sample Collected							
	12/13/2006	**5,300**	**7,200**	**870**	**15,450**				
	3/27/2007	**6,870**	**5,720**	210	**12,160**				
	6/25/2007	**5,680**	**1,830**	400	**9,480**				
	11/9/2007	NA	NA	NA	NA				
	1/15/2008	NA	NA	NA	NA				
	4/30/2008	**6,300**	**1,800**	280 J	**8,600**				
	7/23/2008	**7,100**	**2,200**	450	**10,600**				
	10/24/2008	**6,000**	**2,100**	400	**9,000**	**44**	NA	NA	NA
	1/29/2009	**6,700**	**2,200**	630	**14,500**	**61**	1.1*	0.347*	315
	9/25/2009	**3,900**	**1,500**	680	**9,800**	**40**	**1.11**	<0.02	429

Table 3. Groundwater Laboratory Analytical Results Summary

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	Napthalene (µg/L)	Dissolved Manganese (mg/L)	Dissolved Iron (mg/L)	Sulfate (mg/L)
MW-2	10/24/2008	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	<5	0.337*	2.08*	**974**
	1/29/2009	< 0.5	< 0.5	< 0.5	< 0.5	NA	NA	NA	NA
	9/25/2009	<1	<1	<1	<2	<1	0.04	<0.02	**1,260**
MW-3	10/24/2008	**20**	< 0.5 U	< 0.5 U	24	<5	1.43*	0.542*	**714**
	1/29/2009	**12**	< 0.5	< 0.5	5	NA	NA	NA	NA
	9/25/2009	2.1	<1	<1	<2	<1	**1.24**	<0.02	**1,070**
MW-4	10/24/2008	**24**	< 0.5 U	6	10	<5	0.977*	1.16*	**678**
	1/29/2009	**110**	6	9	147	<5	NA	NA	NA
	9/25/2009	8.8	<1	5.7	2	<1	**1.24**	0.508	**968**
NMWQCC Groundwater Quality Standards		**10**	**750**	**750**	**620**	**30**	**0.2**	**1**	**600**

Explanation

NMWQCC = New Mexico Water Quality Control Commission
mg/L = milligrams per liter (parts per million)
µg/L = micrograms per liter (parts per billion)
<0.7 = Below laboratory detection limit of 0.7 ug/L
J = Estimated value between MDL and PQL
U = Analyte was analyzed for but not detected at the indicated MDL
Bold = concentrations that exceed the NMWQCC groundwater quality standard
NA - not analyzed. Incorrect well sampled during these dates for MW-1
* Results are shown for total metals analysis and can not be compared to the NMWQCC standard for dissolved metals

APPENDIX A

Groundwater Sampling Field Forms

TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Johnston Federal #4 Page 1 of 4

Project No.

Site Location San Juan County, Hwy 173 near Aztec, NM

Site/Well No. MW-1 Coded/ Replicate No. Duplicate Date 9/25/09

Weather Sunny, Warm, no wind Time Sampling Began 1028 Time Sampling Completed 1115

EVACUATION DATA DUP @ 1130

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface MP Elevation 100

Total Sounded Depth of Well Below MP 51.79 51.71 Water-Level Elevation 53.48

Held ____ Depth to Water Below MP 46.52 Diameter of Casing 2"

Wet ____ Water Column in Well 5.19' Gallons Pumped/Bailed Prior to Sampling 2.5

Gallons per Foot 0.16

Gallons in Well 0.83 Sampling Pump Intake Setting ____ (feet below land surface) ____

Purging Equipment Purge pump (Bailer) x3 = 2.49

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm)	TDS (g/L)	DO (mg/L)	ORP (mV)	TURB
1045	15.02	6.91	2142	1.392	7.38	-288.6	32.05
1056	15.02	6.85	2114	1.374	3.32	-302.9	41.09
1103	15.09	6.85	2118	1.377	6.08	-301.4	36.91

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX + Naphthalene	3 40mL VOA's	HCl
Sulfate	1/6 oz plastic	None
Dissolved Fe, Mn	1/6 oz plastic	none (to be filtered & preserved @ lab)

Remarks Strong HC odor, spotty sheen, gray color

Sampling Personnel GD, AM

Well Casing Volumes

Gal./ft.							
	1 ¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 ½" = 0.10	2 ½" = 0.24	3" ½ = 0.50	6" = 1.46

TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Johnston Federal #4 — Page 2 of 4

Project No.

Site Location San Juan County, Hwy 173 near Aztec, NM

Site/Well No. MW-2 — Coded/ Replicate No. — Date 9/25/09

Weather clear, 105° — Time Sampling Began 0945 — Time Sampling Completed 1030

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface — MP Elevation 97.71

Total Sounded Depth of Well Below MP ~~65.5~~ 64.40 — Water-Level Elevation 54.89

Heid ____ Depth to Water Below MP 42.82 — Diameter of Casing (2") 2"

Wet ____ Water Column in Well 21.58 — Gallons Pumped/Bailed Prior to Sampling 10.5 gallons

Gallons per Foot 0.16

Gallons in Well 3.45 x 3 = 10.35 — Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

VA / pH	Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)	turb.
pH	1006	13.90	6.97	2241	1.456	6.34	3.7	253.9
5.75	1012	13.90	6.86	2250	1.462	4.82	20.7	373.5
7	1023	14.11	6.86	2252	1.464	4.16	32.6	272.2
9.5	1027	13.81	6.88	2250	1.462	4.39	39.6	302.8

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX + Naphthalene	3 40mL VOA's	HCl
Sulfate	1 liter plastic	none
Dissolved Fe, Mn	16 oz plastic	none (to be filtered & preserved @ Lab)

Remarks

Sampling Personnel GD, AM

Well Casing Volumes

Gal./ft.	1 ¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 ½" = 0.10	2 ½" = 0.24	3" ½ = 0.50	6" = 1.46

TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Johnston Federal #4 — Page 3 of 4

Project No.

Site Location San Juan County, Hwy 173 near Aztec, NM

Site/Well No. MW-3 — Coded/ Replicate No. — Date 9/25/09

Weather Sunny, Cool, no breeze — Time Sampling Began 0930 — Time Sampling Completed 1005

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface — MP Elevation 94.165

Total Sounded Depth of Well Below MP ~~58~~ 57.58 — Water-Level Elevation 52.61

Hold ____ Depth to Water Below MP 42.04 — Diameter of Casing (2") — 2"

Wet ____ Water Column in Well 15.54' — Gallons Pumped/Bailed Prior to Sampling 7.46

Gallons per Foot 0.16

Gallons in Well 2.49 — Sampling Pump Intake Setting (feet below land surface) —

Purging Equipment Purge pump / (Bailer) X 3 = 7.46

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)	TURB
0940	15.21	6.91	2056	1.336	3.37	-41.9	65.17
0951	15.18	6.83	2059	1.339	2.82	-44.3	71.57
1000	15.12	6.95	2074	1.348	2.75	-34.7	71.23

Sampling Equipment Purge Pump / (Bailer)

Constituents Sampled	Container Description	Preservative
BTEX + Naphthalene	3 40mL VOA's	HCl
Sulfate	16 oz plastic	none
Dissolved Fe, Mn	16 oz plastic	none (to be filtered & preserved @ lab)

Remarks Water is slightly cloudy w/ mild to strong HC odor

Sampling Personnel GD

Well Casing Volumes

Gal./ft.							
	1 ¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 ½" = 0.10	2 ½" = 0.24	3" ½ = 0.50	6" = 1.46

TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Johnston Federal #4 — Page 4 of 4

Project No.

Site Location San Juan County, Hwy 173 near Aztec, NM

Site/Well No. MW-4 — Coded/ Replicate No. — Date 9/25/09

Weather Clear, 40° — Time Sampling Began 900 — Time Sampling Completed 0930

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface — MP Elevation 94.79

Total Sounded Depth of Well Below MP 61.4 — Water-Level Elevation 57.59

Held — Depth to Water Below MP 43.20 — Diameter of Casing 2"

Wet — Water Column in Well 18.2 — Gallons Pumped/Bailed Prior to Sampling 9 gallons

Gallons per Foot 0.16

Gallons in Well 2.91 x 3 = 8.73 — Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

Vol	Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)	Turb.
3	907	15.39	6.69	1986	1.291	13.16	-11.3	42.01
5.5	920	15.29	6.78	1993	1.295	3.40	-16.2	34.40
8.5	926	15.26	6.79	1998	1.292	3.31	-15.8	19.45

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX + Naphthalene	3 40mL VOA's	HCl
Sulfate	16 oz plastic	none
Dissolved Fe, Mn	16 oz plastic	none (to be filtered & preserved @ Lab)

Remarks Slight HC odor, light gray in color

Sampling Personnel GD, AM

Well Casing Volumes

Gal./ft.	1 ¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1 ½" = 0.10	2 ½" = 0.24	3" ½ = 0.50	6" = 1.46

APPENDIX B

Groundwater Laboratory Analysis Report

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

Conoco Phillips

Certificate of Analysis Number:

09091282

Report To:		Project Name:	COP Johnston Fed4
Tetra Tech, Inc.		Site:	Aztec, NM
Kelly Blanchard		Site Address:	
6121 Indian School Road, N.E.			
Suite 200		PO Number:	
Albuquerque		State:	New Mexico
NM		State Cert. No.:	
87110-		Date Reported:	10/6/2009
ph: (505) 237-8440	fax:		

This Report Contains A Total Of 18 Pages

Excluding This Page, Chain Of Custody

And

Any Attachments

10/7/2009

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:

Conoco Phillips

Certificate of Analysis Number:

09091282

Report To:		Project Name:	COP Johnston Fed4
Tetra Tech, Inc.		Site:	Aztec, NM
Kelly Blanchard		Site Address:	
6121 Indian School Road, N.E.			
Suite 200		PO Number:	
Albuquerque		State:	New Mexico
NM		State Cert. No.:	
87110-		Date Reported:	10/6/2009
ph: (505) 237-8440	fax:		

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.

II: ANALYSES AND EXCEPTIONS:

Per the Conoco Phillips TSM Revision 0, a copy of the internal chain of custody is to be included in final data package. However, due to LIMS limitations, this cannot be provided at this time.

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.

10/7/2009

Erica Cardenas
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

Conoco Phillips

Certificate of Analysis Number:

09091282

Report To: Tetra Tech, Inc.
Kelly Blanchard
6121 Indian School Road, N.E.
Suite 200
Albuquerque
NM
87110-
ph: (505) 237-8440 fax: (505) 881-3283

Fax To:

Project Name: COP Johnston Fed4
Site: Aztec, NM
Site Address:
PO Number:
State: New Mexico
State Cert. No.:
Date Reported: 10/6/2009

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-1	09091282-01	Water	9/25/2009 11:15:00 AM	9/26/2009 9:30:00 AM	331739	☐
MW-2	09091282-02	Water	9/25/2009 10:30:00 AM	9/26/2009 9:30:00 AM	331739	☐
MW-3	09091282-03	Water	9/25/2009 10:05:00 AM	9/26/2009 9:30:00 AM	331739	☐
MW-4	09091282-04	Water	9/25/2009 9:30:00 AM	9/26/2009 9:30:00 AM	331739	☐
Duplicate	09091282-05	Water	9/25/2009 11:30:00 AM	9/26/2009 9:30:00 AM	331739	☐
Trip Blank	09091282-06	Water	9/25/2009 2:30:00 PM	9/26/2009 9:30:00 AM	331739	☐

Erica Cardenas
Project Manager

10/7/2009
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-1 **Collected:** 09/25/2009 11:15 **SPL Sample ID:** 09091282-01

Site: Aztec, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY					**MCL**	**E300.0**	**Units: mg/L**	
Sulfate	429		25		50	09/28/09 13:00	BDG	5222026
METALS BY METHOD 6010B, DISSOLVED					**MCL**	**SW6010B**	**Units: mg/L**	
Iron	ND		0.02		1	10/06/09 10:27	AB1	5233403
Manganese	1.11		0.005		1	10/06/09 10:27	AB1	5233403

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	09/28/2009 10:00	R_V	1.00

VOLATILE ORGANICS BY METHOD 8260B					**MCL**	**SW8260B**	**Units: ug/L**	
Benzene	3900		50		50	10/02/09 16:16	E_G	5230040
Ethylbenzene	680		50		50	10/02/09 16:16	E_G	5230040
Naphthalene	40		1		1	09/29/09 10:30	E_G	5222635
Toluene	1500		50		50	10/02/09 16:16	E_G	5230040
m,p-Xylene	8100		100		50	10/02/09 16:16	E_G	5230040
o-Xylene	1700		50		50	10/02/09 16:16	E_G	5230040
Xylenes,Total	9800		50		50	10/02/09 16:16	E_G	5230040
Surr: 1,2-Dichloroethane-d4	96.6		%	78-116	50	10/02/09 16:16	E_G	5230040
Surr: 1,2-Dichloroethane-d4	103		%	78-116	1	09/29/09 10:30	E_G	5222635
Surr: 4-Bromofluorobenzene	111		%	74-125	50	10/02/09 16:16	E_G	5230040
Surr: 4-Bromofluorobenzene	92.3		%	74-125	1	09/29/09 10:30	E_G	5222635
Surr: Toluene-d8	101		%	82-118	50	10/02/09 16:16	E_G	5230040
Surr: Toluene-d8	113		%	82-118	1	09/29/09 10:30	E_G	5222635

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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-2 **Collected:** 09/25/2009 10:30 **SPL Sample ID:** 09091282-02

Site: Aztec, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY				**MCL**	**E300.0**	**Units: mg/L**	
Sulfate	1260		100	200	09/28/09 13:16	BDG	5222027
METALS BY METHOD 6010B, DISSOLVED				**MCL**	**SW6010B**	**Units: mg/L**	
Iron	ND		0.02	1	10/06/09 10:31	AB1	5233404
Manganese	0.04		0.005	1	10/06/09 10:31	AB1	5233404

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	09/28/2009 10:00	R_V	1.00

VOLATILE ORGANICS BY METHOD 8260B				**MCL**	**SW8260B**	**Units: ug/L**	
Benzene	ND		1	1	09/29/09 3:00	E_G	5222630
Ethylbenzene	ND		1	1	09/29/09 3:00	E_G	5222630
Naphthalene	ND		1	1	09/29/09 3:00	E_G	5222630
Toluene	ND		1	1	09/29/09 3:00	E_G	5222630
m,p-Xylene	ND		2	1	09/29/09 3:00	E_G	5222630
o-Xylene	ND		1	1	09/29/09 3:00	E_G	5222630
Xylenes,Total	ND		1	1	09/29/09 3:00	E_G	5222630
Surr: 1,2-Dichloroethane-d4	98.0	%	78-116	1	09/29/09 3:00	E_G	5222630
Surr: 4-Bromofluorobenzene	110	%	74-125	1	09/29/09 3:00	E_G	5222630
Surr: Toluene-d8	101	%	82-118	1	09/29/09 3:00	E_G	5222630

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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-3 **Collected:** 09/25/2009 10:05 **SPL Sample ID:** 09091282-03

Site: Aztec, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY				**MCL**	**E300.0**	**Units: mg/L**		
Sulfate	1070		100		200	09/28/09 13:33	BDG	5222028
METALS BY METHOD 6010B, DISSOLVED				**MCL**	**SW6010B**	**Units: mg/L**		
Iron	ND		0.02		1	10/06/09 10:35	AB1	5233405
Manganese	1.24		0.005		1	10/06/09 10:35	AB1	5233405

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	09/28/2009 10:00	R_V	1.00

VOLATILE ORGANICS BY METHOD 8260B				**MCL**	**SW8260B**	**Units: ug/L**		
Benzene	2.1		1		1	09/29/09 4:11	E_G	5222633
Ethylbenzene	ND		1		1	09/29/09 4:11	E_G	5222633
Naphthalene	ND		1		1	09/29/09 4:11	E_G	5222633
Toluene	ND		1		1	09/29/09 4:11	E_G	5222633
m,p-Xylene	ND		2		1	09/29/09 4:11	E_G	5222633
o-Xylene	ND		1		1	09/29/09 4:11	E_G	5222633
Xylenes,Total	ND		1		1	09/29/09 4:11	E_G	5222633
Surr: 1,2-Dichloroethane-d4	96.4		% 78-116		1	09/29/09 4:11	E_G	5222633
Surr: 4-Bromofluorobenzene	110		% 74-125		1	09/29/09 4:11	E_G	5222633
Surr: Toluene-d8	101		% 82-118		1	09/29/09 4:11	E_G	5222633

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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-4 **Collected:** 09/25/2009 9:30 **SPL Sample ID:** 09091282-04

Site: Aztec, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY				**MCL**	**E300.0**	**Units: mg/L**		
Sulfate	968		100		200	09/28/09 13:50	BDG	5222029
METALS BY METHOD 6010B, DISSOLVED				**MCL**	**SW6010B**	**Units: mg/L**		
Iron	0.508		0.02		1	10/06/09 10:40	AB1	5233406
Manganese	1.24		0.005		1	10/06/09 10:40	AB1	5233406

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	09/28/2009 10:00	R_V	1.00

VOLATILE ORGANICS BY METHOD 8260B				**MCL**	**SW8260B**	**Units: ug/L**		
Benzene	8.8		1		1	09/29/09 4:35	E_G	5222634
Ethylbenzene	5.7		1		1	09/29/09 4:35	E_G	5222634
Naphthalene	ND		1		1	09/29/09 4:35	E_G	5222634
Toluene	ND		1		1	09/29/09 4:35	E_G	5222634
m,p-Xylene	2		2		1	09/29/09 4:35	E_G	5222634
o-Xylene	ND		1		1	09/29/09 4:35	E_G	5222634
Xylenes,Total	2		1		1	09/29/09 4:35	E_G	5222634
Surr: 1,2-Dichloroethane-d4	98.7	%	78-116		1	09/29/09 4:35	E_G	5222634
Surr: 4-Bromofluorobenzene	110	%	74-125		1	09/29/09 4:35	E_G	5222634
Surr: Toluene-d8	100	%	82-118		1	09/29/09 4:35	E_G	5222634

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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: Duplicate **Collected:** 09/25/2009 11:30 **SPL Sample ID:** 09091282-05

Site: Aztec, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
VOLATILE ORGANICS BY METHOD 8260B			**MCL**	**SW8260B**	**Units: ug/L**		
Benzene	4100		50	50	10/02/09 16:40	E_G	5230041
Ethylbenzene	660		50	50	10/02/09 16:40	E_G	5230041
Naphthalene	41		1	1	09/29/09 10:53	E_G	5222636
Toluene	1700		50	50	10/02/09 16:40	E_G	5230041
m,p-Xylene	8100		100	50	10/02/09 16:40	E_G	5230041
o-Xylene	1700		50	50	10/02/09 16:40	E_G	5230041
Xylenes,Total	9800		50	50	10/02/09 16:40	E_G	5230041
Surr: 1,2-Dichloroethane-d4	94.9		% 78-116	50	10/02/09 16:40	E_G	5230041
Surr: 1,2-Dichloroethane-d4	105		% 78-116	1	09/29/09 10:53	E_G	5222636
Surr: 4-Bromofluorobenzene	110		% 74-125	50	10/02/09 16:40	E_G	5230041
Surr: 4-Bromofluorobenzene	91.7		% 74-125	1	09/29/09 10:53	E_G	5222636
Surr: Toluene-d8	99.3		% 82-118	50	10/02/09 16:40	E_G	5230041
Surr: Toluene-d8	114		% 82-118	1	09/29/09 10:53	E_G	5222636

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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: Trip Blank **Collected:** 09/25/2009 14:30 **SPL Sample ID:** 09091282-06

Site: Aztec, NM

Analyses/Method	Result	QUAL	Rep.Limit		Dil. Factor	Date Analyzed	Analyst	Seq. #
VOLATILE ORGANICS BY METHOD 8260B				**MCL**	**SW8260B**	**Units: ug/L**		
Benzene	ND		1		1	09/29/09 2:13	E_G	5222629
Ethylbenzene	ND		1		1	09/29/09 2:13	E_G	5222629
Naphthalene	ND		1		1	09/29/09 2:13	E_G	5222629
Toluene	ND		1		1	09/29/09 2:13	E_G	5222629
m,p-Xylene	ND		2		1	09/29/09 2:13	E_G	5222629
o-Xylene	ND		1		1	09/29/09 2:13	E_G	5222629
Xylenes,Total	ND		1		1	09/29/09 2:13	E_G	5222629
Surr: 1,2-Dichloroethane-d4	97.4		%	78-116	1	09/29/09 2:13	E_G	5222629
Surr: 4-Bromofluorobenzene	110		%	74-125	1	09/29/09 2:13	E_G	5222629
Surr: Toluene-d8	103		%	82-118	1	09/29/09 2:13	E_G	5222629

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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

Conoco Phillips

COP Johnston Fed4

Analysis: Metals by Method 6010B, Dissolved
Method: SW6010B
WorkOrder: 09091282
Lab Batch ID: 94143

Method Blank

RunID: ICP2_091006A-5233393 Units: mg/L
Analysis Date: 10/06/2009 9:44 Analyst: AB1
Preparation Date: 09/28/2009 10:00 Prep By: R_V Method SW3005A

Analyte	Result	Rep Limit
Iron	ND	0.02
Manganese	ND	0.005

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09091282-01C	MW-1
09091282-02C	MW-2
09091282-03C	MW-3
09091282-04C	MW-4

Laboratory Control Sample (LCS)

RunID: ICP2_091006A-5233394 Units: mg/L
Analysis Date: 10/06/2009 9:48 Analyst: AB1
Preparation Date: 09/28/2009 10:00 Prep By: R_V Method SW3005A

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Iron	1.000	1.053	105.3	80	120
Manganese	1.000	1.067	106.7	80	120

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

Sample Spiked: 09091275-02
RunID: ICP2_091006A-5233396 Units: mg/L
Analysis Date: 10/06/2009 9:57 Analyst: AB1
Preparation Date: 09/28/2009 10:00 Prep By: R_V Method SW3005A

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Iron	0.3398	1	1.416	107.6	1	1.413	107.3	0.2121	20	75	125
Manganese	0.02860	1	1.092	106.3	1	1.092	106.3	0	20	75	125

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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

Conoco Phillips

COP Johnston Fed4

Analysis: Volatile Organics by Method 8260B
Method: SW8260B
WorkOrder: 09091282
Lab Batch ID: R284934

Method Blank

RunID: L_090928E-5222628 Units: ug/L
Analysis Date: 09/29/2009 1:49 Analyst: E_G

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Naphthalene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	2.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,2-Dichloroethane-d4	98.0	78-116
Surr: 4-Bromofluorobenzene	109.8	74-125
Surr: Toluene-d8	102.5	82-118

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09091282-01A	MW-1
09091282-02A	MW-2
09091282-03A	MW-3
09091282-04A	MW-4
09091282-05A	Duplicate
09091282-06A	Trip Blank

Laboratory Control Sample (LCS)

RunID: L_090928E-5222627 Units: ug/L
Analysis Date: 09/29/2009 1:02 Analyst: E_G

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	18.7	93.6	74	123
Ethylbenzene	20.0	20.0	99.8	72	127
Naphthalene	20.0	16.9	84.6	33	148
Toluene	20.0	19.3	96.6	74	126
m,p-Xylene	40.0	40.8	102	71	129
o-Xylene	20.0	20.4	102	74	130
Xylenes,Total	60.0	61.2	102	71	130
Surr: 1,2-Dichloroethane-d4	50.0	48.1	96.2	78	116
Surr: 4-Bromofluorobenzene	50.0	52.4	105	74	125
Surr: Toluene-d8	50.0	50.5	101	82	118

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

Sample Spiked: 09091282-02
RunID: L_090928E-5222631 Units: ug/L
Analysis Date: 09/29/2009 3:24 Analyst: E_G

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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

Conoco Phillips

COP Johnston Fed4

Analysis: Volatile Organics by Method 8260B
Method: SW8260B
WorkOrder: 09091282
Lab Batch ID: R284934

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	18.8	93.8	20	19.4	96.9	3.34	22	70	124
Ethylbenzene	ND	20	19.6	98.2	20	20.1	101	2.34	20	76	122
Naphthalene	ND	20	15.5	77.7	20	16.2	81.0	4.20	20	42	140
Toluene	ND	20	19.3	96.5	20	19.8	99.0	2.63	24	80	117
m,p-Xylene	ND	40	40.9	102	40	42.3	106	3.55	20	69	127
o-Xylene	ND	20	21.1	106	20	21.4	107	1.16	20	84	114
Xylenes,Total	ND	60	62	100	60	64	110	2.7	20	69	127
Surr: 1,2-Dichloroethane-d4	ND	50	48	96.0	50	47.8	95.6	0.436	30	78	116
Surr: 4-Bromofluorobenzene	ND	50	54.2	108	50	53.3	107	1.63	30	74	125
Surr: Toluene-d8	ND	50	50.6	101	50	50.7	101	0.0592	30	82	118

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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

Conoco Phillips
COP Johnston Fed4

Analysis: Volatile Organics by Method 8260B
Method: SW8260B
WorkOrder: 09091282
Lab Batch ID: R285393

Method Blank

RunID: L_091002B-5230036 Units: ug/L
Analysis Date: 10/02/2009 13:08 Analyst: E_G

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09091282-01A	MW-1
09091282-05A	Duplicate

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	2.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,2-Dichloroethane-d4	98.2	78-116
Surr: 4-Bromofluorobenzene	110.3	74-125
Surr: Toluene-d8	103.6	82-118

Laboratory Control Sample (LCS)

RunID: L_091002B-5230035 Units: ug/L
Analysis Date: 10/02/2009 12:10 Analyst: E_G

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	21.3	106	74	123
Ethylbenzene	20.0	22.6	113	72	127
Toluene	20.0	21.7	109	74	126
m,p-Xylene	40.0	47.3	118	71	129
o-Xylene	20.0	23.6	118	74	130
Xylenes,Total	60.0	70.9	118	71	130
Surr: 1,2-Dichloroethane-d4	50.0	48.8	97.6	78	116
Surr: 4-Bromofluorobenzene	50.0	53.9	108	74	125
Surr: Toluene-d8	50.0	49.9	99.8	82	118

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

Sample Spiked: 09091216-03
RunID: L_091002B-5230038 Units: ug/L
Analysis Date: 10/02/2009 15:29 Analyst: E_G

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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

Conoco Phillips

COP Johnston Fed4

Analysis: Volatile Organics by Method 8260B **WorkOrder:** 09091282
Method: SW8260B **Lab Batch ID:** R285393

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	17.6	88.2	20	19.1	95.6	8.05	22	70	124
Ethylbenzene	ND	20	18.7	93.5	20	20.0	100	6.84	20	76	122
Toluene	ND	20	18.2	90.9	20	19.7	98.6	8.06	24	80	117
m,p-Xylene	ND	40	39.3	98.3	40	42.3	106	7.26	20	69	127
o-Xylene	ND	20	19.7	98.5	20	21.1	106	7.11	20	84	114
Xylenes,Total	ND	60	59	98	60	63	110	7.2	20	69	127
Surr: 1,2-Dichloroethane-d4	ND	50	47.8	95.6	50	47.2	94.4	1.35	30	78	116
Surr: 4-Bromofluorobenzene	ND	50	54.7	109	50	54.4	109	0.702	30	74	125
Surr: Toluene-d8	ND	50	50.1	100	50	50.1	100	0.0579	30	82	118

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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

Conoco Phillips

COP Johnston Fed4

Analysis: Ion Chromatography **WorkOrder:** 09091282
Method: E300.0 **Lab Batch ID:** R284904

Method Blank

RunID: IC2_090928A-5222022 Units: mg/L
Analysis Date: 09/28/2009 9:56 Analyst: BDG

Analyte	Result	Rep Limit
Sulfate	ND	0.50

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09091282-01B	MW-1
09091282-03B	MW-3
09091282-04B	MW-4

Laboratory Control Sample (LCS)

RunID: IC2_090928A-5222023 Units: mg/L
Analysis Date: 09/28/2009 10:12 Analyst: BDG

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Sulfate	10.00	10.25	102.5	85	115

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

Sample Spiked: 09091282-01
RunID: IC2_090928A-5222044 Units: mg/L
Analysis Date: 09/28/2009 18:01 Analyst: BDG

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Sulfate	428.9	500	984.7	111.2	500	909.4	96.10	7.947	20	80	120

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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

Conoco Phillips

COP Johnston Fed4

Analysis: Ion Chromatography **WorkOrder:** 09091282
Method: E300.0 **Lab Batch ID:** R284904A

Method Blank

RunID: IC2_090928A-5222022 Units: mg/L
Analysis Date: 09/28/2009 9:56 Analyst: BDG

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09091282-02B	MW-2

Analyte	Result	Rep Limit
Sulfate	ND	0.50

Laboratory Control Sample (LCS)

RunID: IC2_090928A-5222023 Units: mg/L
Analysis Date: 09/28/2009 10:12 Analyst: BDG

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Sulfate	10.00	10.25	102.5	85	115

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

Sample Spiked: 09091282-02
RunID: IC2_090928A-5222046 Units: mg/L
Analysis Date: 09/28/2009 18:35 Analyst: BDG

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Sulfate	1258	2000	3277	101.0	2000	3245	99.36	0.9856	20	80	120

Qualifiers:

ND/U - Not Detected at the Reporting Limit
B/V - 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.

Sample Receipt Checklist

And

Chain of Custody

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

Sample Receipt Checklist

Workorder:	09091282	Received By:	AMV
Date and Time Received:	9/26/2009 9:30:00 AM	Carrier name:	Fedex-Priority
Temperature:	3.3°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: _____

SPL, Inc.
Analysis Request & Chain of Custody Record

SPL Workorder No. 1009128 2 | 331739 | page 1 of 1

Client Name: TetraTech / ConocoPhillips
Address: 6121 Indian School Rd NE Ste 200
City Albuquerque State NM Zip 87110
Phone/Fax: 505.237.8440 505.237.8656
Client Contact: Kelly Blanchard Email: Kelly.blanchard@tetratech.com
Project Name/No.: Johnston Federal #4
Site Name:
Site Location: Aztec, NM
Invoice To: ConocoPhillips Ph:

SAMPLE ID	DATE	TIME	comp	grab	matrix (W=water S=soil O=oil A=air SL=sludge E=encore X=other)	bottle (P=plastic A=amber glass G=glass V=vial X=other)	size (1=1 liter 4=4oz 40=vial 8=8oz 16=16oz X=other)	pres. (1=HCl 2=HNO3 3=H2SO4 X=other)	Number of Containers	Requested Analysis: BTEX ONLY	NAPHTHALENE	Sulfate	Dissolved Manganese using FIELD FILTERED					
MW-1	9/25/09	1115		X	W	V	40	1	3	X	X							
MW-1	9/25/09	1115		X	W	P	16	NONE	2			X	X					
MW-2	9/25/09	1030		X	W	V	40	1	3	X	X							
MW-2	9/25/09	1030		X	W	P	16	NONE	2			X	X					
MW-3	9/25/09	1005		X	W	V	40	1	3	X	X							
MW-3	9/25/09	1005		X	W	P	16	NONE	2			X	X					
MW-4	9/25/09	0930		X	W	V	40	1	3	X	X							
MW-4	9/25/09	0930		X	W	P	16	NONE	2			X	X					
Duplicate	9/25/09	1130		X	W	V	40	1	3	X								
Trip Blank	9/25/09	1430			W	V	40	1	2	X								

Client/Consultant Remarks: Please filter and preserve metals container prior to analysis

Laboratory remarks:

Intact? Y N
Ice? Y N
Temp: 3.3

Requested TAT
- ☐ 1 Business Day
- ☐ 2 Business Days
- ☐ 3 Business Days
- ☐ Other
- ☐ Contract
- ☒ Standard

Rush TAT requires prior notice

Special Reporting Requirements Results: Fax ☐ Email ☐ PDF ☒
Standard QC ☒ Level 3 QC ☐ Level 4 QC ☐ TX TRRP ☐ LA RECAP ☐

Special Detection Limits (specify):

PM review (initial): KO

	date	time		
1. Relinquished by Sampler:	9/25/09	1450	2. Received by:	
3. Relinquished by:	date	time	4. Received by:	
5. Relinquished by:	9/26/09	930	6. Received by Laboratory:	Amanda Vickerman

☒ 8880 Interchange Drive, Houston, TX 77054 (713) 660-0901
☐ 500 Ambassador Caffery Parkway, Scott, LA 70583 (337) 237-4775
☐ 459 Hughes Drive, Traverse City, MI 49686 (231) 947-5777