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JUN 2010

DECEMBER 2009 QUARTERLY GROUNDWATER MONITORING REPORT

CONOCOPHILLIPS
HOWELL K No. 1
SAN JUAN COUNTY, NEW MEXICO

OCD # _____

API 300-045-09313

Prepared for:

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June 2010

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ANNUAL GROUNDWATER MONITORING
HOWELL K NO. 1, SAN JUAN COUNTY, NEW MEXICO

1.0 INTRODUCTION

This report presents the results of a quarterly groundwater monitoring event conducted by Tetra Tech, Inc. (Tetra Tech) in Decmber of 2009, at the ConocoPhillips Howell K No. 1 site, located on BLM land, approximately ½ mile southeast of Navajo Lake State Park and 10 miles east of Aztec in Unit Letter K, Section 21, Township 30N, Range 8W of San Juan County, New Mexico (Site). The Site consists of a gas production well and associated equipment and installations. The location and general features of the Site are shown on **Figures 1** and **2**, respectively.

1.1 Site Background

The environmental investigation at the Site began in August 2005 with the excavation of approximately 4000 cubic yards of hydrocarbon impacted soil from an area southwest of the wellhead at the Howell K No. 1 site. The hydrocarbon impacted soils were discovered in the area during below grade tank removal activities. The final dimensions of the excavation were 70 feet by 50 feet by 36 feet deep (groundwater was encountered at a depth of approximately 34 feet below ground surface (bgs). Once this extent had been reached, the excavation was stopped due to the inability of the equipment to operate safely at this depth; however, the limits of the hydrocarbon impact had not been fully delineated. The excavation was backfilled with clean soil. In March 2006, one groundwater monitoring well (MW-1) was installed in the general area of the backfilled excavation by Envirotech. The location of this well is shown on **Figure 2**.

Due to the transition of Site consulting responsibilities from Lode Star LLC of Farmington, NM, to Tetra Tech following the acquisition of Burlington Resources by ConocoPhillips Company in March 2006, groundwater monitoring was not performed at the Site in March and June 2007. Tetra Tech began sampling groundwater at the Howell K No. 1 site in November of 2007 using MW-1 and continued to do so until August of 2008, when 3 additional monitoring wells were installed at the Site by WDC Exploration and Wells of Peralta, NM and under Tetra Tech supervision. Additional wells were installed in response to a request by the New Mexico Oil Conservation Division (OCD) for Site characterization and enhanced laboratory analyses. This request was communicated to Tetra Tech during an April 2008 meeting conducted in Santa Fe, New Mexico with Glenn Von Gonten, OCD Environmental Bureau Hydrologist. Groundwater Monitoring Well MW-2 was installed upgradient of MW-1 and Monitoring Wells MW-3 and MW-4 were installed down-gradient of MW-1 (**Figure 2**). A generalized geologic cross-section was compiled using subsurface data collected from each boring location during installation of Monitoring Wells MW-2, MW-3 and MW-4. Monitoring Wells MW-2 and MW-4 are represented on the cross-section which can be seen as **Figure 3**. October 2008 marked the first quarterly groundwater monitoring event to

include all 4 monitoring wells for analysis at the Site. A summary of the Howell K No. 1 site history can be seen in **Table 1**.

2.0 MONITORING SUMMARY AND SAMPLING METHODOLOGY AND ANALYTICAL RESULTS

2.1 Monitoring Summary

Quarterly groundwater sampling was conducted by Tetra Tech on December 15, 2009. The groundwater sampling event included samples from Monitoring Wells MW-1, MW-2, MW-3 and MW-4. Groundwater levels were measured in each site monitoring well prior to sampling and can be found in **Table 2**. Groundwater elevations for MW-1, however, can not be calculated or included on the groundwater contour map due to the gradual, continuous, upward shifting of the PVC well casing. The continual shifting of the PVC casing of MW-1 is likely due to the proximity of MW-1 to the 2005, underground tank removal excavation and the severe settling and shifting of the fill material in this area. Groundwater elevations are calculated from top of casing elevations which were derived from survey data collected from each site monitoring well by Tetra Tech on August 14, 2008. Survey data obtained from MW-1 is no longer valid due to the uplifting of the well casing which will continue to change over time; therefore MW-1 will no longer be factored into future groundwater elevation contour maps. The groundwater flow direction is to the west, based on groundwater elevation data collected on December 15, 2009 from MW-2, MW-3 and MW-4, as seen on **Figure 4**.

2.2 Groundwater Sampling Methodology

During the sampling event, each monitoring well was purged either of three casing volumes of water or was purged until groundwater parameters had stabilized. Measured groundwater parameters included; temperature, pH, conductivity, total dissolved solids (TDS), oxidation-reduction potential (ORP) and dissolved oxygen (DO), and were collected using a YSI 556 multi-parameter sonde. A 1.5-inch clear, polyethylene, dedicated bailer was used to purge each well and to collect the groundwater samples. The purge water generated during the event was disposed of in the produced water tank located on site (**Figure 2**). The groundwater samples were placed in laboratory prepared bottles, packed on ice, and shipped with chain-of-custody documentation to Southern Petroleum Laboratory (SPL) in Houston, Texas. All groundwater samples collected were analyzed for the presence of benzene, toluene, ethylbenezene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260B, dissolved iron and manganese by EPA Method 6010B, and sulfate and fluoride by EPA method 300.0. The dissolved metals samples were collected in unpreserved containers supplied by the laboratory, which were filtered and preserved by laboratory personnel prior to analysis for dissolved metals. Dissolved metals testing will continue for metals exceeding NMWQCC drinking water standards.

2.3 Groundwater Sampling Analytical Results

Samples collected from MW-1, MW-2, MW-3, MW-4 on December 15, 2009 and indicate that groundwater concentrations for BTEX were below laboratory method detection limits (MDL).

Although BTEX constituents were found to be below NMWQCC standards during the December 2009 quarterly analysis, other constituents were found to be above standards. Analyses of samples collected from all 4 wells on Site were found to be above the NMWQCC standard for sulfate. Analysis of samples from MW-1, MW-3 and MW-4 were found to be above standard for dissolved manganese. Also, dissolved iron was found to be above standard in MW-1 and MW-3. Results for fluoride concentrations cannot be compared to the NMWQCC standard for this quarter due to the laboratory detection limit being set at either 50mg/L or 100 mg/L which are both well above the standard of 1.6 mg/L. Fluoride will continue to be included in the analyte list for the Howell K No. 1 site with a laboratory detection limit of < 1.6 mg/L. **Table 3** lists the analytical results from groundwater sampling done during December of 2009. Groundwater sampling field forms showing field parameters can be found in **Appendix A** and the corresponding laboratory analysis reports including quality control summaries can be found in **Appendix B**.

3.0 CONCLUSIONS

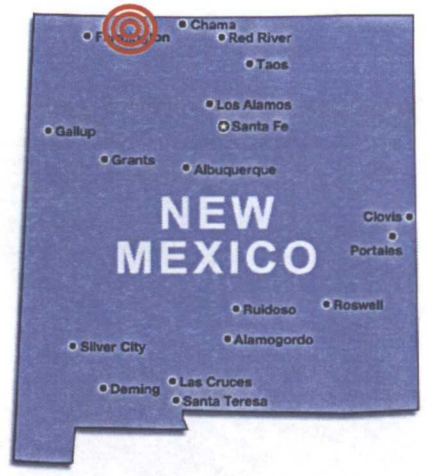
Based on the historical groundwater quality data, groundwater samples collected from MW-1 have never exceeded NMWQCC groundwater quality standards for BTEX constituents during sampling conducted from March 2006 to December 2009. Frequently, BTEX concentrations were found to be below the minimum laboratory detection limits for these constituents. In addition, groundwater samples collected from MW-2, MW-3 and MW-4 have also not exceeded NMWQCC groundwater quality standards for BTEX constituents from October 2008 to December 2009. Although BTEX is below standards in all 4 monitoring wells, other constituents of concern have concentrations above NMWQCC standard, therefore, Tetra Tech recommends the continuation of quarterly groundwater monitoring of sulfate, manganese and fluoride until these constituent concentrations are also below NMWQCC standards, appear stable or reach regional background levels. Please contact Kelly Blanchard at 505-237-8440 or kelly.blanchard@tetratech.com if you have any questions or require additional information.

FIGURES

ConocoPhillips - High Resolution Aerial Imagery 2008

FIGURE 1.

Site Location Map
ConocoPhillips
Howell K No. 1
Aztec, NM



Approximate ConocoPhillips Howell K No. 1 Site location

Latitude = 36.79505 deg N
Longitude = -107.68474 deg W

N

TETRA TECH, INC.

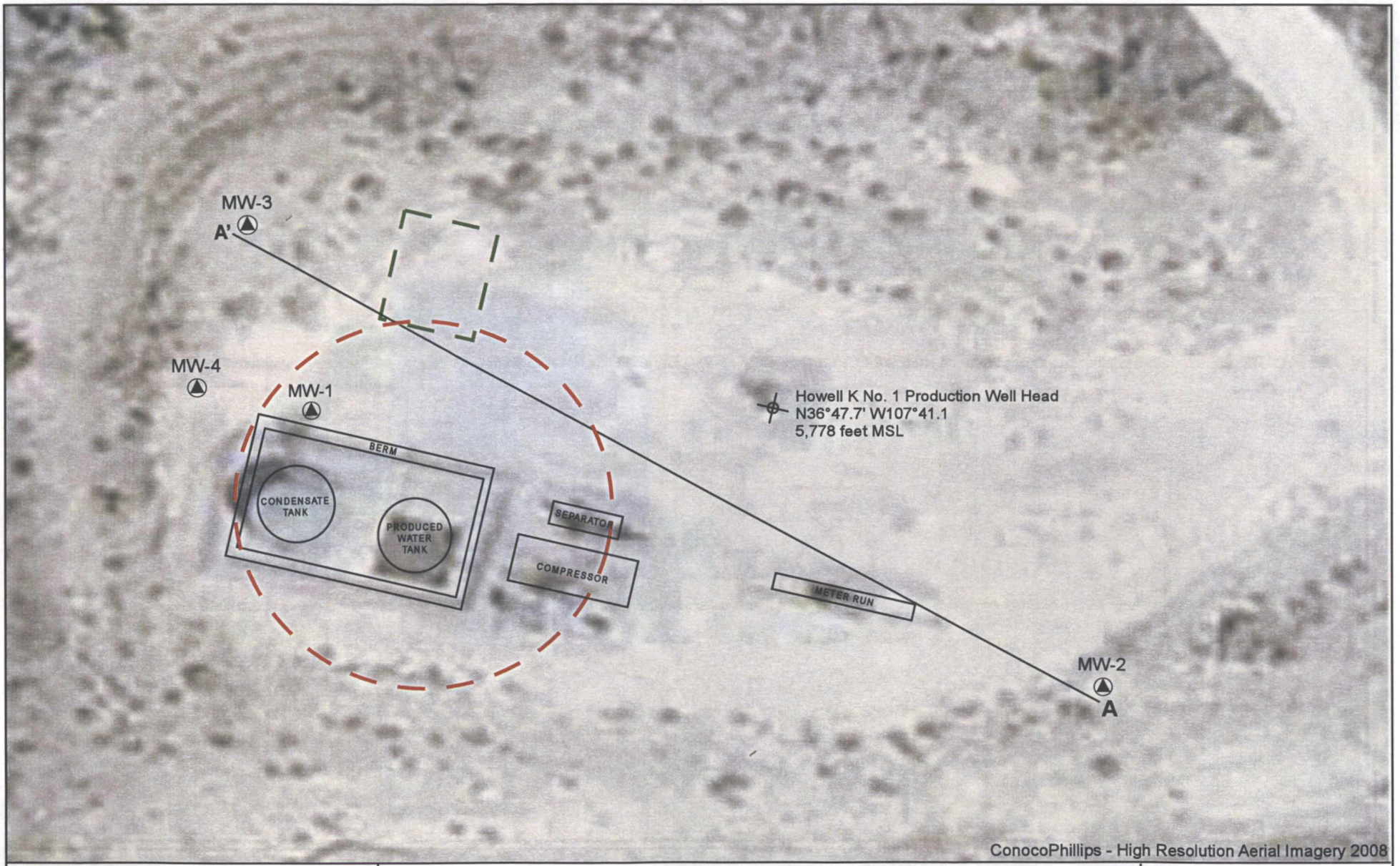


FIGURE 2:
SITE LAYOUT MAP
CONOCOPHILLIPS
HOWELL K No. 1
Unit K, Sec 21, Twp 30N, Rng 8W
San Juan County, New Mexico
Revised by CFM 06/10

LEGEND

WELLHEAD

MONITORING WELL

GENERAL AREA OF UNDERGROUND TANK REMOVAL EXCAVATION

GENERAL AREA OF UNLINED EARTHEN PIT EXCAVATION

0 15 30
FEET

N

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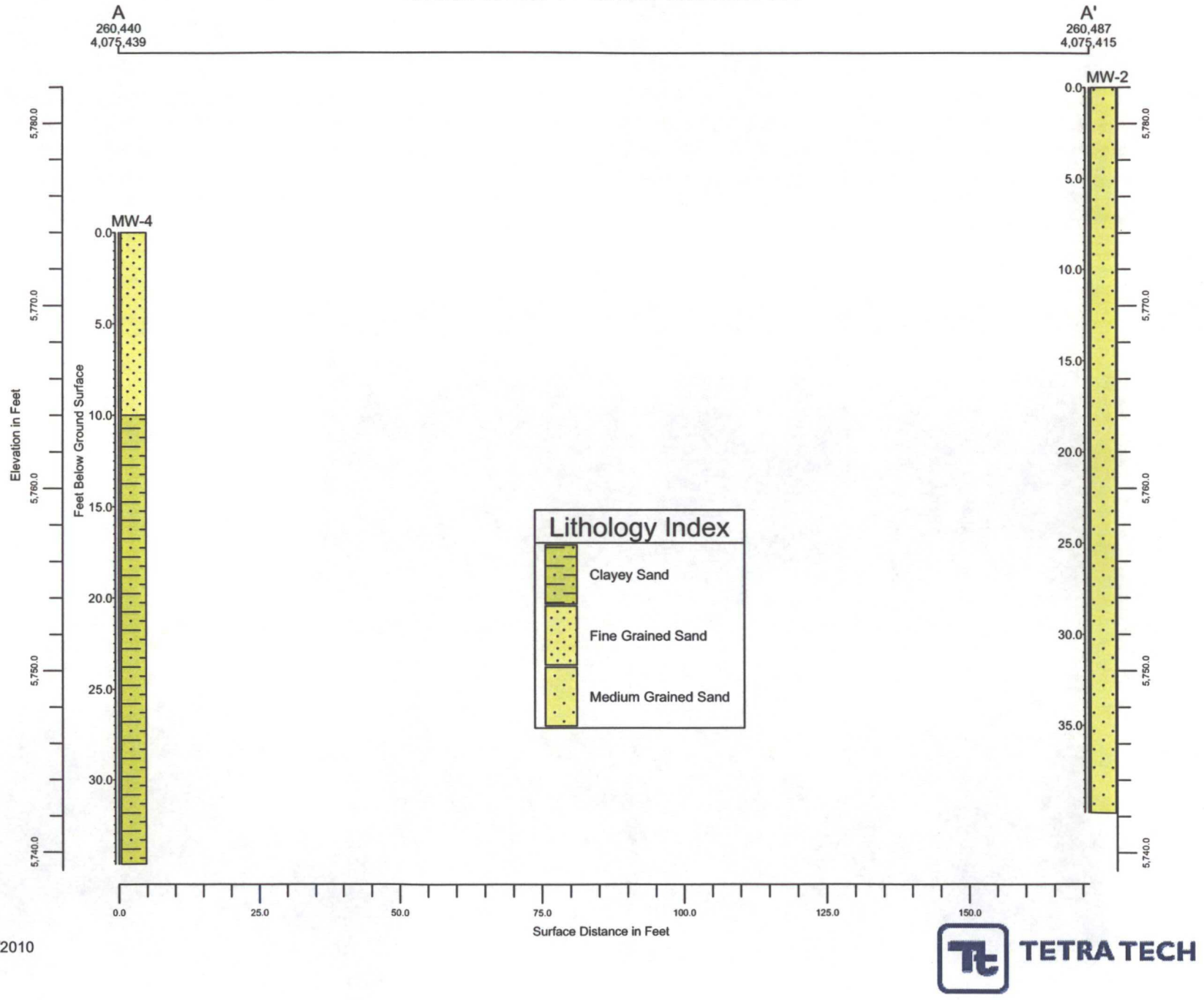
Howell K No. 1 - Cross-Section A-A'



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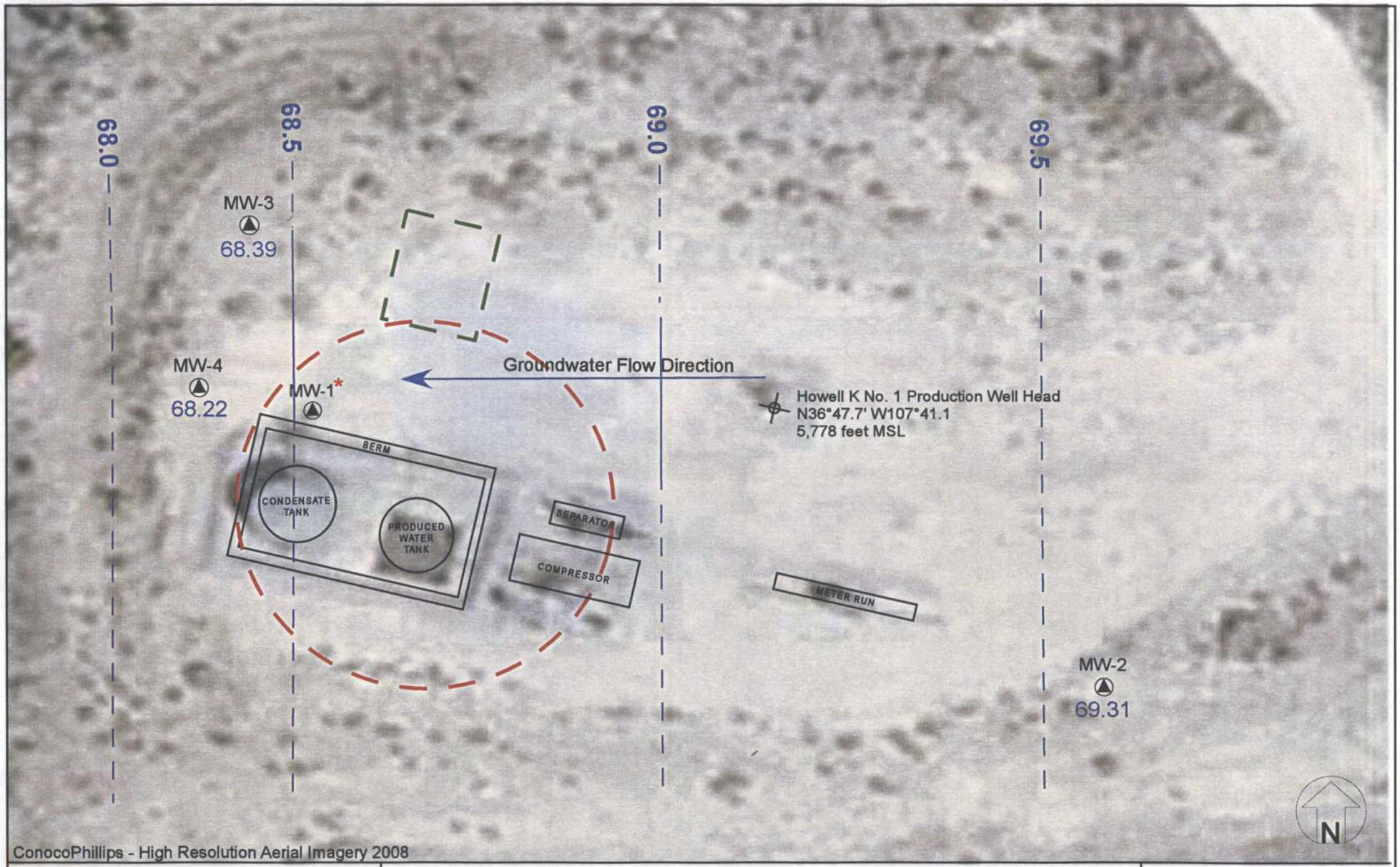

FIGURE 4:
DECEMBER 2009 GROUNDWATER ELEVATION CONTOUR MAP
CONOCOPHILLIPS COMPANY
HOWELL K No. 1
Unit K - T30N, R8W, Section 21
San Juan County, New Mexico
Revised by CFM 06/10

LEGEND

- WELLHEAD
- MONITORING WELL
- GENERAL AREA OF UNDERGROUND TANK REMOVAL EXCAVATION
- GENERAL AREA OF UNLINED EARTHEN PIT EXCAVATION
- GROUNDWATER ELEVATION (dashed where inferred)
- * Groundwater elevations can not be calculated accurately due to continual upward shifting of the PVC casing (see text of section 2.1, Monitoring Summary, for more information)

0 15 30
FEET

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TABLES

Table 1. Site History Timeline

Date/Time Period	Event/Action	Description/Comments
July 26, through August 18, 2005	Initial Site Assessment	Environmental investigation began with the excavation of approximately 4000 cubic yards of impacted soil from an area southwest of the Howell K No.1 well head. Impacted soils were discovered during the removal activities of a below grade tank. Dimensions of the excavation were approximately 70 feet long by 50 feet wide by 36 feet deep. Groundwater was encountered at approximately 34 feet and soils were still impacted at 36 feet deep, the point at which excavation machinery was stopped at the practical limit for safe operation. The total verticle extent of hydrocarbon impacts were not completely deliniated. Soil was treated with 600 total gallons of potassium permanganate solution. The excavation area was backfilled with clean soil.
March 10, 2006	Groundwater monitoring well installation	One ground water monitoring well, MW-1, was installed in the center of the backfilled excavation by Envirotech. Total depth of well was set at 35 feet.
March 31, 2006	Site Transfer	ConocoPhillips Company completed acquisition of Burlington Resources.
March and June 2007	Groundwater monitoring not performed	After the acquisition of Burlington Resources by ConocoPhillips, consulting responsibilities were transferred from Lode Star LLC of Farmington New Mexico to Tetra Tech of Albuquerque. Due to the transition, first and second quarter sampling of 2007 was not performed.
November 9, 2007 through March 19, 2008	Groundwater monitoring	Tetra Tech began sampling the Howell K No. 1 site quarterly in November of 2007. Groundwater was sampled from MW-1 and was analyzed for BTEX constituents. No constituents were detected at levels that exceeded the NMWQCC standards at any point during this period.
April 1, 2008	Additional Monitoring Requested by OCD	Oil Conservation Division of NM Energy, Minerals, and Resources Dept. indicates additional investigation and sampling is necessary for closure consideration during a meeting with Glenn Von Gonten.
July 23, 2008	Groundwater monitoring postponed	Groundwater monitoring of MW-1 was postponed after it was found that there was an obstruction caused by settling and shifting of the MW-1 casing. It was determined that the obstruction could be avoided by using a smaller bailer to collect samples. Sampling was postponed and was set to follow upcoming monitoring well installation so that proper sampling materials could be used.
August 13 and 14, 2008	Groundwater monitoring well installation and groundwater monitoring	Three additional groundwater monitoring wells (MW-2, MW-3 and MW-4) were installed by WDC and overseen by Tetra Tech. MW-2 was installed up-gradient of MW-1. Both MW-3 and MW-4 were installed down-gradient of MW-1. All wells were developed by purging approximately 80 gallons of fluid using a surge block and a purge pump. A sample was collected from MW-1 on August 14th since sampling could not be done in July of 2008. A 3/4 inch disposable bailer was used to avoid obstruction in MW-1. Sample was analyzed for BTEX constituents. All constituents were below NMWQCC standards.
October 24, 2008	Groundwater monitoring	Third quarter 2008 groundwater monitoring was completed and was the first quarter of sampling to include all four monitoring wells on site. A baseline suite was completed including major ions, total metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs) including BTEX, diesel range organics, and gasoline range organics. All BTEX constituents were below NMWQCC standards. All four wells were above standard for sulfate, and showed elevated total iron and total manganese concentrations. MW-4 was also above the NMWWCC standard for Fluoride.
January 30, 2009	4th quarter 2008 groundwater monitoring	Tetra Tech conducted forth quarter 2008 groundwater monitoring at the site for BTEX constituents in all four monitoring wells. All wells are below NMWQCC standards for BTEX .

Date/Time Period	Event/Action	Description/Comments
September 25,2009	2009 annual groundwater monitoring	Tetra Tech conducted 2009 annual groundwater monitoring of MW-2, MW-3 and MW-4 for BTEX, dissoved iron, dissolved manganese, sulfate, and fluoride. All three wells were below NMWQCC standards for BTEX. All three wells were above standard for sulfate. Dissolved manganese was above standard in MW-3 and MW-4 and flouride was above standard in MW-4. Dissolved metals analyses conducted for the first time since standards are based on dissolved metals testing. OCD concurred, allowing total metals testing to be discontinued.
October 18, 2009	Groundwater monitoring	Tetra Tech conducted 2009 annual groundwater monitoring of MW-1 for BTEX, dissoved iron, dissolved manganese, sulfate, and fluoride. MW-1 was below NMWQCC standards for BTEX. Sulfate, dissolved manganese and dissolved iron were above standard in MW-1.
December 15, 2009	Groundwater monitoring	Tetra Tech conducted quarterly groundwater monitoring at the site for BTEX, dissolved iron, dissolved manganese, sulfate and flouride. All four monitoring wells are below NMWQCC standards for BTEX . All four monitoring wells were above standard for sulfate. MW-1, MW-3 and MW-4 were above standard for dissolved manganese and MW-3 and MW-1 were also above standard for dissolved iron.

Table 2. Groundwater Elevation Data Summary

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	37.47	21.0 - 36.0	97.84	3/22/2006	28.54	69.30
				6/21/2006	29.15	68.69
				10/19/2006	27.83	70.01
				12/12/2006	28.22	69.62
				March 2006	NS	--
				June 2006	NS	--
				11/9/2007	29.03	68.81
				1/15/2008	28.34	69.5
				3/19/2008	NM	NM
				7/23/2008	28.46	69.38
				10/24/2008	29.91	67.93
				1/30/2009	28.37	69.47
				9/25/2009	29.95	67.89
				10/18/2009	29.97	67.87
				12/15/2009	29.51	-- (1)
MW-2	39.81	21.0 - 36.0	95.28	10/24/2008	25.74	69.54
				1/30/2009	24.74	70.54
				9/25/2009	26.48	68.80
				12/15/2009	25.97	69.31
MW-3	37.47	19.0 - 34.0	95.44	10/24/2008	26.95	68.49
				1/30/2009	25.92	69.52
				9/25/2009	27.57	67.87
				12/15/2009	27.05	68.39
MW-4	34.66	17.0 - 32.0	95.36	10/24/2008	NM	NM
				1/30/2009	26.00	69.36
				9/25/2009	27.64	67.72
				12/15/2009	27.14	68.22

ft = Feet

TOC = Top of casing

bgs = below ground surface

* = Elevation relative to wellhead

(1) = Groundwater elevations can not be calculated accurately due to continual upward shifting of the PVC casing (see text of section 2.1, Monitoring Summary, of this report for more information)

NS = Not Sampled (quarters not sampled due to change in consulting responsibilities from Lodestar LLC to Tetra Tech Inc.)
NM = Not measured

Table 3. Groundwater Analytical Results Summary

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)	Dissolved Iron (mg/L)	Dissolved Manganese (mg/L)
MW-1	3/22/2006	ND	ND	1	2	NA	NA	NA	NA
	6/21/2006	1.4	1.4	ND	10.6	NA	NA	NA	NA
	10/19/2006	ND	ND	ND	1.1	NA	NA	NA	NA
	12/12/2006	ND	0.5	0.4	2.1	NA	NA	NA	NA
	11/9/2007	<0.5 U	<0.7 U	<0.8 U	<0.9 J	NA	NA	NA	NA
	1/15/2008	<0.5 U	<0.7 U	<0.8 U	<0.8 U	NA	NA	NA	NA
	3/19/2008	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
	8/14/2008	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
	10/24/2008	<0.5	<0.5	<0.5	<0.5	< 2.0	**2390**	32.1*	13.4*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	10/18/2009	<1.0	<1.0	<1.0	<1.0	0.881	**3840**	**2.24**	**17.4**
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 50	**3290**	**1.77**	**16.5**
MW-2	10/24/2008	<0.5 U	<0.5 U	<0.5 U	<0.5 U	< 2	**1480**	3.28*	0.231*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	9/25/2009	<1.0	<1.0	<1.0	<1.0	1.09	**1700**	<0.02	<0.005
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 100	**1570**	<0.02	<0.005
MW-3	10/24/2008	<0.5 U	<0.5 U	<0.5 U	<0.5 U	< 2	**1480**	3.38*	1.31*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	9/25/2009	<1.0	<1.0	<1.0	<1.0	0.995	**1840**	<0.02	0
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 50	**3510**	**1.35**	**0.32**
MW-4	10/24/2008	<0.5 U	<0.5 U	<0.5 U	<0.5 U	**2.43**	**3,400**	2.7*	7.79*
	1/30/2009	<0.5 U	<0.5 U	<0.5 U	<0.5 U	NA	NA	NA	NA
	9/25/2009	<1.0	<1.0	<1.0	<1.0	**2.47**	**3860**	<0.02	**8**
	12/15/2009	<1.0	<1.0	<1.0	<1.0	< 50	**4540**	0.0258	**7.4**
NMWQCC Standards		**10 (µg/L)**	**750 (µg/L)**	**750 (µg/L)**	**620 (µg/L)**	**1.6 (mg/L)**	**600 (mg/L)**	**1 (mg/L)**	**0.2 (mg/L)**

Explanation
ND = Not Detected
NMWQCC = New Mexico Water Quality Control Commission
mg/L = milligrams per liter (parts per million)
µg/L = micrograms per liter (parts per billion)
NA = Not Analyzed
<0.7 = Below laboratory detection limit of 0.7 ug/L
U = Analyte was analyzed for but not detected at the indicated MDL
Bold = concentrations that exceed the NMWQCC limits
* = Results recorded by total metals analysis, not comparable to NMWQCC standards which are based on dissolved metals concentrations

APPENDIX A

GROUNDWATER SAMPLING FIELD FORMS

TETRA TECH, INC.

WATER SAMPLING FIELD FORM

Project Name Howell K1 Page 1 of 4

Project No.

Site Location San Juan County, NM

Site/Well No. MW-1 Coded/ Replicate No. duplicate @ 1510 Date 12/15/09

Weather cold, sunny Time Sampling Began 1340 Time Sampling Completed ~~1355~~ 1455

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface MP Elevation

Total Sounded Depth of Well Below MP 37.47 Water-Level Elevation

Held Depth to Water Below MP 29.51 Diameter of Casing 2"

Wet Water Column in Well 7.96 Gallons Pumped/Bailed Prior to Sampling 3.8

Gallons per Foot 0.16

Gallons in Well 1.27 X 3 = 3.8 Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
SO4, Fl	16 oz plastic	none
Dissolved Mn & Fe	16 oz plastic	none

Remarks parameters not collected due to low volume per bailer, bailer size is .5 inches due to obstruction in well

Sampling Personnel AM, CM

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 Howell K1 Page 2 of 4

Project No.

Site Location San Juan County, NM

Site/Well No. MW-2 Coded/ Replicate No. Date 12/15/01

Weather Cold, Sunny Time Sampling Began 1425 Time Sampling Completed 1440

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface MP Elevation

Total Sounded Depth of Well Below MP 39.81 Water-Level Elevation

Held Depth to Water Below MP 25.97 Diameter of Casing 2"

Wet Water Column in Well 13.84 Gallons Pumped/Bailed Prior to Sampling 7

Gallons per Foot 0.16

Gallons in Well 2.21 x 3 = 6.63 Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)	Vol
1434	14.22	6.84	2615	1.700	2.34	-57.4	4.25 gal
1436	14.22	6.83	2620	1.703	2.19	-57.3	5 gal
1439	14.16	6.82	2621	1.704	2.15	-54.5	6.5 gal

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
SO4, FE	16 oz plastic	none
Dissolved Fe, Mn	"	"

Remarks brown, murky water

Sampling Personnel AM, CM

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: Howell K1

Project No.:

Site Location: San Juan County, NM

Site/Well No.: MW-3 | Coded/ Replicate No.: | Date: 12/15/09

Weather: cold, sunny | Time Sampling Began: 1355 | Time Sampling Completed: 1410

EVACUATION DATA

Description of Measuring Point (MP): Top of Casing

Height of MP Above/Below Land Surface: | MP Elevation:

Total Sounded Depth of Well Below MP: 37.47 | Water-Level Elevation:

Held ____ Depth to Water Below MP: 27.05 | Diameter of Casing: 2"

Wet ____ Water Column in Well: 10.42 | Gallons Pumped/Bailed Prior to Sampling: 5

Gallons per Foot: 0.16

Gallons in Well: 1.66 x 3 = 4.98 | Sampling Pump Intake Setting (feet below land surface):

Purging Equipment: Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm)	TDS (g/L)	DO (mg/L)	ORP (mV)	Vol
1359	14.78	7.18	2980	1.940	2.760	-78.2	1.5gal
1402	14.89	6.89	2901	1.886	2.25	-75.9	3gal
1406	14.98	6.86	2915	1.895	2.02	-72.9	4.5gal

Sampling Equipment: Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
SO4, Fl	1L oz plastic	none
Dissolved Fe, Mn	16 oz plastic	none

Remarks: murky, brown water

Sampling Personnel: AM, CM

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 Howell K1 — Page 4 of 4

Project No.

Site Location San Juan County, NM

Site/Well No. MW-4 — Coded/ Replicate No. — Date 12/15/09

Weather cold, sunny — Time Sampling Began 1330 — Time Sampling Completed 1340

EVACUATION DATA

Description of Measuring Point (MP) Top of Casing

Height of MP Above/Below Land Surface — MP Elevation

Total Sounded Depth of Well Below MP ~~34.66~~ 34.60 — Water-Level Elevation

Held ____ Depth to Water Below MP 27.14 — Diameter of Casing 2"

Wet ____ Water Column in Well 7.46 — Gallons Pumped/Bailed Prior to Sampling 3.5

Gallons per Foot 0.16

Gallons in Well 1.19 x 3 = 3.57 — Sampling Pump Intake Setting (feet below land surface)

Purging Equipment Purge pump / Bailer

SAMPLING DATA/FIELD PARAMETERS

Time	Temperature (°C)	pH	Conductivity (µS/cm³)	TDS (g/L)	DO (mg/L)	ORP (mV)
1333	15.15	6.79	6050	3.935	2.27	-65.0
1337	15.46	6.83	6323	4.105	2.42	-77.8
1340	15.36	6.78	6492	4.220	2.22	-73.8

Vol
1 gal
2.25 gal
3.5 gal

Sampling Equipment Purge Pump/Bailer

Constituents Sampled	Container Description	Preservative
BTEX	3 40mL VOA's	HCl
SO4, Fl	16 oz plastic	none
Dissolved Mn & Fe	16 oz plastic	none

Remarks murky, brown water. no odor

Sampling Personnel AM, CM

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:

09120826

Report To:		Project Name:	COP Howell K-1
Tetra Tech, Inc. Kelly Blanchard 6121 Indian School Road, N.E. Suite 200 Albuquerque NM 87110- ph: (505) 237-8440 fax:		Site:	San Juan County, NM
		Site Address:	
		PO Number:	4510016701
		State:	New Mexico
		State Cert. No.:	
		Date Reported:	1/3/2010

This Report Contains A Total Of 17 Pages

Excluding This Page, Chain Of Custody

And

Any Attachments

1/4/2010

Date

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

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

Case Narrative for:
Conoco Phillips

Certificate of Analysis Number:
09120826

Report To:		Project Name:	COP Howell K-1
Tetra Tech, Inc.		Site:	San Juan County, NM
Kelly Blanchard		Site Address:	
6121 Indian School Road, N.E.			
Suite 200		PO Number:	4510016701
Albuquerque		State:	New Mexico
NM		State Cert. No.:	
87110-		Date Reported:	1/3/2010
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:

EPA300.0- Ion Chromatography:

Due to limited sample volume, a Matrix Spike (MS) or Matrix Spike Duplicate (MSD) was not extracted for Batch ID: R292452. A Laboratory Control Sample (LCS) and a Laboratory Control Sample Duplicate (LCSD) were extracted with the analytical batch and serve as the batch quality control (QC). The LCS and LCSD recovered acceptably and precision criteria were met.

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.

1/4/2010

Erica Cardenas — Date

Project Manager

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:

09120826

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 Howell K-1
Site: San Juan County, NM
Site Address:

PO Number: 4510016701
State: New Mexico
State Cert. No.:
Date Reported: 1/3/2010

Client Sample ID	Lab Sample ID	Matrix	Date Collected	Date Received	COC ID	HOLD
MW-1	09120826-01	Water	12/15/2009 2:55:00 PM	12/19/2009 9:45:00 AM	292847	☐
MW-2	09120826-02	Water	12/15/2009 2:40:00 PM	12/19/2009 9:45:00 AM	292847	☐
MW-3	09120826-03	Water	12/15/2009 2:10:00 PM	12/19/2009 9:45:00 AM	292847	☐
MW-4	09120826-04	Water	12/15/2009 1:40:00 PM	12/19/2009 9:45:00 AM	292847	☐
Duplicate	09120826-05	Water	12/15/2009 3:10:00 PM	12/19/2009 9:45:00 AM	292847	☐
Trip Blank	09120826-06	Water	12/17/2009 11:30:00 AM	12/19/2009 9:45:00 AM	292847	☐

E Cardenas

1/4/2010

Erica Cardenas
Project Manager

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:** 12/15/2009 14:55 **SPL Sample ID:** 09120826-01

Site: San Juan County, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY				**MCL**	**E300.0**	**Units: mg/L**	
Fluoride	ND		50	100	12/28/09 20:44	BDG	5347276
Sulfate	3290		500	1000	12/29/09 16:14	BDG	5347344
METALS BY METHOD 6010B, DISSOLVED				**MCL**	**SW6010B**	**Units: mg/L**	
Iron	1.77		0.02	1	12/29/09 21:46	AB1	5347850
Manganese	16.5		0.005	1	12/29/09 21:46	AB1	5347850

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	12/20/2009 17:30	M_W	1.00

VOLATILE ORGANICS BY METHOD 8260B				**MCL**	**SW8260B**	**Units: ug/L**	
Benzene	ND		1	1	12/25/09 11:01	LU_L	5343867
Ethylbenzene	ND		1	1	12/25/09 11:01	LU_L	5343867
Toluene	ND		1	1	12/25/09 11:01	LU_L	5343867
m,p-Xylene	ND		1	1	12/25/09 11:01	LU_L	5343867
o-Xylene	ND		1	1	12/25/09 11:01	LU_L	5343867
Xylenes,Total	ND		1	1	12/25/09 11:01	LU_L	5343867
Surr: 1,2-Dichloroethane-d4	98.6	%	70-130	1	12/25/09 11:01	LU_L	5343867
Surr: 4-Bromofluorobenzene	103	%	74-125	1	12/25/09 11:01	LU_L	5343867
Surr: Toluene-d8	102	%	82-118	1	12/25/09 11:01	LU_L	5343867

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:** 12/15/2009 14:40 **SPL Sample ID:** 09120826-02

Site: San Juan County, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY				**MCL**	**E300.0**	**Units: mg/L**	
Fluoride	ND		100	200	12/28/09 21:01	BDG	5347277
Sulfate	1570		500	1000	12/29/09 17:51	BDG	5347347
METALS BY METHOD 6010B, DISSOLVED				**MCL**	**SW6010B**	**Units: mg/L**	
Iron	ND		0.02	1	12/29/09 22:30	AB1	5347859
Manganese	ND		0.005	1	12/29/09 22:30	AB1	5347859

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	12/20/2009 17:30	M_W	1.00

VOLATILE ORGANICS BY METHOD 8260B				**MCL**	**SW8260B**	**Units: ug/L**	
Benzene	ND		1	1	12/25/09 11:30	LU_L	5343868
Ethylbenzene	ND		1	1	12/25/09 11:30	LU_L	5343868
Toluene	ND		1	1	12/25/09 11:30	LU_L	5343868
m,p-Xylene	ND		1	1	12/25/09 11:30	LU_L	5343868
o-Xylene	ND		1	1	12/25/09 11:30	LU_L	5343868
Xylenes,Total	ND		1	1	12/25/09 11:30	LU_L	5343868
Surr: 1,2-Dichloroethane-d4	104	%	70-130	1	12/25/09 11:30	LU_L	5343868
Surr: 4-Bromofluorobenzene	103	%	74-125	1	12/25/09 11:30	LU_L	5343868
Surr: Toluene-d8	102	%	82-118	1	12/25/09 11:30	LU_L	5343868

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
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Client Sample ID: MW-3 **Collected:** 12/15/2009 14:10 **SPL Sample ID:** 09120826-03

Site: San Juan County, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY				**MCL**	**E300.0**	**Units: mg/L**	
Fluoride	ND		50	100	12/28/09 21:17	BDG	5347278
Sulfate	3510		2500	5000	12/30/09 12:12	BDG	5349004
METALS BY METHOD 6010B, DISSOLVED				**MCL**	**SW6010B**	**Units: mg/L**	
Iron	1.35		0.02	1	12/29/09 22:35	AB1	5347860
Manganese	0.32		0.005	1	12/29/09 22:35	AB1	5347860

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	12/20/2009 17:30	M_W	1.00

VOLATILE ORGANICS BY METHOD 8260B					**MCL**	**SW8260B**	**Units: ug/L**	
Benzene	ND			1	1	12/25/09 11:57	LU_L	5343869
Ethylbenzene	ND			1	1	12/25/09 11:57	LU_L	5343869
Toluene	ND			1	1	12/25/09 11:57	LU_L	5343869
m,p-Xylene	ND			1	1	12/25/09 11:57	LU_L	5343869
o-Xylene	ND			1	1	12/25/09 11:57	LU_L	5343869
Xylenes,Total	ND			1	1	12/25/09 11:57	LU_L	5343869
Surr: 1,2-Dichloroethane-d4	98.1		%	70-130	1	12/25/09 11:57	LU_L	5343869
Surr: 4-Bromofluorobenzene	103		%	74-125	1	12/25/09 11:57	LU_L	5343869
Surr: Toluene-d8	101		%	82-118	1	12/25/09 11:57	LU_L	5343869

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
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Client Sample ID: MW-4 **Collected:** 12/15/2009 13:40 **SPL Sample ID:** 09120826-04

Site: San Juan County, NM

Analyses/Method	Result	QUAL	Rep.Limit	Dil. Factor	Date Analyzed	Analyst	Seq. #
ION CHROMATOGRAPHY				**MCL**	**E300.0**	**Units: mg/L**	
Fluoride	ND		50	100	12/28/09 21:34	BDG	5347279
Sulfate	4540		500	1000	12/29/09 18:23	BDG	5347348
METALS BY METHOD 6010B, DISSOLVED				**MCL**	**SW6010B**	**Units: mg/L**	
Iron	0.0258		0.02	1	12/29/09 22:40	AB1	5347861
Manganese	7.4		0.005	1	12/29/09 22:40	AB1	5347861

Prep Method	Prep Date	Prep Initials	Prep Factor
SW3005A	12/20/2009 17:30	M_W	1.00

VOLATILE ORGANICS BY METHOD 8260B				**MCL**	**SW8260B**	**Units: ug/L**	
Benzene	ND		1	1	12/25/09 12:26	LU_L	5343870
Ethylbenzene	ND		1	1	12/25/09 12:26	LU_L	5343870
Toluene	ND		1	1	12/25/09 12:26	LU_L	5343870
m,p-Xylene	ND		1	1	12/25/09 12:26	LU_L	5343870
o-Xylene	ND		1	1	12/25/09 12:26	LU_L	5343870
Xylenes,Total	ND		1	1	12/25/09 12:26	LU_L	5343870
Surr: 1,2-Dichloroethane-d4	104	%	70-130	1	12/25/09 12:26	LU_L	5343870
Surr: 4-Bromofluorobenzene	109	%	74-125	1	12/25/09 12:26	LU_L	5343870
Surr: Toluene-d8	102	%	82-118	1	12/25/09 12:26	LU_L	5343870

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:** 12/15/2009 15:10 **SPL Sample ID:** 09120826-05

Site: San Juan County, 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	12/25/09 9:28	LU_L	5343864
Ethylbenzene	ND		1	1	12/25/09 9:28	LU_L	5343864
Toluene	ND		1	1	12/25/09 9:28	LU_L	5343864
m,p-Xylene	ND		1	1	12/25/09 9:28	LU_L	5343864
o-Xylene	ND		1	1	12/25/09 9:28	LU_L	5343864
Xylenes,Total	ND		1	1	12/25/09 9:28	LU_L	5343864
Surr: 1,2-Dichloroethane-d4	105		% 70-130	1	12/25/09 9:28	LU_L	5343864
Surr: 4-Bromofluorobenzene	104		% 74-125	1	12/25/09 9:28	LU_L	5343864
Surr: Toluene-d8	102		% 82-118	1	12/25/09 9:28	LU_L	5343864

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:** 12/17/2009 11:30 **SPL Sample ID:** 09120826-06

Site: San Juan County, 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	12/25/09 8:58	LU_L	5343863
Ethylbenzene	ND		1	1	12/25/09 8:58	LU_L	5343863
Toluene	ND		1	1	12/25/09 8:58	LU_L	5343863
m,p-Xylene	ND		1	1	12/25/09 8:58	LU_L	5343863
o-Xylene	ND		1	1	12/25/09 8:58	LU_L	5343863
Xylenes,Total	ND		1	1	12/25/09 8:58	LU_L	5343863
Surr: 1,2-Dichloroethane-d4	100		% 70-130	1	12/25/09 8:58	LU_L	5343863
Surr: 4-Bromofluorobenzene	102		% 74-125	1	12/25/09 8:58	LU_L	5343863
Surr: Toluene-d8	98.7		% 82-118	1	12/25/09 8:58	LU_L	5343863

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 Howell K-1

Analysis: Metals by Method 6010B, Dissolved
Method: SW6010B
WorkOrder: 09120826
Lab Batch ID: 96595

Method Blank

RunID: ICP2_091229B-5347848 Units: mg/L
Analysis Date: 12/29/2009 21:37 Analyst: AB1
Preparation Date: 12/20/2009 17:30 Prep By: M_ Method SW3005A

Analyte	Result	Rep Limit
Iron	ND	0.02
Manganese	ND	0.005

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09120826-01B	MW-1
09120826-02B	MW-2
09120826-03B	MW-3
09120826-04B	MW-4

Laboratory Control Sample (LCS)

RunID: ICP2_091229B-5347849 Units: mg/L
Analysis Date: 12/29/2009 21:41 Analyst: AB1
Preparation Date: 12/20/2009 17:30 Prep By: M_ Method SW3005A

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Iron	1.000	1.057	105.7	80	120
Manganese	1.000	1.073	107.3	80	120

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

Sample Spiked: 09120826-01
RunID: ICP2_091229B-5347851 Units: mg/L
Analysis Date: 12/29/2009 21:51 Analyst: AB1
Preparation Date: 12/20/2009 17:30 Prep By: M_ 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	1.773	1	2.733	96.00	1	2.695	92.20	1.400	20	75	125
Manganese	16.47	1	17.05	N/C	1	16.99	N/C	N/C	20	75	125

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

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

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

Quality Control Report

Conoco Phillips

COP Howell K-1

Analysis: Volatile Organics by Method 8260B
Method: SW8260B
WorkOrder: 09120826
Lab Batch ID: R292280

Method Blank

RunID: K_091224B-5343862 Units: ug/L
Analysis Date: 12/25/2009 8:27 Analyst: LU_L

Analyte	Result	Rep Limit
Benzene	ND	1.0
Ethylbenzene	ND	1.0
Toluene	ND	1.0
m,p-Xylene	ND	1.0
o-Xylene	ND	1.0
Xylenes,Total	ND	1.0
Surr: 1,2-Dichloroethane-d4	100.3	70-130
Surr: 4-Bromofluorobenzene	103.4	74-125
Surr: Toluene-d8	101.6	82-118

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09120826-01A	MW-1
09120826-02A	MW-2
09120826-03A	MW-3
09120826-04A	MW-4
09120826-05A	Duplicate
09120826-06A	Trip Blank

Laboratory Control Sample (LCS)

RunID: K_091224B-5343861 Units: ug/L
Analysis Date: 12/25/2009 7:55 Analyst: LU_L

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Benzene	20.0	21.7	109	74	123
Ethylbenzene	20.0	19.2	95.9	72	127
Toluene	20.0	19.3	96.7	74	126
m,p-Xylene	40.0	39.2	98.0	71	129
o-Xylene	20.0	19.4	96.9	74	130
Xylenes,Total	60.0	58.6	97.7	71	130
Surr: 1,2-Dichloroethane-d4	50.0	52.6	105	70	130
Surr: 4-Bromofluorobenzene	50.0	50.9	102	74	125
Surr: Toluene-d8	50.0	50.2	100	82	118

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

Sample Spiked: 09120826-05
RunID: K_091224B-5343865 Units: ug/L
Analysis Date: 12/25/2009 10:00 Analyst: LU_L

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

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

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

Quality Control Report

Conoco Phillips

COP Howell K-1

Analysis: Volatile Organics by Method 8260B **WorkOrder:** 09120826
Method: SW8260B **Lab Batch ID:** R292280

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit
Benzene	ND	20	21.1	105	20	21.3	107	1.18	22	70	124
Ethylbenzene	ND	20	17.6	88.2	20	18.2	91.2	3.37	20	76	122
Toluene	ND	20	19.0	94.8	20	18.9	94.4	0.418	24	80	117
m,p-Xylene	ND	40	35.6	89.1	40	37.0	92.4	3.70	20	69	127
o-Xylene	ND	20	18.9	94.6	20	19.0	95.1	0.575	20	84	114
Xylenes,Total	ND	60	54.5	90.9	60	56.0	93.3	2.63	20	69	127
Surr: 1,2-Dichloroethane-d4	ND	50	51.7	103	50	53.4	107	3.19	30	70	130
Surr: 4-Bromofluorobenzene	ND	50	50.6	101	50	51.5	103	1.91	30	74	125
Surr: Toluene-d8	ND	50	49.2	98.3	50	49.3	98.6	0.262	30	82	118

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

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

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

Quality Control Report

Conoco Phillips

COP Howell K-1

Analysis: Ion Chromatography
Method: E300.0

WorkOrder: 09120826
Lab Batch ID: R292452

Method Blank

RunID: IC2_091227C-5347265 Units: mg/L
Analysis Date: 12/28/2009 5:35 Analyst: BDG

Analyte	Result	Rep Limit
Fluoride	ND	0.50

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09120826-01C	MW-1
09120826-02C	MW-2
09120826-03C	MW-3
09120826-04C	MW-4

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

RunID: IC2_091227C-5347266 Units: mg/L
Analysis Date: 12/28/2009 5:52 Analyst: BDG

Analyte	LCS Spike Added	LCS Result	LCS Percent Recovery	LCSD Spike Added	LCSD Result	LCSD Percent Recovery	RPD	RPD Limit	Lower Limit	Upper Limit
Fluoride	10.00	10.63	106.3	10.00	9.948	99.48	6.6	20	85	115

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

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Quality Control Report

Conoco Phillips

COP Howell K-1

Analysis: Ion Chromatography
Method: E300.0

WorkOrder: 09120826
Lab Batch ID: R292454

Method Blank

RunID: IC1_091229A-5347339 Units: mg/L
Analysis Date: 12/29/2009 13:17 Analyst: BDG

Analyte	Result	Rep Limit
Sulfate	ND	0.50

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09120826-01C	MW-1
09120826-02C	MW-2
09120826-04C	MW-4

Laboratory Control Sample (LCS)

RunID: IC1_091229A-5347340 Units: mg/L
Analysis Date: 12/29/2009 13:33 Analyst: BDG

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Sulfate	10.00	10.19	101.9	85	115

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

Sample Spiked: 09121055-01
RunID: IC1_091229A-5347358 Units: mg/L
Analysis Date: 12/30/2009 1:06 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	ND	10	10.66	106.5	10	11.34	113.4	6.237	20	80	120

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

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

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HOUSTON, TX 77054
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Quality Control Report

Conoco Phillips

COP Howell K-1

Analysis: Ion Chromatography
Method: E300.0

WorkOrder: 09120826
Lab Batch ID: R292548

Method Blank

RunID: IC1_091229D-5348982 Units: mg/L
Analysis Date: 12/30/2009 1:38 Analyst: BDG

Samples in Analytical Batch:

Lab Sample ID	Client Sample ID
09120826-03C	MW-3

Analyte	Result	Rep Limit
Sulfate	ND	0.50

Laboratory Control Sample (LCS)

RunID: IC1_091229D-5348983 Units: mg/L
Analysis Date: 12/30/2009 1:55 Analyst: BDG

Analyte	Spike Added	Result	Percent Recovery	Lower Limit	Upper Limit
Sulfate	10.00	10.67	106.7	85	115

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

Sample Spiked: 09121051-06
RunID: IC1_091229D-5349008 Units: mg/L
Analysis Date: 12/30/2009 13:17 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	11.64	10	29.92	182.9 *	10	30.82	191.8 *	2.944	20	80	120

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

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

Sample Receipt Checklist

And

Chain of Custody

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

Sample Receipt Checklist

Workorder:	09120826	Received By:	RE
Date and Time Received:	12/19/2009 9:45:00 AM	Carrier name:	Fedex-Priority
Temperature:	1.2°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.: 0912082G

292847

page 1 of 1

Client Name: Tetra Tech
Address: 6121 Indian School Rd NE Suite 700
City: Albuquerque State: NM Zip:
Phone/Fax: 505-237-8440
Client Contact: Kelly Blanchard Email: Kelly.blanchard@tetratech.com
Project Name/No.: Howell K1
Site Name:
Site Location: San Juan County, NM
Invoice To: Conoco Phillips 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	Dissolved Fe, Manganese	Fluoride, Sulfate
MW-1	12/15/09	1455		X	W	V	40	1	3	X		
MW-2	12/15/09	1440		X	W	V	40	1	3	X		
MW-3	12/15/09	1410		X	W	V	40	1	3	X		
MW-4	12/15/09	1340		X	W	V	40	1	3	X		
Duplicate	12/15/09	1510		X	W	V	40	1	3	X		
Trip Blank	12/7/09	1130		X	W	V	40	1	2	X		
MW-1	12/15/09	1455		X	W	P	16	X	2		X	X
MW-2	12/15/09	1440		X	W	P	16	X	2		X	X
MW-3	12/15/09	1410		X	W	P	16	X	2		X	X
MW-4	12/15/09	1340		X	W	P	16	X	2		X	X

Client/Consultant Remarks:

Laboratory remarks:

Intact? Y N
Ice? Y N
Temp: 1.2c

Requested TAT
- 1 Business Day
- 2 Business Days
- 3 Business Days
- Contract
- Standard
- Other
- 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):

	date	time	
1. Relinquished by Sampler:	12/17/09	1200	2. Received by:
3. Relinquished by:	date:	time	4. Received by:
5. Relinquished by:	12/19/09	0945	6. Received by Laboratory:

8880 Interchange Drive
Houston, TX 77054 (713) 660-0901

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Scott, LA 70583 (337) 237-4775

459 Hughes Drive
Traverse City, MI 49686 (231) 947-5777