2017 Annual Groundwater Monitoring Report

Farmington B Com No. 1E
San Juan County, New Mexico
API# 30-045-24774
NMOCD# 3R-084

Hilcorp Energy Company

GHD | 6121 Indian School Rd NE Suite 200 Albuquerque NM 87110 USA

11146003| Report No 1 |January 31, 2018

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1. Introduction

This report summarizes the results of quarterly groundwater monitoring completed by GHD Services, Inc. (GHD) during 2017 at the Farmington B Com No. 1E site (Site). The Site is located on private property near the corner of East Murray Drive and South Carlton Avenue in southeast Farmington, New Mexico. Geographical coordinates for the Site are 36.721137° North and 108.190501° West. The Site consists of a natural gas well and associated equipment. The location and general features of the Site are presented as Figures 1 and 2, respectively. A generalized geological cross section of the Site is included as Figure 3.

1.1 Background

Conoco Inc., predecessor to ConocoPhillips Company (ConocoPhillips), owned the property and operated the gas well between July 1991 and January 1997. Merrion Oil & Gas Company is the current property owner and well operator. Site environmental responsibility transferred to Hilcorp Energy Company as part of sale of all San Juan Basin assets by ConocoPhillips in April 2017. A Phase II Environmental Site Assessment associated with the property transfer was conducted by On Site Technologies, Limited (On Site) in March 1997. Soil hydrocarbon impacts were confirmed north of a production storage tank and west of a separator/dehydrator pit (Figure 2). Impacts were described by On Site as limited to a former unlined pit area with hydrocarbon migration primarily occurring vertically through the soil profile due to the porous and permeable subsurface soils. Lateral migration was considered minimal. Soil excavation of the two impacted areas occurred in September 1997. A total of 906 cubic yards of impacted soil were removed from the two excavation areas. Of the 906 cubic yards, 328 were transported offsite and 578 were screened and determined to be suitable for backfill and placed back into the excavated areas along with imported clean fill. During backfill activities, approximately 10 gallons of liquid fertilizer was sprayed into both excavations to enhance in situ degradation of residual hydrocarbons.

Groundwater monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6 were installed at the Site in February and August 1998 under the supervision of On Site. During 1998 and 1999, results from groundwater samples collected from MW-2 through MW-6 did not have benzene, toluene, ethylbenzene, and xylenes (BTEX) concentrations in excess of New Mexico Water Quality Control Commission (NMWQCC) groundwater quality standards. On Site then requested that groundwater quality monitoring in wells MW-2 through MW-6 be discontinued. The request was approved by the New Mexico Energy, Minerals, and Natural Resources Department in a letter to Ms. Shirley Ebert of Conoco Inc.

Although monitoring wells MW-2 through MW-6 showed no hydrocarbon impacts during 1998 and 1999, light non aqueous phase liquid (LNAPL) had been observed in monitoring well MW-1 since its installation and recovery efforts occurred. Souder Miller and Associates (SMA) placed active and passive skimmers in MW-1 in May 2004.

The passive skimmer collected a small amount of LNAPL; the active skimmer did not collect any LNAPL. SMA determined that an active skimmer was not a viable method of LNAPL recovery in MW-1 and proposed passive skimming or periodic hand bailing.

Tetra Tech, Inc. (Tetra Tech) began groundwater quality monitoring at the Site in May 2005. Tetra Tech monitored MW-1 and MW-6, which is located down gradient of MW-1. Quarterly groundwater pumping events were conducted at MW-1 from October 2004 to March 2008. Pumping events were completed using a vacuum truck.

On June 15, 2011, Site consulting responsibilities were transferred from Tetra Tech to GHD of Albuquerque, NM. Quarterly groundwater sampling of MW-1 and MW-6 was continued by GHD. After 12 consecutive quarters of sampling with BTEX constituents below NMWQCC standards, BTEX analysis was discontinued following the December 2011 sampling event and annual sampling for dissolved iron and dissolved manganese only, the two remaining constituents of concern above standards, was initiated.

Two injection wells, TW-1 and TW-2, were drilled and installed east and west of monitor well MW-1 to aid in in-situ chemical oxidation (ISCO) injections. The ISCO remedial approach included injecting a catalyzed sodium persulfate solution into these wells and into MW-1 in November 2014, in March 2015 and again during October 2016 to address elevated dissolved manganese and iron in groundwater. A summary of the Farmington B Com No. 1E Site history is presented in Table 1.

2. Groundwater Monitoring Summary

Quarterly groundwater sampling was conducted by GHD on March 6, June 12, October 27 and December 6 of 2017. Groundwater elevation measurements were recorded for monitoring wells MW-1 through MW-6 using an oil/water interface probe and are presented in Table 2. Groundwater flows to the west-southwest, consistent with historical monitoring data for this Site. An irrigation canal is located immediately south of the Site, comprising a portion of its southern boundary. The Animas River is approximately ¾ miles northwest of the Site and flows west. Flow in both of these surface water features likely affects seasonal groundwater elevations and flow direction as measured in Site monitoring wells. Groundwater potentiometric surface maps generated for each quarterly monitoring event are presented as Figures 4 through 7.

2.1 Groundwater Monitoring Methodology

Site monitor wells MW-1, MW-3 and MW-6 were sampled during 2017. Prior to sample collection, wells were purged of at least three well volumes with a dedicated polyethylene 1.5 inch disposable bailer. During purging, field parameters including pH, conductivity, dissolved oxygen, temperature and oxidation/reduction potential were measured periodically and recorded on field sampling forms. Field parameters are summarized in Table 3. Collected groundwater samples were placed in laboratory prepared bottles, packed on ice, and shipped under chain of custody documentation to Pace Analytical Services, Inc. of Lenexa, Kansas. The samples were analyzed for the presence of dissolved iron and manganese according to EPA Method 6010 and for sulfates via EPA Method 300.

2.2 Groundwater Monitoring Analytical Results

The NMWQCC regulates groundwater quality in New Mexico under 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 above NMWQCC standards during the 2017 sampling events are discussed below:

- Dissolved Manganese
  - The NMWQCC groundwater standard for dissolved manganese is 0.2 milligrams per liter (mg/L). Concentrations of dissolved manganese exceeded the standard in monitor well MW-1 during all quarters except June (range 0.839 -1.15 mg/L); in MW-3 for the March quarter (0.211 mg/L) and in MW-6 for the March, October and December quarters (range 0.218-0.428 mg/L).
- Dissolved Iron
  - The NMWQCC groundwater standard for dissolved iron is 1.0 mg/L. Groundwater collected from monitor wells MW-1 exceeded the standard during the October and December quarters (range 4.89-6.69 mg/L).
- Sulfate
  - The NMWQCC groundwater standard for sulfate is 600 mg/L. Groundwater collected from monitor wells MW-1 exceeded the standard during the June sampling event with a concentration of 2420 mg/L.

Laboratory analytical results are summarized in Table 4. Laboratory analytical reports for 2017 groundwater monitoring are included in Appendix A.

3. Conclusions and Recommendations

ISCO treatment is expected to create oxidizing conditions that would cause the oxidation and precipitation of iron and manganese since these metals are more soluble in their reduced forms. The metals also have lower solubilities at higher pH.

In the MW-1 area, there are some indications that fluctuating water levels may be causing some of the increases in iron and manganese that were observed, with high iron levels in particular corresponding to very low or very high water levels. The fluctuations may be solubilizing iron from the aquifer matrix. However, the main predictor of metals levels appears to be pH. When the pH increases as a result of the ISCO injections, the metals concentrations are reduced. However, the buffering capacity of the aquifer appears to return the pH to baseline conditions within a year, and when the pH decreases, the concentration of dissolved iron and manganese in the groundwater increases. pH appears to be more critical than DO or ORP in determining the solubility of metals at this Site.

In the MW-6 area, the iron concentration appears to be naturally low and it is only the manganese concentration that is of concern. Some of the increases in manganese concentrations coincide with low groundwater levels; however, again, pH is the main predictor of manganese concentrations. As with the MW-1 area, the buffering capacity of the aquifer appears to cause the pH to return to baseline levels within a year, and this causes manganese concentrations to increase.

Since the concentrations of dissolved iron and manganese at the Site is so strongly related to pH and weakly related to DO and ORP, the use of caustic only, without the oxidant is recommended for future injection events. Since the caustic would have a lower cost, it may be possible to inject a larger volume of dilute solution.

Continued quarterly groundwater monitoring events are also recommended for 2018. The next groundwater monitoring event is scheduled for March 2018.

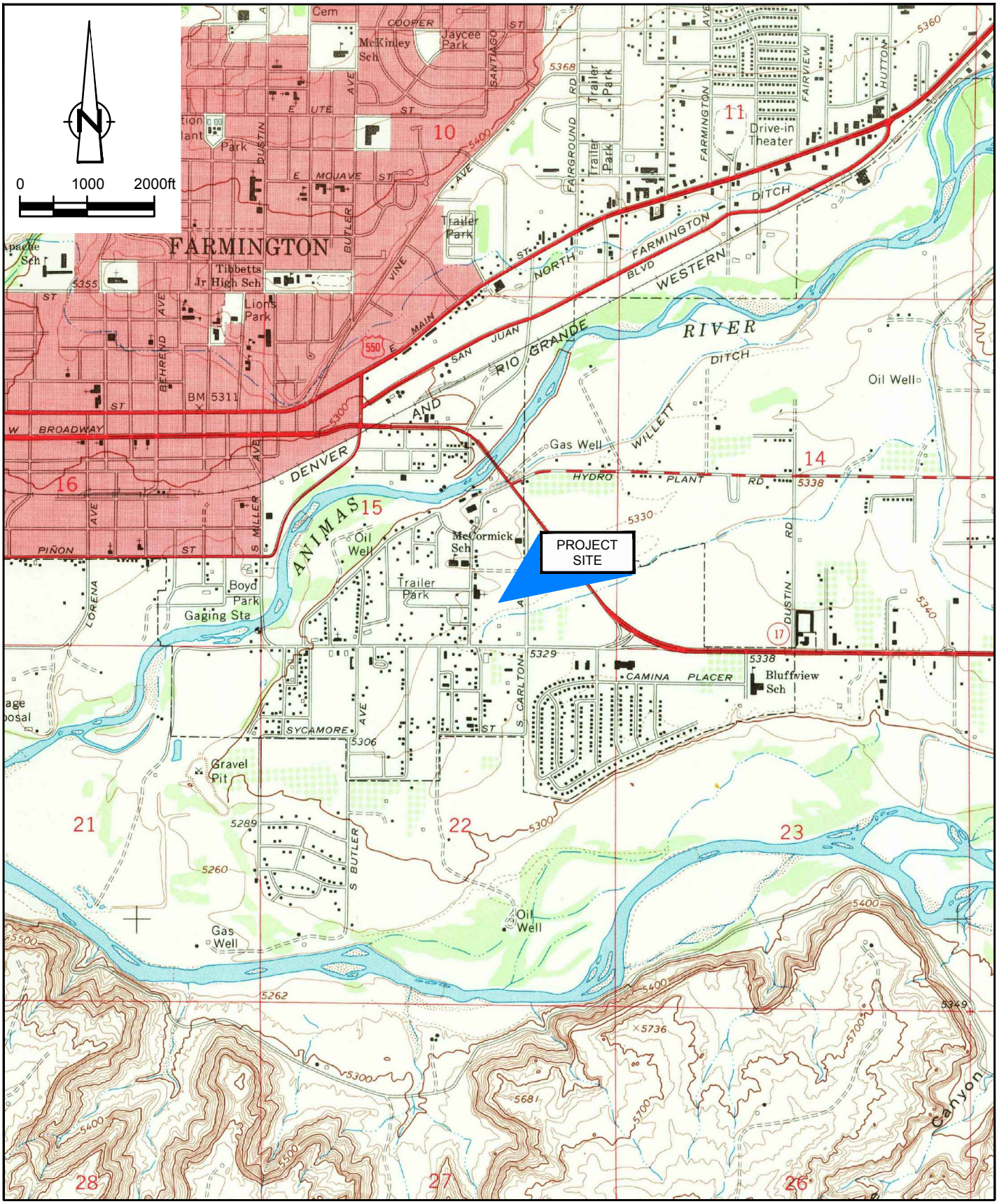
Respectfully Submitted,

GHD

Jeff Walker
Senior Project Manager

Bernard Bockisch
Albuquerque Office Manager

Figures



Source: USGS 7.5 Minute Quad "Farmington, New Mexico"

HILCORP ENERGY COMPANY
FARMINGTON, NEW MEXICO
FARMINGTON B-COM No. 1E

11146003-00

Jan 3, 2018

SITE LOCATION MAP

FIGURE 1

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ConocoPhillips High Resolution Aerial Imagery

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HILCORP ENERGY COMPANY
FARMINGTON, NEW MEXICO
FARMINGTON B-COM No. 1E

11146003-00
Jan 31, 2018

SITE PLAN

FIGURE 2

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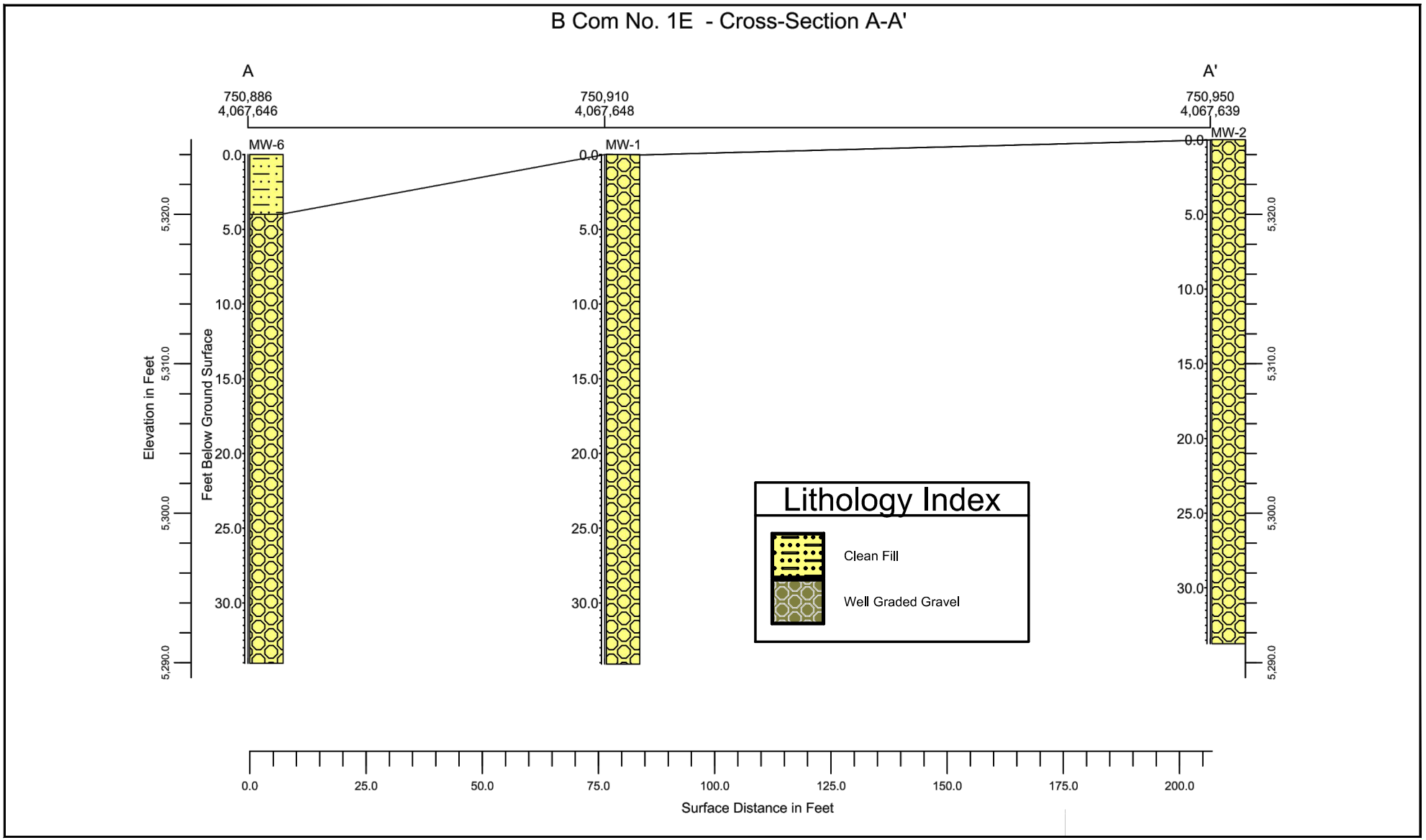

HILCORP ENERGY COMPANY
FARMINGTON, NEW MEXICO
FARMINGTON B-COM No. 1E

11146003-00

Jan 3, 2018

GENERALIZED GEOLOGIC CROSS SECTION

FIGURE 3

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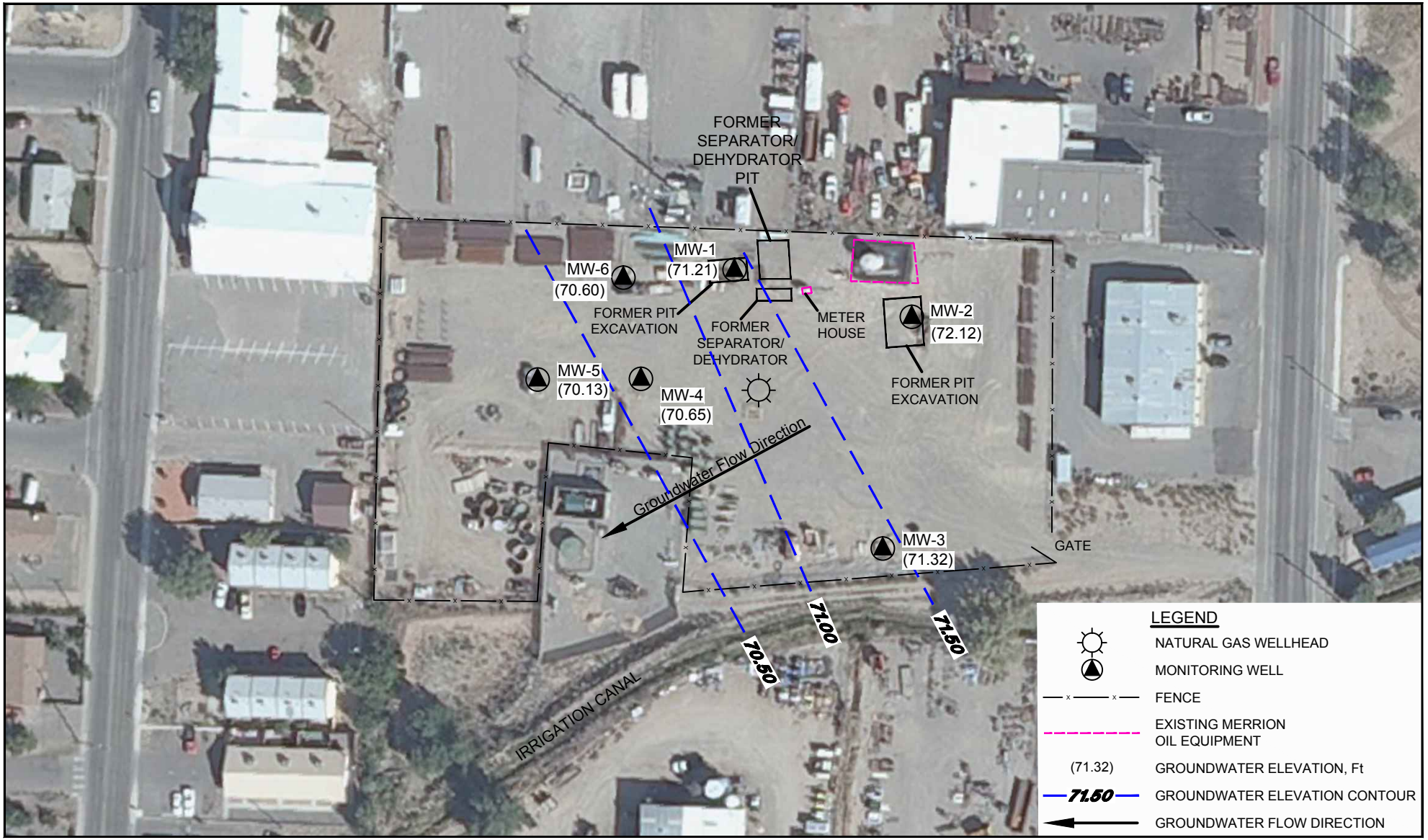

ConocoPhillips High Resolution Aerial Imagery

0 50 100ft

HILCORP ENERGY COMPANY
FARMINGTON, NEW MEXICO
FARMINGTON B-COM No. 1E

MARCH 2017
GROUNDWATER POTENTIOMETRIC SURFACE MAP

11146003-00
Jan 31, 2018

FIGURE 4

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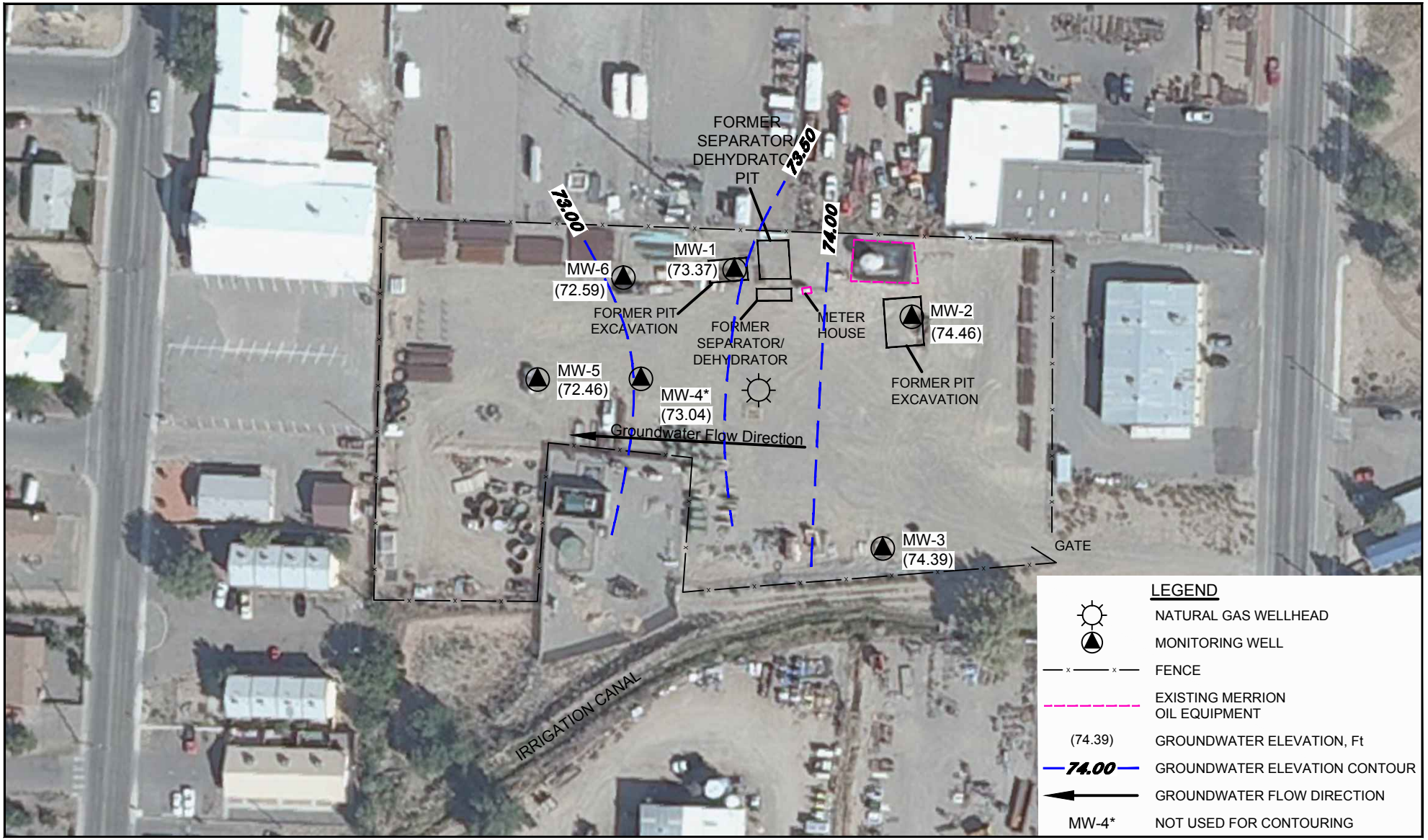

ConocoPhillips High Resolution Aerial Imagery

0 50 100ft

HILCORP ENERGY COMPANY
FARMINGTON, NEW MEXICO
FARMINGTON B-COM No. 1E

JUNE 2017
GROUNDWATER POTENTIOMETRIC SURFACE MAP

11146003-00
Jan 4, 2018

FIGURE 5

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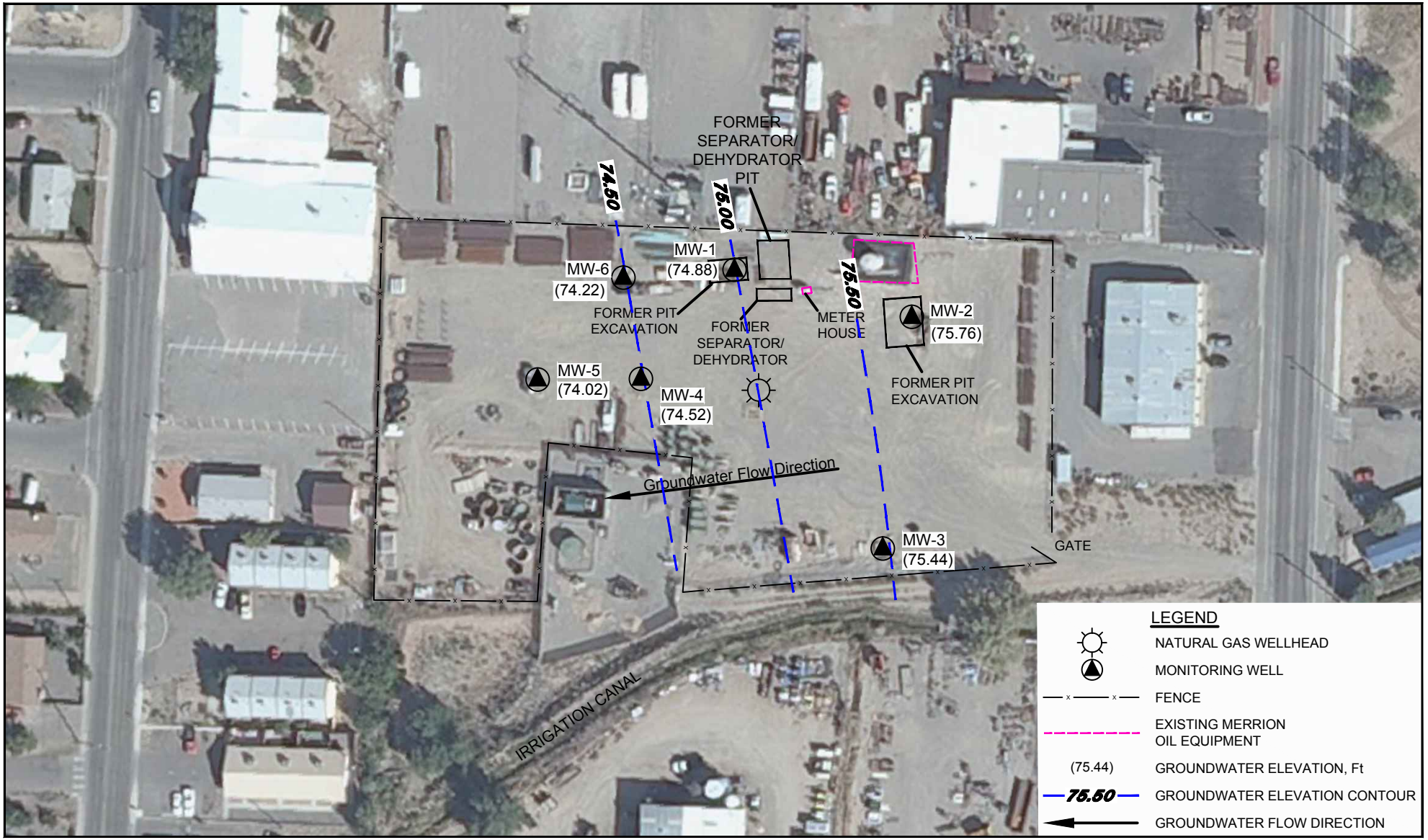

ConocoPhillips High Resolution Aerial Imagery

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HILCORP ENERGY COMPANY
FARMINGTON, NEW MEXICO
FARMINGTON B-COM No. 1E

OCTOBER 2017
GROUNDWATER POTENTIOMETRIC SURFACE MAP

11146003-00
Jan 3, 2018

FIGURE 6

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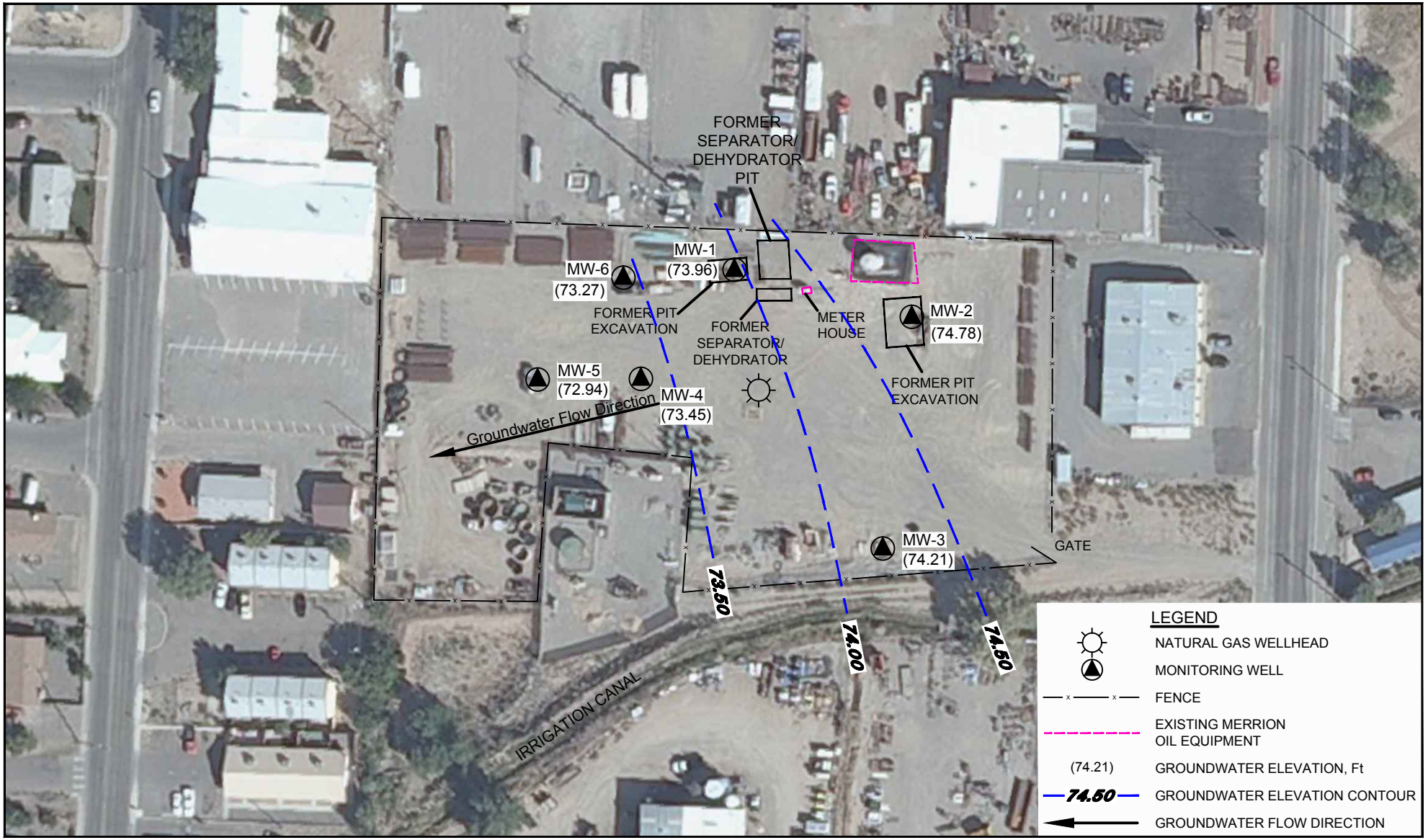

ConocoPhillips High Resolution Aerial Imagery

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HILCORP ENERGY COMPANY
FARMINGTON, NEW MEXICO
FARMINGTON B-COM No. 1E

DECEMBER 2017
GROUNDWATER POTENTIOMETRIC SURFACE MAP

11146003-00
Jan 4, 2018

FIGURE 7

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Tables

Table 1

Site History Timeline
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Date	*Event/Action*	*Activity*
February 18, 1982	Well Completed	Pioneer Production Corp. completed the Farmington B-COM No. 1E gas production well.
July 1, 1991	Conoco Inc. well purchase	Conoco Inc. purchases wellsite from Mesa Operating Limited Partnership of Amarillo, Texas.
January 1, 1997	Change of ownership	Conoco Inc. sold the property and mineral lease to Merrion Oil & Gas Co.
March, 1997	Site Assessment	Phase II Environmental Site Assessment is conducted by On Site Technologies.Three test holes advanced with Auger refusal encountered at 7 feet below ground surface (bgs) due to gravel and cobbles. No samples collected. On Site Technologies later excavates four additional test holes ranging in depth from 14 to 19 feet bgs. Soil samples are collected from each excavation. TPH and BTEX contamination is found in the vicinity of a former unlined pit.
September, 1997	Soil Excavation	On Site Technologies oversees soil excavation of two pits. 906 cubic yards of impacted soil were removed; of which 328 were disposed of offsite and 578 cubic yards were placed back in the pits along with clean fill. Approximately 10 gallons of liquid fertilizer was sprayed into each pit during backfill.
February and August 1998	Monitor Well Installation	Six monitor wells (MW-1 through MW-6) installed at the site under the supervision of On Site.
October 29, 2004	Groundwater Removal from Monitor Well MW-1	First removal of groundwater - 160 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
November 1, 2004	Groundwater Removal from Monitor Well MW-1	40 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
December 3, 2004	Groundwater Removal from Monitor Well MW-1	150 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
May 9th and 10th, 2005	Monitor Well Sampling	Tetra Tech begins quarterly monitoring at the site. Groundwater samples collected from monitor wells MW-1 and MW-6. A sheen is noted in MW-1; an oil absorbant sock is placed in the well.
July 6, 2005	Groundwater Removal from Monitor Well MW-1	138 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
October 19, 2005	Groundwater Removal from Monitor Well MW-1 and Monitor Well Sampling	Groundwater samples collected from monitor wells MW-1 and MW-6. 186 gallons removed from MW-1; a sheen is observed in purge water and oil absorbant sock is replaced.
February 16, 2006	Groundwater Removal from Monitor Well MW-1	144 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
May 15, 2006		152 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
August 2, 2006		457 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
November 14, 2006		423 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
November 14, 2006	Monitor Well Sampling	Third sampling of monitor wells MW-1 and MW-6 conducted by Tetra Tech.

Table 1

Site History Timeline
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Date	*Event/Action*	*Activity*
February 20, 2007	Groundwater Removal from Monitor Well MW-1	220 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
May 15, 2007		364 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
August 21, 2007		684 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
November 7, 2007		651 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
November 7, 2007	Monitor Well Sampling	Fourth sampling of monitor wells MW-1 and MW-6 conducted by Tetra Tech.
January 16, 2008	Groundwater Removal from Monitor Well MW-1	149 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
March 18, 2008	Groundwater Removal from Monitor Well MW-1	93 gallons removed by vacuum truck operated by Riley Industrial Services of Farmington, NM.
July 24, 2008	Monitor Well Sampling	Initiation of quarterly sampling for monitor wells MW-1 and MW-6.
October 22, 2008	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6.
January 21, 2009	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. MW-1 not sampled due to presence of free product. Oil absorbent sock placed in the well.
April 1, 2009	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. No free product detected in MW-1. First quarter of compliance for all BTEX constituents.
June 10, 2009	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. No free product detected in MW-1. Second quarter of compliance for all BTEX constituents.
October 1, 2009	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. No free product detected in MW-1. Third quarter of compliance for all BTEX constituents.
December 17, 2009	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. No free product detected in MW-1. Fourth quarter of compliance for all BTEX constituents.
March 29, 2010	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. A thin hydrocarbon sheen is detected in MW-1. Fifth quarter of compliance for all BTEX constituents.
June 11, 2010	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. A thin hydrocarbon sheen is detected in MW-1. Sixth quarter of compliance for all BTEX constituents.
September 24, 2010	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. A thin hydrocarbon sheen is detected in MW-1. Seventh quarter of compliance for all BTEX constituents.

Table 1

Site History Timeline
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Date	*Event/Action*	*Activity*
February 7, 2011	Monitor Well Sampling	Continuation of quarterly sampling for monitor wells MW-1 and MW-6. A thin hydrocarbon sheen is detected in MW-1. Eighth quarter of compliance with NMWQCC standards for BTEX; however, dissolved manganese concentrations in MW-1 and MW-6 were above standards.
March 18, 2011	Monitor Well Sampling	Continuation of quarterly groundwater sampling for monitor wells MW-1 and MW-6. Nineth quarter of compliance with NMWQCC standards for BTEX; however, dissolved manganese concentration in MW-1 was above standard.
June 15, 2011	Transfer of Site Consulting Responsibilities	Site consulting responsibilities were transferred from Tetra Tech of Albuquerque, NM to Conestoga-Rovers & Associates of Albuquerque, NM.
June 20, 2011	Monitor Well Sampling	Continuation of quarterly groundwater sampling for monitor wells MW-1 and MW-6. Tenth quarter of compliance with NMWQCC standards for BTEX; however, dissolved manganese concentration in both MW-1 and MW-6 were above standard. LNAPL sheen present in MW-1.
September 30, 2011	Monitor Well Sampling	Continuation of quarterly groundwater sampling for monitor wells MW-1 and MW-6. 11th quarter of compliance with NMWQCC standards for BTEX; however, dissolved manganese and dissolved iron concentrations were above standards in MW-1. LNAPL sheen present in MW-1.
December 15, 2011	Monitor Well Sampling	Continuation of quarterly groundwater sampling for monitor wells MW-1 and MW-6. 12th quarter of compliance with NMWQCC standards for BTEX; however, dissolved manganese and dissolved iron concentrations were above standards in MW-1 and dissolved manganese concentration was above standard in MW-6. LNAPL sheen present in MW-1.
September 21, 2012	Monitor Well Sampling	Analysis for BTEX discontinued. Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved manganese and dissolved iron. LNAPL sheen present in MW-1.
April 4, 2013	Monitor Well Sampling	Monitor Wells MW-1, MW-2, MW-3, MW-4, MW-5 and MW-6 sampled and analyzed for dissolved manganese and dissolved iron. LNAPL sheen present in MW-1.
September 30, 2013	Monitor Well Sampling	Monitor Wells MW-1, MW-2, MW-3, MW-4, MW-5 and MW-6 sampled and analyzed for dissolved manganese and dissolved iron. LNAPL sheen present in MW-1. Monitor Well MW-1 also sampled and analyzed for metals treatability study.
September 26, 2014	Monitor Well Sampling	Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved Mn, dissolved Fe, dissolved Na, Ca, Mg, Na, K, sulfate, and chloride. LNAPL sheen present in MW-1.
October 18, 2014	Well Installations	Installation of TMW-1 & TMW-2 via air-rotary casing hammer. These wells are for ISCO injections.
November 4-6, 2014	In-Situ Chemical Oxydation	Injection of 4,650 gallons catalyzed sodium persulfate into TMW-1 & TMW-2 and MW-1 to address concentrations of dissolved Fe & Mn.
December 28, 2014	Post ISCO Groundwater Sampling	Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved Mn, dissolved Fe, dissolved Na, total Mn, total Fe, and TPH.

Table 1

Site History Timeline
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Date	***Event/Action***	***Activity***
January 28, 2015	Post ISCO Groundwater Sampling	Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved Mn, dissolved Fe, dissolved Na, total Mn, and total Fe.
March 17-19, 2015	2nd ISCO Event	2nd Injection event. 5525 gal catalyzed sodium persulfate injected into MW-1, TMW-1 & TMW-2.
June 18, 2015	Post ISCO Groundwater Sampling	Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved Mn, dissolved Fe, dissolved Na, and sulfate.
September 23, 2015	Annual Groundwater Sampling	Monitor Wells MW-1 through MW-6 sampled and analyzed for dissolved Mn, dissolved Fe, dissolved Na, and sulfate.
December 3, 2015	Quarterly Groundwater Sampling	Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved Mn, dissolved Fe, dissolved Na, total Mn, total Fe and sulfate. Dissolved Mn concentration in MW-1 was above standard.
March 28, 2016	Quarterly Groundwater Sampling	Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved Mn. Dissolved Mn concentrations in MW-1 and MW-6 were above standard.
June 22, 2016	Quarterly Groundwater Sampling	Monitor Wells MW-1 and MW-6 sampled and analyzed for dissolved Fe and Mn. Dissolved Mn concentrations in MW-1 and MW-6 were above standard. Dissoved Fe was over in
September 7, 2019	Quarterly Groundwater Sampling	Monitor Wells MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6 sampled for dissolved Fe, dissolved Mn, and sulfate.
October 18-20, 2016	3rd ISCO Event	3rd Injection event. 8920 gal catalyzed sodium persulfate injected into MW-1, TMW-1 & TMW-2.
November 28, 2016	Quarterly Groundwater Sampling	Monitor Wells MW-3, MW-4, MW-5 and MW-6 sampled for dissolved Fe, dissolved Mn, and sulfate.
November 28, 2016	Quarterly Groundwater Sampling	Monitor Wells MW-3, MW-4, MW-5 and MW-6 sampled for dissolved Fe, dissolved Mn, and sulfate.
March 6, 2017	Quarterly Groundwater Sampling	Monitor Wells MW-1, MW-3 and MW-6 sampled for dissolved Fe, dissolved Mn, and sulfate.
April 13, 2017	Sale of San Juan Asset to Hilcorp Energy	Site sold as part of ConocoPhillips Company announced sale of San Juan Asset to Hilcorp Energy Company.
June 12, 2017	Quarterly Groundwater Sampling	Monitor Wells MW-1, MW-3 and MW-6 sampled for dissolved Fe, dissolved Mn, and sulfate.
October 27, 2017	Quarterly Groundwater Sampling	Monitor Wells MW-1, MW-3 and MW-6 sampled for dissolved Fe, dissolved Mn, and sulfate.
December 6, 2017	Quarterly Groundwater Sampling	Monitor Wells MW-1, MW-3 and MW-6 sampled for dissolved Fe, dissolved Mn, and sulfate.

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Total Depth (ft)	Surface Elevation*	Screen Interval (ft bgs)	Date Measured	Depth to Product (ft below TOC)	Depth to Groundwater (ft below TOC)	Relative Water Level*
MW-1	34.09	101.37	19.09 - 34.09	05/09/2005	Sheen	28.30	73.07
				07/06/2005	-	26.50	74.87
				10/19/2005	Sheen	25.12	76.25
				02/16/2006	-	28.23	73.14
				05/15/2006	-	27.02	74.35
				08/02/2006	-	24.37	77.00
				11/14/2006	Sheen	26.48	74.89
				02/20/2007	Sheen	29.03	72.34
				05/15/2007	-	26.97	74.40
				08/21/2007	Sheen	25.20	76.17
				11/07/2007	26.1	26.30	75.07
				01/16/2008	27.88	29.24	72.13
				03/18/2008	29.27	29.27	72.10
				07/24/2008	Sheen	25.73	75.64
				10/22/2008	Sheen	25.35	76.02
				01/21/2009	27.9	28.25	73.12
				04/01/2009	-	29.47	71.90
				06/10/2009	-	26.75	74.62
				10/01/2009	-	23.14	78.23
				12/17/2009	-	26.31	75.06
				03/29/2010	28.68	28.71	72.66
				06/11/2010	Sheen	25.98	75.39
				09/24/2010	Sheen	25.26	76.11
				02/07/2011	Sheen	28.83	72.54
				03/18/2011	29.71	29.73	71.64
				06/20/2011	Sheen	27.00	74.37
				09/30/2011	Sheen	24.32	77.05
				12/15/2011	Sheen	26.90	74.47
				09/21/2012	Sheen	24.52	76.85
				04/04/2013	Sheen	29.74	71.63
				09/30/2013	Sheen	24.92	76.45
				09/26/2014	Sheen	25.92	75.45
				12/18/2014	--	27.81	73.56
				01/28/2015	Sheen	28.87	72.50
				06/18/2015	-	27.33	74.04
				09/23/2015	-	26.52	74.85
				12/03/2015	-	27.85	73.52
				03/28/2016	-	30.13	71.24
				06/22/2016	-	29.53	71.84
				09/06/2016	-	26.71	74.66
				11/28/2016	-	27.85	73.52
				03/06/2017	--	30.16	71.21
				06/12/2017	--	28.00	73.37
				10/27/2017	--	26.49	74.88
				12/06/2017	--	27.41	73.96

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Total Depth (ft)	Surface Elevation*	Screen Interval (ft bgs)	Date Measured	Depth to Product (ft below TOC)	Depth to Groundwater (ft below TOC)	Relative Water Level*
MW-2	33.72	101.57	18.72 - 33.72	5/9/2005	-	27.28	74.29
				7/6/2005	-	25.52	76.05
				10/19/2005	-	24.30	77.27
				2/16/2006	-	27.38	74.19
				5/15/2006	-	25.62	75.95
				8/2/2006	-	23.51	78.06
				11/14/2006	-	26.08	75.49
				2/20/2007	-	28.13	73.44
				5/15/2007	-	25.86	75.71
				8/21/2007	-	24.45	77.12
				11/7/2007	-	25.31	76.26
				1/16/2008	-	27.27	74.30
				3/18/2008	-	28.68	72.89
				7/24/2008	-	24.77	76.80
				10/22/2008	-	24.55	77.02
				1/21/2009	-	27.23	74.34
				4/1/2009	-	28.76	72.81
				6/10/2009	-	25.76	75.81
				10/1/2009	-	22.22	79.35
				12/17/2009	-	25.62	75.95
				3/29/2010	-	27.96	73.61
				6/11/2010	-	24.99	76.58
				9/24/2010	-	24.54	77.03
				2/7/2011	-	28.22	73.35
				3/18/2011	-	29.14	72.43
				6/20/2011	-	26.20	75.37
				9/30/2011	-	23.51	78.06
				12/15/2011	-	26.22	75.35
				09/21/2012	-	23.81	77.76
				04/04/2013	-	29.16	72.41
				09/30/2013	-	24.29	77.28
				09/26/2014	-	25.18	76.39
				12/18/2014	-	27.18	74.39
				01/28/2015	-	NM	-
				06/18/2015	-	27.73	73.84
				09/23/2015	-	25.74	75.83
				12/03/2015	-	27.23	74.34
				03/28/2016	-	29.67	71.90
				06/22/2016	-	27.20	74.37
				09/06/2016	-	25.96	75.61
				11/28/2016	-	27.20	74.37
				03/06/2017	--	29.45	72.12
				06/12/2017	--	27.11	74.46
				10/27/2017	--	25.81	75.76
				12/06/2017	--	26.79	74.78

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Total Depth (ft)	Surface Elevation*	Screen Interval (ft bgs)	Date Measured	Depth to Product (ft below TOC)	Depth to Groundwater (ft below TOC)	Relative Water Level*
MW-3	32.44	102.1	17.44 - 32.44	5/9/2005	--	27.81	74.29
				7/6/2005	--	26.03	76.07
				10/19/2005	--	25.06	77.04
				2/16/2006	--	28.57	73.53
				5/15/2006	--	26.15	75.95
				8/2/2006	--	23.83	78.27
				11/14/2006	--	26.75	75.35
				2/20/2007	--	29.31	72.79
				5/15/2007	--	26.23	75.87
				8/21/2007	--	25.00	77.10
				11/7/2007	--	26.12	75.98
				1/16/2008	--	28.46	73.64
				3/18/2008	--	29.97	72.13
				7/24/2008	--	25.27	76.83
				10/22/2008	--	25.35	76.75
				1/21/2009	--	28.56	73.54
				4/1/2009	--	30.20	71.90
				6/10/2009	--	26.55	75.55
				10/1/2009	--	23.00	79.10
				12/17/2009	--	26.86	75.24
				3/29/2010	--	29.41	72.69
				6/11/2010	--	25.62	76.48
				9/24/2010	--	25.23	76.87
				2/7/2011	--	29.47	72.63
				3/18/2011	--	30.40	71.70
				6/20/2011	--	26.83	75.27
				9/30/2011	--	23.95	78.15
				12/15/2011	--	27.41	74.69
				09/21/2012	--	24.55	77.55
				04/04/2013	--	30.52	71.58
				09/30/2013	--	25.27	76.83
				09/26/2014	--	25.91	76.19
				12/18/2014	--	28.30	73.80
				01/28/2015	--	NM	-
				06/18/2015	--	27.53	74.57
				09/23/2015	--	26.33	75.77
				12/03/2015	--	28.33	73.77
				03/28/2016	--	30.99	71.11
				06/22/2016	--	27.88	74.22
				09/06/2016	--	26.66	75.44
				11/28/2016	--	28.32	73.78
				03/06/2017	--	30.78	71.32
				06/12/2017	--	27.71	74.39
				10/27/2017	--	26.66	75.44
				12/06/2017	--	27.89	74.21

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Total Depth (ft)	Surface Elevation*	Screen Interval (ft bgs)	Date Measured	Depth to Product (ft below TOC)	Depth to Groundwater (ft below TOC)	Relative Water Level*
MW-4	32.72	101.4	17.72 - 32.72	5/9/2005	--	28.73	72.67
				7/6/2005	--	26.66	74.74
				10/19/2005	--	25.62	75.78
				2/16/2006	--	28.91	72.49
				5/15/2006	--	26.86	74.54
				8/2/2006	--	24.59	76.81
				11/14/2006	--	27.02	74.38
				2/20/2007	--	29.61	71.79
				5/15/2007	--	27.25	74.15
				8/21/2007	--	25.56	75.84
				11/7/2007	--	26.50	74.90
				1/16/2008	--	28.55	72.85
				3/18/2008	--	29.99	71.41
				7/24/2008	--	26.02	75.38
				10/22/2008	--	25.84	75.56
				1/21/2009	--	28.69	72.71
				4/1/2009	--	30.22	71.18
				6/10/2009	--	27.31	74.09
				10/1/2009	--	23.80	77.60
				12/17/2009	--	27.07	74.33
				3/29/2010	--	29.51	71.89
				6/11/2010	--	26.43	74.97
				9/24/2010	--	25.70	75.70
				2/7/2011	--	29.49	71.91
				3/18/2011	--	30.38	71.02
				6/20/2011	--	27.34	74.06
				9/30/2011	--	24.68	76.72
				12/15/2011	--	27.58	73.82
				09/21/2012	--	25.01	76.39
				04/04/2013	--	30.46	70.94
				09/30/2013	--	25.55	75.85
				09/26/2014	--	26.27	75.13
				12/18/2014	--	28.38	73.02
				01/28/2015	--	NM	-
				06/18/2015	--	26.60	74.80
				09/23/2015	--	26.77	74.63
				12/03/2015	--	28.41	72.99
				03/28/2016	--	30.82	70.58
				06/22/2016	--	28.38	73.02
				09/06/2016	--	27.03	74.37
				11/28/2016	--	28.43	72.97
				03/06/2017	--	30.75	70.65
				06/12/2017	--	28.36	73.04
				10/27/2017	--	26.88	74.52
				12/06/2017	--	27.95	73.45

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Total Depth (ft)	Surface Elevation*	Screen Interval (ft bgs)	Date Measured	Depth to Product (ft below TOC)	Depth to Groundwater (ft below TOC)	Relative Water Level*
MW-5	34.09	100.52	19.09 - 34.09	5/9/2005	--	28.50	72.02
				7/6/2005	--	26.32	74.20
				10/19/2005	--	25.30	75.22
				2/16/2006	--	28.62	71.90
				5/15/2006	--	26.55	73.97
				8/2/2006	--	24.23	76.29
				11/14/2006	--	27.67	72.85
				2/20/2007	--	29.34	71.18
				5/15/2007	--	27.04	73.48
				8/21/2007	--	25.21	75.31
				11/7/2007	--	26.13	74.39
				1/16/2008	--	28.18	72.34
				3/18/2008	--	29.65	70.87
				7/24/2008	--	25.73	74.79
				10/22/2008	--	25.49	75.03
				1/21/2009	--	28.38	72.14
				4/1/2009	--	29.92	70.60
				6/10/2009	--	27.09	73.43
				10/1/2009	--	23.50	77.02
				12/17/2009	--	26.77	73.75
				3/29/2010	--	29.21	71.31
				6/11/2010	--	26.16	74.36
				9/24/2010	--	25.31	75.21
				2/7/2011	--	29.13	71.39
				3/18/2011	--	30.10	70.42
				6/20/2011	--	27.03	73.49
				9/30/2011	--	24.35	76.17
				12/15/2011	--	27.25	73.27
				09/21/2012	--	24.65	75.87
				04/04/2013	--	30.10	70.42
				09/30/2013	--	25.16	75.36
				09/26/2014	--	25.88	74.64
				12/18/2014	--	27.98	72.54
				01/28/2015	--	NM	-
				06/18/2015	--	NM	-
				09/23/2015	--	26.41	74.11
				12/03/2015	--	28.00	72.52
				03/28/2016	--	30.41	70.11
				06/22/2016	--	28.03	72.49
				09/06/2016	--	22.66	77.86
				11/28/2016	--	28.03	72.49
				03/06/2017	--	30.39	70.13
				06/12/2017	--	28.06	72.46
				10/27/2017	--	26.50	74.02
				12/06/2017	--	27.58	72.94

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Total Depth (ft)	Surface Elevation*	Screen Interval (ft bgs)	Date Measured	Depth to Product (ft below TOC)	Depth to Groundwater (ft below TOC)	Relative Water Level*
MW-6	34.02	102.14	19.02 - 34.02	5/9/2005	--	29.94	72.20
				7/6/2005	--	27.89	74.25
				10/19/2005	--	26.70	75.44
				2/16/2006	--	29.85	72.29
				5/15/2006	--	28.11	74.03
				8/2/2006	--	25.83	76.31
				11/14/2006	--	27.91	74.23
				2/20/2007	--	30.52	71.62
				5/15/2007	--	28.61	73.53
				8/21/2007	--	26.67	75.47
				11/7/2007	--	27.52	74.62
				1/16/2008	--	29.43	72.71
				3/18/2008	--	30.85	71.29
				7/24/2008	--	27.26	74.88
				10/22/2008	--	26.85	75.29
				1/21/2009	--	29.52	72.62
				4/1/2009	--	31.00	71.14
				6/10/2009	--	28.44	73.70
				10/1/2009	--	24.75	77.39
				12/17/2009	--	27.90	74.24
				3/29/2010	--	30.29	71.85
				6/11/2010	--	27.58	74.56
				9/24/2010	--	26.74	75.40
				2/7/2011	--	30.35	71.79
				3/18/2011	--	31.21	70.93
				6/20/2011	--	28.50	73.64
				9/30/2011	--	25.85	76.29
				12/15/2011	--	28.41	73.73
				09/21/2012	--	26.03	76.11
				04/04/2013	--	31.24	70.90
				09/30/2013	--	25.43	76.71
				09/26/2014	--	27.38	74.76
				12/18/2014	--	29.28	72.86
				01/28/2015	--	30.33	71.81
				06/18/2015	--	28.73	73.41
				09/23/2015	--	27.91	74.23
				12/03/2015	--	29.31	72.83
				03/28/2016	--	31.52	70.62
				06/22/2016	--	28.00	74.14
				09/06/2016	--	28.21	73.93
				11/28/2016	--	29.33	72.81
				03/06/2017	--	31.54	70.60
				06/12/2017	--	29.55	72.59
				10/27/2017	--	27.92	74.22
				12/06/2017	--	28.87	73.27

Notes:

1. bgs = feet below ground surface
2. ft = Feet
3. TOC = Top of casing
4. * Elevations relative to an arbitrary point set at 100 feet
5. NM = Not measured

Table 3

Field Parameters Summary
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	*Sample Date*	*Temperature (°C)*	*pH*	*TDS (g/L)*	*Conductivity (µS/cm)*	*DO (mg/L)*	*ORP (mV)*	*Volume (gallons)*
MW-1	9/26/2014	18.30	7.17	0.824	1268	1.60	-198.0	3.50
	9/26/2014	18.23	7.17	0.810	1245	0.98	-210.3	3.75
	9/26/2014	18.15	7.18	0.800	1231	1.01	-221.4	4.00
	12/18/2014	18.93	12.95	10.310	15860	25.02	-166.1	2.00
	12/18/2014	19.28	12.80	8.800	15732	23.02	-161.7	2.50
	12/18/2014	19.35	12.76	10.270	15765	24.24	-159.5	3.00
	1/28/2015	18.78	11.91	4.202	6495	10.54	-36.4	1.75
	1/28/2015	18.78	12.01	3.378	5192	10.11	-48.4	2.25
	1/28/2015	18.76	12.06	3.249	5014	9.89	-57.4	2.75
	6/18/2015	17.81	9.44	13.390	21782	1.34	42.0	3.25
	6/18/2015	17.37	9.52	14.140	21793	1.27	46.5	3.50
	6/18/2015	17.00	9.59	14.610	22480	1.41	51.7	3.75
	6/18/2015	16.88	9.62	14.640	22830	1.51	61.5	4.00
	6/18/2015	16.87	9.64	14.640	22516	2.07	63.3	4.25
	9/23/2015	17.97	7.90	3.224	4960	1.41	-127.6	2.50
	9/23/2015	17.86	7.97	3.126	4808	1.92	-122.7	3.00
	9/23/2015	17.82	8.10	3.013	4033	1.61	-120.3	3.50
	12/3/2015	17.42	7.98	1.404	2158	7.79	-144.8	1.25
	12/3/2015	18.03	7.93	1.344	2068	3.55	-191.4	1.75
	12/3/2015	17.97	7.92	1.311	2016	2.45	-200.0	2.25
	3/28/2016	18.35	7.35	0.800	1190	3.77	-101.0	2.00
	6/22/2016	16.70	7.30	--	2620	0.50	-176.1	2.25
	9/7/2016	17.54	6.65	2.083	3205	1.10	-127.8	3.50
	3/6/2017	15.98	8.72	1.564	2398	0.86	-247.1	2.00
	6/12/2017	15.98	7.76	3.880	5967	1.27	-103.8	2.75
	10/27/2017	18.65	7.22	0.783	1273	5.27	-125.9	3.75
	12/6/2017	17.04	6.92	2.783	1202	1.21	55.6	3.25
MW-2	9/23/2015	18.01	7.11	0.782	1204	2.86	0.9	3.50
	9/23/2015	18.05	7.06	0.790	1217	2.79	-1.4	4.00
	9/23/2015	18.06	7.01	0.798	1227	2.99	-2.8	4.50
	9/7/2016	17.45	6.95	0.703	1081	3.89	5.7	4.00
MW-3	9/23/2015	17.49	7.28	0.787	1211	9.40	-45.2	3.25
	9/23/2015	17.29	7.11	0.769	1182	4.40	-38.7	3.75
	9/7/2016	16.37	6.81	0.673	1035	3.54	17.5	3.50
	11/28/2016	16.68	7.92	--	1072	4.09	62.3	3.50
	3/6/2017	15.38	7.65	0.782	1202	3.26	-117.1	1.50
	6/12/2017	14.88	7.33	0.612	943	4.51	-95.6	3.00
	10/27/2017	17.27	7.37	--	800	6.11	35	3.75
	12/6/2017	16.08	7.01	0.596	918	3.42	-56.9	3

Table 3

Field Parameters Summary
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	*Sample Date*	*Temperature (°C)*	*pH*	*TDS (g/L)*	*Conductivity (µS/cm)*	*DO (mg/L)*	*ORP (mV)*	*Volume (gallons)*
MW-4	9/23/2015	17.73	7.52	0.411	632	10.50	-18.5	3.25
	9/23/2015	17.61	7.11	0.709	1091	2.90	-48.1	3.50
	9/7/2016	16.75	6.80	0.693	1066	3.59	14.9	2.50
	11/28/2016	16.93	7.32	--	1003	3.11	113.1	2.00
MW-5	9/23/2015	18.12	7.04	0.892	1373	6.29	-109.5	2.75
	9/23/2015	18.06	7.03	0.888	1366	6.41	-101.7	3.25
	9/23/2015	17.77	6.99	0.885	1362	6.16	-103.8	3.75
	9/7/2016	16.82	6.90	0.931	1433	6.49	41.1	4.50
	11/28/2016	17.58	7.37	--	1141	6.64	104.1	2.00
MW-6	9/26/2014	17.65	7.22	0.712	1096	1.38	-39.5	2.75
	9/26/2014	17.65	7.21	0.712	1096	1.39	-42.7	3.00
	9/26/2014	17.62	7.21	0.711	1094	1.29	-45.9	3.25
	12/18/2014	18.09	7.83	0.933	1436	2.61	-148.7	1.25
	12/18/2014	18.28	7.86	0.975	1500	1.95	-158.7	1.75
	12/18/2014	18.31	7.87	0.985	1515	1.99	-161.7	2.25
	1/28/2015	17.73	7.52	0.868	1335	4.17	-122.1	1.50
	1/28/2015	17.70	7.52	0.862	1326	3.08	-125.1	2.00
	1/28/2015	17.60	7.52	0.860	1323	2.84	-125.3	2.50
	6/18/2015	17.33	8.27	1.232	1895	5.75	-69.8	1.50
	6/18/2015	17.24	8.16	1.236	1901	2.28	-49.0	2.00
	6/18/2015	17.09	8.18	1.194	1836	1.81	-89.5	2.50
	9/23/2015	18.03	8.55	0.982	1511	3.46	-78.2	2.00
	9/23/2015	18.08	8.25	1.014	1560	2.56	-73.4	2.50
	9/23/2015	17.98	8.10	1.014	1559	2.45	-73.5	3.00
	12/3/2015	17.72	8.20	0.936	1441	4.02	-136.6	1.25
	12/3/2015	18.00	8.09	0.937	1441	2.63	-163.4	1.75
	12/3/2015	18.04	8.06	0.931	1433	4.07	-177.6	2.25
	3/28/2016	18.05	7.04	0.600	1000	5.16	-9.0	1.25
	6/22/2016	17.00	7.38	--	1060	1.63	1.8	3.00
	9/7/2016	16.94	7.03	0.777	1196	2.46	8.5	2.50
	11/28/2016	17.79	9.12	--	3150	3.50	115.9	2.00
	3/6/2017	15.90	7.42	0.810	1247	1.53	-160.6	1.50
	6/12/2017	15.22	7.42	0.763	1174	2.56	-116.3	2.00
	10/27/2017	17.98	7.21	--	1196	3.06	74.1	3
	12/6/2017	16.64	7.09	0.851	1307	2.53	-63.8	2.5
TMW-1	12/3/2015	17.12	8.23	2.072	3188	7.40	-205.6	--
TMW-2	12/3/2015	17054.00	9.40	5.043	7761	2.47	-231.2	--

Notes:

TDS = total dissolved solids
DO = dissolved oxygen
ORP = oxidation-reduction potential
-- = Data not recorded

°C = degrees Centigrade
mg/L = milligrams per liter
µS/cm = micro Siemens per centimeter
mV = millivolts

Table 4

Groundwater Laboratory Analytical Results Summary
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Sample ID	Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	TPH GRO (mg/L)	TPH DRO (mg/L)	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sodium (dissolved) (mg/L)	Iron (total) (mg/L)	Manganese (total) (mg/L)	Nitrate (as N) (mg/L)	Sulfate (mg/L)
NMWQCC Groundwater Quality Standards				0.01	0.75	0.75	0.62	NE	NE	1	0.2	NE	NE	NE	10	600
MW-1	MW-1	2/19/1998	(orig)	**0.21**	0.034	0.37	**2.044**	--	--	--	--	--	--	--	--	--
	MW-1	12/29/1998	(orig)	**0.35**	ND	0.42	**2.8**	--	--	--	--	--	--	--	--	--
	MW-1	5/9/2005	(orig)	**0.017**	< 0.0007	0.074	0.25	--	--	--	--	--	--	--	< 0.40	77.8
	MW-1	10/19/2005	(orig)	**0.034**	< 0.001	0.17	**1.4**	--	--	--	--	--	--	--	0.15	39.9
	MW-1	11/14/2006	(orig)	**0.018**	< 0.0007	0.19	**1.6**	--	--	--	--	--	--	--	< 0.015	145
	MW-1	11/7/2007	(orig)	0.007	< 0.0007	0.12	0.25	--	--	--	--	--	--	--	< 0.015	38.4
	MW-1	7/24/2008	(orig)	< 0.005	< 0.005	0.09	0.035	--	--	--	--	--	--	--	< 0.5	4.76
	MW-1 Duplicate	7/24/2008	(orig)	< 0.005	< 0.005	0.11	0.059	--	--	--	--	--	--	--	--	--
	MW-1	10/22/2008	(orig)	< 0.005	< 0.005	0.088	0.165	--	--	--	--	--	--	--	< 0.5	17
	MW-1 Duplicate	10/22/2008	(orig)	< 0.005	< 0.005	0.095	0.186	--	--	--	--	--	--	--	--	--
	MW-1	1/21/2009	Free Product - Not Sampled													
	MW-1	4/1/2009	(orig)	< 0.005	< 0.005	0.011	< 0.005	--	--	--	--	--	--	--	--	--
	MW-1	6/10/2009	(orig)	< 0.005	< 0.005	0.096	< 0.005	--	--	--	--	--	--	--	--	--
	MW-1	10/1/2009	(orig)	0.0013	< 0.001	0.058	0.142	--	--	0.233	--	--	--	--	--	--
	MW-1	12/17/2009	(orig)	0.0014	< 0.001	0.1	0.0028	--	--	0.521	--	--	--	--	--	--
	MW-1	3/29/2010	(orig)	< 0.001	< 0.001	0.051	< 0.001	--	--	0.0803	--	--	--	--	--	--
	MW-1	6/11/2010	(orig)	0.0011	< 0.001	0.098	0.0018	--	--	0.0217	--	--	--	--	--	--
	MW-1	9/24/2010	(orig)	< 0.001	< 0.001	0.092	0.0278	--	--	0.0285	--	--	--	--	--	--
	MW-1	2/7/2011	(orig)	< 0.001	< 0.001	0.026	< 0.001	--	--	--	**0.459**	--	--	--	--	--
	MW-1	3/18/2011	(orig)	< 0.001	< 0.001	0.01	< 0.001	--	--	< 0.02	**0.477**	--	--	--	--	--
	GW-BCOM-062011-CMB-002	6/20/2011	(orig)	< 0.0010	< 0.0010	0.0912	0.0018	--	--	0.157	**0.424**	--	--	--	--	--
	GW-BCOM-062011-CMB-003	6/20/2011	(Duplicate)	< 0.0010	< 0.0010	0.0952	< 0.0030	--	--	--	--	--	--	--	--	--
	GW-074938-093011-CM-005	9/30/2011	(orig)	< 0.001	< 0.001	0.058	0.0048	--	--	**4.1**	**0.268**	--	--	--	--	--
	GW-074938-093011-CM-006	9/30/2011	(Duplicate)	< 0.001	< 0.001	0.0618	0.0052	--	--	--	--	--	--	--	--	--
	GW-074938-121511-CB-MW-1	12/15/2011	(orig)	< 0.001	< 0.001	0.0848	0.0095	--	--	**1.91**	**0.35**	--	--	--	--	--
	GW-074938-121511-CB-DUP	12/15/2011	(Duplicate)	< 0.001	< 0.001	0.0807	0.0092	--	--	--	--	--	--	--	--	--
	GW-074938-092112-JP-MW-1	9/21/2012	(orig)	--	--	--	--	--	--	**2.9**	**0.27**	--	--	--	--	--
	GW-074938-040413-CM-MW-1	4/4/2013	(orig)	--	--	--	--	--	--	**1.8**	**0.47**	--	--	--	--	--
	GW-074938-093013-CM-MW-1	9/30/2013	(orig)	--	--	--	--	--	--	**1.7**	**0.29**	--	--	--	--	--
	GW-074938-092614-CM-MW-1	9/26/2014	(orig)	--	--	--	--	--	--	**2.3**	**0.34**	--	--	--	--	16.3
	--	11/5/2014	IN SITU CHEMICAL OXIDATION INJECTION EVENT													
	GW-074938-121814-CM-MW-1	12/18/2014	(orig)	--	--	--	--	< 0.5	17.6	0.0805	< 0.005	1,280	139	0.844	--	**1,420**
	GW-074938-012815-JW-MW-1	1/28/2015	(orig)	--	--	--	--	--	--	< 0.050	< 0.005	333	3.92	0.0335	--	217
		3/17/2015	IN SITU CHEMICAL OXIDATION - 2nd INJECTION EVENT													
	GW-074938-061815-CB-MW-1	6/18/2015	(orig)	--	--	--	--	--	--	< 0.5	< 0.05	5,560	--	--	--	**8,230**
	GW-074938-061815-CB-DUP	6/18/2015	(Duplicate)	--	--	--	--	--	--	< 0.5	< 0.05	5,800	--	--	--	--
	GW-074938-092315-CB-MW-1	9/23/2015	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	970	--	--	--	**1370**
	GW-074938-092315-CB-DUP	9/23/2015	(Duplicate)	--	--	--	--	--	--	< 0.05	< 0.005	989	--	--	--	--
	GW-074938-12315-CB-MW-1	12/3/2015	(orig)	--	--	--	--	--	--	0.678	**0.568**	264	9.27	0.671	--	300
	GW-074938-12315-CB-DUP	12/3/2015	(Duplicate)	--	--	--	--	--	--	0.776	**0.597**	265	--	--	--	--
	GW-074938-032816-CM-MW-1	3/28/2016	(orig)	--	--	--	--	--	--	--	**0.454**	--	--	--	--	--
	GW-074938-032816-CM-DUP	3/28/2016	(Duplicate)	--	--	--	--	--	--	--	**0.445**	--	--	--	--	--
	GW-074938-062216-SP-MW-1	6/22/2016	(orig)	--	--	--	--	--	--	**16.2***	**1.72***	--	--	--	--	--
	GW-074938-090716-SP-MW-1	9/7/2016	(orig)	--	--	--	--	--	--	**7.66***	**1.63**	--	--	--	--	**689**
	GW-074938-090716-SP-DUP	9/7/2016	(Duplicate)	--	--	--	--	--	--	**10.2***	**1.77**	--	--	--	--	**767**
		10/18/2016	IN SITU CHEMICAL OXIDATION - 3rd INJECTION EVENT													
	GW-074938-030617-CN-MW-1	3/6/2017	(orig)	--	--	--	--	--	--	<0.05	0.022	--	--	--	--	408
	GW-074938-061217-CN-MW-1	6/12/2017	(orig)	--	--	--	--	--	--	0.662	**0.839**	--	--	--	--	**2420**
	GW-11146003-102717-CM-MW-1	10/27/2017	(orig)	--	--	--	--	--	--	**6.69**	**1.15**	--	--	--	--	105
	GW-11146003-120617-SP-MW-1	12/06/2017	(orig)	--	--	--	--	--	--	**4.89**	**1.02**	--	--	--	--	44.9
MW-2	GW-074938-040413-CM-MW-2	4/4/2013	(orig)	--	--	--	--	--	--	< 0.05	0.046	--	--	--	--	--
	GW-074938-093013-CM-MW-2	9/30/2013	(orig)	--	--	--	--	--	--	< 0.05	0.0077	--	--	--	--	--
	GW-074938-092315-CB-MW-2	9/23/2015	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	213
	GW-074938-090716-SP-MW-2	9/7/2016	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	106
MW-3	GW-074938-121511-CB-MW-3	12/15/2011	(orig)	--	--	--	--	--	--	0.246	0.112	--	--	--	--	--
	GW-074938-040413-CM-MW-3	4/4/2013	(orig)	--	--	--	--	--	--	0.34	**0.28**	--	--	--	--	--
	GW-074938-093013-CM-MW-3	9/30/2013	(orig)	--	--	--	--	--	--	< 0.05	0.047	--	--	--	--	--
	GW-074938-092315-CB-MW-3	9/23/2015	(orig)	--	--	--	--	--	--	< 0.05	0.121	--	--	--	--	219
	GW-074938-090716-SP-MW-3	9/7/2016	(orig)	--	--	--	--	--	--	< 0.05	**0.85**	--	--	--	--	192
	GW-074938-112816-CN-MW-3	11/28/2016	(orig)	--	--	--	--	--	--	0.218	0.0959	--	--	--	--	214
	GW-074938-030617-CN-MW-3	3/6/2017	(orig)	--	--	--	--	--	--	0.149	**0.211**	--	--	--	--	116
	GW-074938-061217-CN-MW-3	6/12/2017	(orig)	--	--	--	--	--	--	0.0726	0.0604	--	--	--	--	102
	GW-11146003-102717-CM-MW-3	10/27/2017	(orig)	--	--	--	--	--	--	< 0.05	0.136	--	--	--	--	171
	GW-11146003-120617-SP-MW-3	12/06/2017	(orig)	--	--	--	--	--	--	< 0.05	0.0361	--	--	--	--	189

Table 4

Groundwater Laboratory Analytical Results Summary
Hilcorp Energy Company
Farmington B Com No. 1E
San Juan County, New Mexico

Well ID	Sample ID	Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	TPH GRO (mg/L)	TPH DRO (mg/L)	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sodium (dissolved) (mg/L)	Iron (total) (mg/L)	Manganese (total) (mg/L)	Nitrate (as N) (mg/L)	Sulfate (mg/L)
NMWQCC Groundwater Quality Standards				**0.01**	**0.75**	**0.75**	**0.62**	**NE**	**NE**	**1**	**0.2**	**NE**	**NE**	**NE**	**10**	**600**
MW-4	GW-074938-040413-CM-MW-4	4/4/2013	(orig)	--	--	--	--	--	--	< 0.05	0.069	--	--	--	--	--
	GW-074938-093013-CM-MW-4	9/30/2013	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	--
	GW-074938-092315-CB-MW-4	9/23/2015	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	86.8
	GW-074938-090716-SP-MW-4	9/7/2016	(orig)	--	--	--	--	--	--	< 0.05	0.0094	--	--	--	--	70.5
	GW-074938-112816-CN-MW-4	11/28/2016	(orig)	--	--	--	--	--	--	< 0.05	0.0066	--	--	--	--	112
MW-5	GW-074938-040413-CM-MW-5	4/4/2013	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	--
	GW-074938-040413-CM-DUP	4/4/2013	(Duplicate)	--	--	--	--	--	--	0.62*	0.025*	--	--	--	--	--
	GW-074938-093013-CM-MW-5	9/30/2013	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	--
	GW-074938-092315-CB-MW-5	9/23/2015	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	115
	GW-074938-090716-SP-MW-5	9/7/2016	(orig)	--	--	--	--	--	--	< 0.05	< 0.005	--	--	--	--	144
	GW-074938-112816-CN-MW-5	11/28/2016	(orig)	--	--	--	--	--	--	0.186	0.0083	--	--	--	--	155
MW-6	MW-6	9/15/1998	(orig)	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--
	MW-6	12/29/1998	(orig)	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--
	MW-6	3/3/1999	(orig)	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--
	MW-6	6/15/1999	(orig)	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--
	MW-6	9/15/1999	(orig)	ND	0.0007	0.0011	ND	--	--	--	--	--	--	--	--	--
	MW-6	12/14/1999	(orig)	ND	0.0018	0.0007	0.0019	--	--	--	--	--	--	--	--	--
	MW-6	1/22/2004	(orig)	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--
	MW-6	5/9/2005	(orig)	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--	--	--	--	--	--	--	< 0.4	97
	MW-6	10/19/2005	(orig)	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--	--	--	--	--	--	--	5.4	52.6
	MW-6	11/14/2006	(orig)	< 0.0005	< 0.0007	< 0.0008	0.001	--	--	--	--	--	--	--	< 0.015	159
	MW-6	11/7/2007	(orig)	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--	--	--	--	--	--	--	< 0.015	112
	MW-6	7/24/2008	(orig)	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--	--	--	--	< 0.5	44.4
	MW-6	10/22/2008	(orig)	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--	--	--	--	< 0.5	43.7
	MW-6	1/21/2009	(orig)	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--	--	--	--	< 0.5	31.1
	MW-6	4/1/2009	(orig)	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--	--	--	--	--	--
	MW-6	6/10/2009	(orig)	< 0.005	< 0.005	< 0.005	< 0.005	--	--	--	--	--	--	--	--	--
	MW-6	10/1/2009	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	--	--	< 0.02	--	--	--	--	--	--
	MW-6	12/17/2009	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	--	--	0.0511	--	--	--	--	--	--
	MW-6	3/29/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	--	--	< 0.0200	--	--	--	--	--	--
	MW-6	6/11/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	--	--	< 0.0200	--	--	--	--	--	--
	MW-6	9/24/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	--	--	< 0.0200	--	--	--	--	--	--
	MW-6	2/7/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	--	--	--	**0.543**	--	--	--	--	--
	MW-6	3/18/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	--	--	< 0.02	0.0679	--	--	--	--	--
	GW-BCOM-062011-CMB-001	6/20/2011	(orig)	< 0.0010	< 0.0010	< 0.0010	< 0.0030	--	--	< 0.1	**0.43**	--	--	--	--	--
	GW-074938-093011-CM-004	9/30/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	< 0.05	0.0261	--	--	--	--	--
	GW-074938-121511-CB-MW-6	12/15/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	0.429	**1.06**	--	--	--	--	--
	GW-074938-092112-JP-MW-6	9/21/2012	(orig)	--	--	--	--	--	--	< 0.05	0.058	--	--	--	--	--
	GW-074938-092112-JP-DUP	9/21/2012	(Duplicate)	--	--	--	--	--	--	< 0.06	0.055	--	--	--	--	--
	GW-074938-040413-CM-MW-6	4/4/2013	(orig)	--	--	--	--	--	--	0.056	**0.33**	--	--	--	--	--
	GW-074938-093013-CM-MW-6	9/30/2013	(orig)	--	--	--	--	--	--	< 0.05	0.17	--	--	--	--	--
	GW-074938-093013-CM-DUP	9/30/2013	(Duplicate)	--	--	--	--	--	--	< 0.05	0.17	--	--	--	--	--
	GW-074938-092614-CM-MW-1	9/26/2014	(orig)	--	--	--	--	--	--	0.24	**0.44**	--	--	--	--	
	GW-074938-092614-CM-DUP	9/26/2014	(Duplicate)	--	--	--	--	--	--	0.27	**0.41**	--	--	--	--	--
	--	11/5/2014	IN SITU CHEMICAL OXIDATION INJECTION EVENT													
	GW-074938-121814-CM-MW-6	12/18/2014	(orig)	--	--	--	--	< 0.50	< 0.50	**1.33**	**0.268**	177	4.6	0.351	--	112
	GW-074938-121814-CM-MW-DUP	12/18/2014	(Duplicate)	--	--	--	--	--	--	**1.11**	**0.255**	166	--	--	--	112
	GW-074938-012815-JW-MW-6	1/28/2015	(orig)	--	--	--	--	--	--	< 0.05	**0.402**	93.5	13.9	0.0868	--	29.8
		3/17/2015	IN SITU CHEMICAL OXIDATION - 2nd INJECTION EVENT													
	GW-074938-061815-CB-MW-6	6/18/2015	(orig)	--	--	--	--	--	--	0.0636	**0.0225**	402	--	--	--	236
	GW-074938-092315-CB-MW-6	9/23/2015	(orig)	--	--	--	--	--	--	< 0.05	0.0152	342		--	--	238
	GW-074938-12315-CB-MW-6	12/3/2015	(orig)	--	--	--	--	--	--	0.0709	0.194	252	7.81	0.428	--	75.8
	GW-074938-032816-CM-MW-6	3/28/2016	(orig)	--	--	--	--	--	--	--	**0.456**	--	--	--	--	--
	GW-074938-062216-SP-MW-6	6/22/2016	(orig)	--	--	--	--	--	--	< 0.05	**0.463**	--	--	--	--	--
	GW-074938-090716-SP-MW-6	9/7/2016	(orig)	--	--	--	--	--	--	< 0.05	**0.409**	--	--	--	--	86.7
		10/18/2016	IN SITU CHEMICAL OXIDATION - 3rd INJECTION EVENT													
	GW-074938-112816-CN-MW-6	11/28/2016	(orig)	--	--	--	--	--	--	< 0.05	0.0051	--	--	--	--	**1130**
	GW-074938-030617-CN-MW-6	3/6/2017	(orig)	--	--	--	--	--	--	0.0598	**0.428**	--	--	--	--	142
	GW-074938-061217-CN-MW-6	6/12/2017	(orig)	--	--	--	--	--	--	0.0543	0.0618	--	--	--	--	145
	GW-11146003-102717-CM-MW-6	10/27/2017	(orig)	--	--	--	--	--	--	< 0.05	**0.218**	--	--	--	--	171
	GW-11146003-120617-SP-MW-6	12/06/2017	(orig)	--	--	--	--	--	--	< 0.05	**0.311**	--	--	--	--	176

Notes:

1. MW = monitoring well
2. NMWQCC = New Mexico Water Quality Control Commission
3. Constituents in **BOLD** are in excess of NMWQCC groundwater quality standards
4. mg/L = milligrams per liter (parts per million)
5. < 1.0 = Below laboratory detection limit of 1.0 mg/L
6. ND = Below laboratory detection limit
7. -- = not sampled
8. * = anomolous data
9. NE = not established

Appendix A
Groundwater Laboratory Analytical Reports

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

March 23, 2017

Christine Mathews
GHD Services, Inc.
6212 Indian School Rd. NE St2
Albuquerque, NM 87110

RE: Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Dear Christine Mathews:
Enclosed are the analytical results for sample(s) received by the laboratory on March 10, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Alice Spiller

Alice Spiller
alice.spiller@pacelabs.com
(913)563-1409
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,
Jeffrey Walker, GHD Services, Inc

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 15-016-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60239508001	**GW-074938-030617-CN-MW-1**	Water	03/06/17 16:21	03/10/17 09:10
60239508002	**GW-074938-030617-CN-MW-3**	Water	03/06/17 16:30	03/10/17 09:10
60239508003	**GW-074938-030617-CN-MW-6**	Water	03/06/17 16:35	03/10/17 09:10

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Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60239508001	**GW-074938-030617-CN-MW-1**	EPA 6010	SMW	2	PASI-K
		EPA 300.0	OL	1	PASI-K
60239508002	**GW-074938-030617-CN-MW-3**	EPA 6010	SMW, ZBM	2	PASI-K
		EPA 300.0	OL	1	PASI-K
60239508003	**GW-074938-030617-CN-MW-6**	EPA 6010	SMW, ZBM	2	PASI-K
		EPA 300.0	OL	1	PASI-K

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PROJECT NARRATIVE

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Method: **EPA 6010**
Description: 6010 MET ICP, Dissolved
Client: GHD Services_COP NM
Date: March 23, 2017

General Information:
3 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: GHD Services_COP NM
Date: March 23, 2017

General Information:
3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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(913)599-5665

ANALYTICAL RESULTS

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Sample: GW-074938-030617-CN-MW-1 **Lab ID: 60239508001** Collected: 03/06/17 16:21 Received: 03/10/17 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	50.0	1	03/14/17 13:00	03/20/17 13:43	7439-89-6	
Manganese, Dissolved	**22.7**	ug/L	5.0	1	03/14/17 13:00	03/20/17 13:43	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**408**	mg/L	50.0	50		03/22/17 16:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Sample: GW-074938-030617-CN-MW-3 **Lab ID: 60239508002** Collected: 03/06/17 16:30 Received: 03/10/17 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	**149**	ug/L	50.0	1	03/14/17 13:00	03/20/17 13:45	7439-89-6	
Manganese, Dissolved	**211**	ug/L	25.0	5	03/14/17 13:00	03/16/17 14:21	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**116**	mg/L	10.0	10		03/21/17 17:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Sample: GW-074938-030617-CN-MW-6 **Lab ID: 60239508003** Collected: 03/06/17 16:35 Received: 03/10/17 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	**59.8**	ug/L	50.0	1	03/14/17 13:00	03/20/17 13:48	7439-89-6	
Manganese, Dissolved	**428**	ug/L	25.0	5	03/14/17 13:00	03/16/17 14:23	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**142**	mg/L	10.0	10		03/21/17 18:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

QC Batch: 468661 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60239508001, 60239508002, 60239508003

METHOD BLANK: 1918472 Matrix: Water
Associated Lab Samples: 60239508001, 60239508002, 60239508003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	03/15/17 14:22	
Manganese, Dissolved	ug/L	ND	5.0	03/15/17 14:22	

LABORATORY CONTROL SAMPLE: 1918473

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	10100	101	80-120	
Manganese, Dissolved	ug/L	1000	993	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1918474 1918475

Parameter	Units	60239528001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	90.8	10000	10000	10500	10600	104	105	75-125	1	20	
Manganese, Dissolved	ug/L	962	1000	1000	2010	2090	104	113	75-125	4	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

QC Batch: 469570 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60239508002, 60239508003

METHOD BLANK: 1922296 Matrix: Water
Associated Lab Samples: 60239508002, 60239508003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	03/21/17 10:58	

LABORATORY CONTROL SAMPLE: 1922297

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1922298 1922299

Parameter	Units	60239455001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	102	100	100	212	213	111	111	80-120	0	15	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

QC Batch: 469680 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60239508001

METHOD BLANK: 1922585 Matrix: Water
Associated Lab Samples: 60239508001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	03/22/17 13:31	

LABORATORY CONTROL SAMPLE: 1922586

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1922587 1922588

Parameter	Units	60239495001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	1250	500	500	1780	1790	106	108	80-120	1	15	

MATRIX SPIKE SAMPLE: 1922589

Parameter	Units	60239495002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1350	500	1920	113	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 074938 COP B-COM No. 1E
Pace Project No.: 60239508

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60239508001	**GW-074938-030617-CN-MW-1**	EPA 3010	468661	EPA 6010	468741
60239508002	**GW-074938-030617-CN-MW-3**	EPA 3010	468661	EPA 6010	468741
60239508003	**GW-074938-030617-CN-MW-6**	EPA 3010	468661	EPA 6010	468741
60239508001	**GW-074938-030617-CN-MW-1**	EPA 300.0	469680		
60239508002	**GW-074938-030617-CN-MW-3**	EPA 300.0	469570		
60239508003	**GW-074938-030617-CN-MW-6**	EPA 300.0	469570		

Pace Analytical
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Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60239508

60239508

Client Name: GHD COP

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 7049 6660 1561 Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: CF +1.5 T-266 / CF +0.9 T-239 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 2.6 **Corr. Factor** CF +1.5 / (CF +0.9) **Corrected** 4.1

Date and initials of person examining contents: JG 3/10/17

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☒Yes ☐No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	
Cyanide water sample checks: ☒ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Alice Date: 03/13/17

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 1340	Start:
End: 1345	End:
Temp:	Temp:

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	GHD Services_COP NM	Report To:	Christine Mathews	Attention:	
Address:	6212 Indian School Rd. NE St2	Copy To:		Company Name:	
	Albuquerque, NM 87110			Address:	
Email:	christine.mathews@ghd.com	Purchase Order #:		Pace Quote:	
Phone:	505-884-0672 Fax:	Project Name:	074938 COP B-COM No. 1E	Pace Project Manager:	alice.spiller@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	8644, line 19

Regulatory Agency	
State / Location	NM

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Dissolved Metals-field filtered	Sulfate by 300.0	Residual Chlorine (Y/N)	60239508
1	GW-074938-030617-CN-MW-1	WT	G	3-6-17	1621				2										✓	✓		BP3U BP3F 001
2	GW-074938-030617-CN-MW-3	WT	G	3-6-17	1630				2										✓	✓		002
3	GW-074938-030617-CN-MW-6	WT	G	3-6-17	1635				2										✓	✓		003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Charles Nelson	3-9-17	1600		3/10/17	0910	4.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	Charles Nelson		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:		DATE Signed: 3-9-17				

Pace Analytical Services, LLC
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June 26, 2017

Christine Mathews
GHD Services, Inc.
6212 Indian School Rd. NE St2
Albuquerque, NM 87110

RE: Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Dear Christine Mathews:
Enclosed are the analytical results for sample(s) received by the laboratory on June 17, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Alice Spiller

Alice Spiller
alice.spiller@pacelabs.com
(913)563-1409
Project Manager

Enclosures

cc: Angela Bown, GHD Services, Inc,
Jeffrey Walker, GHD Services, Inc

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 15-016-0
Illinois Certification #: 003097
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212008A
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60246772001	**GW-074938-061217-CN-MW-1**	Water	06/12/17 17:36	06/17/17 08:30
60246772002	**GW-074938-061217-CN-MW-3**	Water	06/12/17 17:55	06/17/17 08:30
60246772003	**GW-074938-061217-CN-MW-6**	Water	06/12/17 18:15	06/17/17 08:30

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SAMPLE ANALYTE COUNT

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60246772001	**GW-074938-061217-CN-MW-1**	EPA 6010	SMW	2	PASI-K
		EPA 300.0	RAD	1	PASI-K
60246772002	**GW-074938-061217-CN-MW-3**	EPA 6010	SMW	2	PASI-K
		EPA 300.0	RAD	1	PASI-K
60246772003	**GW-074938-061217-CN-MW-6**	EPA 6010	SMW	2	PASI-K
		EPA 300.0	RAD	1	PASI-K

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PROJECT NARRATIVE

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Method: **EPA 6010**
Description: 6010 MET ICP, Dissolved
Client: GHD Services_COP NM
Date: June 26, 2017

General Information:
3 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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(913)599-5665

PROJECT NARRATIVE

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: GHD Services_COP NM
Date: June 26, 2017

General Information:
3 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Sample: GW-074938-061217-CN-MW-1 **Lab ID: 60246772001** Collected: 06/12/17 17:36 Received: 06/17/17 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	**662**	ug/L	50.0	1	06/23/17 16:10	06/26/17 11:28	7439-89-6	
Manganese, Dissolved	**839**	ug/L	5.0	1	06/23/17 16:10	06/26/17 11:28	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**2420**	mg/L	250	250		06/21/17 13:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Sample: GW-074938-061217-CN-MW-3 **Lab ID: 60246772002** Collected: 06/12/17 17:55 Received: 06/17/17 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	**72.6**	ug/L	50.0	1	06/23/17 16:10	06/26/17 11:42	7439-89-6	
Manganese, Dissolved	**60.4**	ug/L	5.0	1	06/23/17 16:10	06/26/17 11:42	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**102**	mg/L	10.0	10		06/21/17 01:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Sample: GW-074938-061217-CN-MW-6 **Lab ID: 60246772003** Collected: 06/12/17 18:15 Received: 06/17/17 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	**54.3**	ug/L	50.0	1	06/23/17 16:10	06/26/17 11:44	7439-89-6	
Manganese, Dissolved	**61.8**	ug/L	5.0	1	06/23/17 16:10	06/26/17 11:44	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**145**	mg/L	10.0	10		06/21/17 01:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

QC Batch: 482383 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60246772001, 60246772002, 60246772003

METHOD BLANK: 1975951 Matrix: Water
Associated Lab Samples: 60246772001, 60246772002, 60246772003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	06/26/17 11:09	
Manganese, Dissolved	ug/L	ND	5.0	06/26/17 11:09	

LABORATORY CONTROL SAMPLE: 1975952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	9820	98	80-120	
Manganese, Dissolved	ug/L	1000	984	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1975953 1975954

Parameter	Units	60246772001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	662	10000	10000	10100	10200	94	95	75-125	1	20	
Manganese, Dissolved	ug/L	839	1000	1000	1770	1780	93	94	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

QC Batch: 481783 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60246772002, 60246772003

METHOD BLANK: 1973644 Matrix: Water
Associated Lab Samples: 60246772002, 60246772003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	06/20/17 20:39	

LABORATORY CONTROL SAMPLE: 1973645

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.6	93	90-110	

MATRIX SPIKE SAMPLE: 1973648

Parameter	Units	60246806004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	65.2	50	116	102	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

QC Batch: 481959
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60246772001

METHOD BLANK: 1974118
Matrix: Water
Associated Lab Samples: 60246772001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	06/21/17 08:25	

LABORATORY CONTROL SAMPLE: 1974119

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	101	90-110	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 074938 COP B-COM NO 1E
Pace Project No.: 60246772

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60246772001	**GW-074938-061217-CN-MW-1**	EPA 3010	482383	EPA 6010	482480
60246772002	**GW-074938-061217-CN-MW-3**	EPA 3010	482383	EPA 6010	482480
60246772003	**GW-074938-061217-CN-MW-6**	EPA 3010	482383	EPA 6010	482480
60246772001	**GW-074938-061217-CN-MW-1**	EPA 300.0	481959		
60246772002	**GW-074938-061217-CN-MW-3**	EPA 300.0	481783		
60246772003	**GW-074938-061217-CN-MW-6**	EPA 300.0	481783		

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Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60246772

60246772

Client Name: GHD P&G

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 7869 0826 1730 Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☒ Foam ☐ None ☐ Other ☐

Thermometer Used: CF +2.9 T-266 / CF +0.2 T-239 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 3.6 **Corr. Factor** CF +2.9 (CF +0.2) **Corrected** 3.8

Date and initials of person examining contents: JB 6/12/12

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☒Yes ☐No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒ N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: 6/19/12

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 1012	Start:
End: 1020	End:
Temp:	Temp:

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	GHD Services_COP NM	Report To:	Christine Mathews	Attention:	
Address:	6212 Indian School Rd, NE St2	Copy To:		Company Name:	
	Albuquerque, NM 87110			Address:	
Email:	christine.mathews@ghd.com	Purchase Order #:		Pace Quote:	
Phone:	505-884-0672 Fax:	Project Name:	074938 COP B-COM No. 1E	Pace Project Manager:	alice.spiller@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	8644, line 19

Regulatory Agency	
State / Location	
NM	

MATRIX CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Dissolved Metals-field filtered	Sulfate by 300.0	Residual Chlorine (Y/N)	60246772
1	GW-074938-061217-CN-MW-1	WT	G	6/12/17	1736				2										X	X		BP3U BP3F 60
2	GW-074938-061217-CN-MW-3			"	1755				2													60
3	GW-074938-061217-CN-MW-6			"	1815				2													60
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Time for MW-6 18:15					6/17/17	0830	3.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Charles Pelagn

SIGNATURE of SAMPLER: [signature] DATE Signed: 6-16-17

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Analytical Services, LLC
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December 20, 2017

Jeff Walker
GHD Services
6121 indian School Rd
Ste 200
Albuquerque, NM 87110

RE: Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Dear Jeff Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on October 28, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised Report Rev_1. Added dissolved Iron to the results and removed dissolved Selenium.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Alice Spiller

Alice Spiller
alice.spiller@pacelabs.com
(913)563-1409
Project Manager

Enclosures

cc: Angela Bown, GHD Services
Christine Mathews, GHD Services

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CERTIFICATIONS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

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SAMPLE SUMMARY

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60256789001	**GW-11146003-102717-CM-MW-1**	Water	10/27/17 09:23	10/28/17 08:55
60256789002	**GW-11146003-102717-CM-MW-3**	Water	10/27/17 09:45	10/28/17 08:55
60256789003	**GW-11146003-102717-CM-MW-6**	Water	10/27/17 09:15	10/28/17 08:55

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SAMPLE ANALYTE COUNT

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60256789001	**GW-11146003-102717-CM-MW-1**	EPA 6010	SMW, TDS	2	PASI-K
		EPA 300.0	OL	1	PASI-K
60256789002	**GW-11146003-102717-CM-MW-3**	EPA 6010	SMW, TDS	2	PASI-K
		EPA 300.0	OL	1	PASI-K
60256789003	**GW-11146003-102717-CM-MW-6**	EPA 6010	SMW, TDS	2	PASI-K
		EPA 300.0	OL	1	PASI-K

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ANALYTICAL RESULTS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Sample: GW-11146003-102717-CM-MW-1 **Lab ID: 60256789001** Collected: 10/27/17 09:23 Received: 10/28/17 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	**6690**	ug/L	50.0	1	11/06/17 16:22	12/04/17 16:39	7439-89-6	
Manganese, Dissolved	**1150**	ug/L	5.0	1	11/06/17 16:22	11/07/17 13:27	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**105**	mg/L	10.0	10		11/07/17 11:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Sample: GW-11146003-102717-CM-MW-3 **Lab ID: 60256789002** Collected: 10/27/17 09:45 Received: 10/28/17 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	50.0	1	11/06/17 16:22	12/04/17 16:41	7439-89-6	
Manganese, Dissolved	**136**	ug/L	5.0	1	11/06/17 16:22	11/07/17 13:29	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**171**	mg/L	20.0	20		11/07/17 11:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Sample: GW-11146003-102717-CM-MW-6 **Lab ID: 60256789003** Collected: 10/27/17 09:15 Received: 10/28/17 08:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	50.0	1	11/06/17 16:22	12/04/17 16:44	7439-89-6	
Manganese, Dissolved	**218**	ug/L	5.0	1	11/06/17 16:22	11/07/17 13:32	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**171**	mg/L	20.0	20		11/07/17 12:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

QC Batch: 501914 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60256789001, 60256789002, 60256789003

METHOD BLANK: 2054732 Matrix: Water
Associated Lab Samples: 60256789001, 60256789002, 60256789003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	11/07/17 12:52	
Manganese, Dissolved	ug/L	ND	5.0	11/07/17 12:52	

LABORATORY CONTROL SAMPLE: 2054733

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	9900	99	80-120	
Manganese, Dissolved	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2054734 2054735

Parameter	Units	60256788001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	6090	10000	10000	15400	15500	93	94	75-125	0	20	
Manganese, Dissolved	ug/L	4910	1000	1000	6040	6030	113	112	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

QC Batch: 501809 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60256789001, 60256789002, 60256789003

METHOD BLANK: 2054396 Matrix: Water
Associated Lab Samples: 60256789001, 60256789002, 60256789003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	11/07/17 00:18	

LABORATORY CONTROL SAMPLE: 2054397

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.5	110	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2054398 2054399

Parameter	Units	60257119002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	70.3	50	50	123	122	105	103	80-120	1	15	

MATRIX SPIKE SAMPLE: 2054400

Parameter	Units	60257119003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	70.8	50	121	101	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11146003 B-COM NO 1E
Pace Project No.: 60256789

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60256789001	**GW-11146003-102717-CM-MW-1**	EPA 3010	501914	EPA 6010	502045
60256789002	**GW-11146003-102717-CM-MW-3**	EPA 3010	501914	EPA 6010	502045
60256789003	**GW-11146003-102717-CM-MW-6**	EPA 3010	501914	EPA 6010	502045
60256789001	**GW-11146003-102717-CM-MW-1**	EPA 300.0	501809		
60256789002	**GW-11146003-102717-CM-MW-3**	EPA 300.0	501809		
60256789003	**GW-11146003-102717-CM-MW-6**	EPA 300.0	501809		

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Sample Condition Upon Receipt

WO# : 60256789

60256789

AFS

Client Name: GHD Services - New Mexico

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 7882 4048 6652 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: CF 0.0 T-266 / CF +0.3 T-239 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 3.3 **Corr. Factor** CF 0.0 / CF +0.3 **Corrected** 3.3

RLT 10-28-17
Date and initials of person examining contents:

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☒No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Alice Date: 10/31/17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	GHD Services, New Mexico	Report To:	Jeff Walker	Attention:	
Address:	6121 indian School Rd	Copy To:		Company Name:	
Albuquerque, NM 87110				Address:	
Email:	jeff.walker@ghd.com	Purchase Order #:		Pace Quote:	
Phone:	505-884-0672 Fax	Project Name:	11146003 B-Com No 1E	Pace Project Manager:	alice.spiller@pacelabs.com,
Requested Due Date:	Standard TAT	Project #:	11146003	Pace Profile #:	10540

Regulatory Agency

State / Location: NM

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	6010 Dissolved Fe, Mn	Sulfate by 300.0	Residual Chlorine (Y/N)	6025 6789
1	GW-11146003-102717-CM-MW-1	WT	G			10/27/17	923		2	1		1						Y	1	1		BP3U BP3N 001
2	GW-11146003-102717-CM-MW-3	WT	G			10/27/17	0945		2	1		1						Y	1	1		002
3	GW-11146003-102717-CM-MW-6	WT	G			10/27/17	0915		2	1		1						Y	1	1		003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Christine Matteus / GHD	10/27/17	1400		10/28	0755	3.3	4	-4	4

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Christine Matteus				
SIGNATURE of SAMPLER:	DATE Signed: 10/27/17				

Pace Container Order #285098

Addresses

Order By :		Ship To :		Return To:	
Company	GHD Services, New Mexico	Company	GHD Services, New Mexico	Company	Pace Analytical Kansas
Contact	Walker, Jeff	Contact	Walker, Jeff	Contact	Spiller, Alice
Email	jeff.walker@ghd.com	Email	jeff.walker@ghd.com	Email	alice.spiller@pacelabs.com
Address	6121 indian School Rd	Address	6121 indian School Rd	Address	9608 Loiret Blvd.
Address 2	Ste 200	Address 2	Ste 200	Address 2	
City	Albuquerque	City	Albuquerque	City	Lenexa
State	NM Zip 87110	State	NM Zip 87110	State	KS Zip 66219
Phone	505-884-0672	Phone	505-884-0672	Phone	(913)563-1409

Info

Project Name	11146003 B-Com No 1E	**Due Date**	10/17/2017	**Profile**	10540	**Quote**	
Project Manager	Spiller, Alice	**Return**		**Carrier**	FedEx	**Location**	NM

Trip Blanks

- [X] Include Trip Blanks

Bottle Labels

- [ ] Blank
- [X] Pre-Printed No Sample IDs
- [ ] Pre-Printed With Sample IDs

Bottles

- [ ] Boxed Cases
- [ ] Individually Wrapped
- [ ] Grouped By Sample

Return Shipping Labels

- [X] No Shipper Number
- [ ] With Shipper Number

COC Options

- [ ] Number of Blanks
- [X] Pre-Printed

Misc

- [ ] Sampling Instructions
- [X] Custody Seal
- [X] Temp. Blanks
- [X] Coolers
- [ ] Syringes
- [ ] Extra Bubble Wrap
- [ ] Short Hold/Rush Stickers
- [ ] DI Water Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of QC	Lot #	Notes
3	WT	6010 Dissolved Fe, Mn	250mL plastic, unpreserved	3	0	082817-2BXV	
3	WT	Sulfate by 300.0	250mL plastic unpres	3	0		
3	WT	6010 dissolved Fe,Mn-Field Filtered	250mL plastic, HNO3	3	0	091817-2AFW	

Hazard Shipping Placard In Place : NO

*Sample receiving hours are Mon-Fri 7:00am-6:00pm and Sat 8:00am-2:00pm unless special arrangements are made with your project manager.

*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.
*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage and disposal.
*Payment term are net 30 days.
*Please include the proposal number on the chain of custody to insure proper billing.

Sample Notes

Ship Date : 10/16/2017
Prepared By:
Verified By:

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

December 19, 2017

Jeff Walker
GHD Services
6121 indian School Rd
Ste 200
Albuquerque, NM 87110

RE: Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Dear Jeff Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on December 08, 2017. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Colleen Clyne
colleen.clyne@pacelabs.com
1(913)563-1406
Project Manager

Enclosures

cc: Angela Bown, GHD Services
Christine Mathews, GHD Services

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070

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SAMPLE SUMMARY

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60259870001	**GW-11146003-120617-SP-MW-1**	Water	12/06/17 09:40	12/08/17 09:10
60259870002	**GW-11146003-120617-SP-MW-3**	Water	12/06/17 09:58	12/08/17 09:10
60259870003	**GW-11146003-120617-SP-MW-6**	Water	12/06/17 10:24	12/08/17 09:10

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

SAMPLE ANALYTE COUNT

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60259870001	**GW-11146003-120617-SP-MW-1**	EPA 6010	TDS	2	PASI-K
		EPA 300.0	OL	1	PASI-K
60259870002	**GW-11146003-120617-SP-MW-3**	EPA 6010	TDS	2	PASI-K
		EPA 300.0	OL	1	PASI-K
60259870003	**GW-11146003-120617-SP-MW-6**	EPA 6010	TDS	2	PASI-K
		EPA 300.0	OL	1	PASI-K

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ANALYTICAL RESULTS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Sample: GW-11146003-120617-SP-MW-1 **Lab ID: 60259870001** Collected: 12/06/17 09:40 Received: 12/08/17 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	**4890**	ug/L	50.0	1	12/13/17 10:38	12/15/17 14:56	7439-89-6	
Manganese, Dissolved	**1020**	ug/L	5.0	1	12/13/17 10:38	12/15/17 14:56	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**44.9**	mg/L	5.0	5		12/17/17 13:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Sample: GW-11146003-120617-SP-MW-3 **Lab ID: 60259870002** Collected: 12/06/17 09:58 Received: 12/08/17 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	50.0	1	12/13/17 10:38	12/15/17 14:59	7439-89-6	
Manganese, Dissolved	**36.1**	ug/L	5.0	1	12/13/17 10:38	12/15/17 14:59	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**189**	mg/L	20.0	20		12/17/17 13:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Sample: GW-11146003-120617-SP-MW-6 **Lab ID: 60259870003** Collected: 12/06/17 10:24 Received: 12/08/17 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, Dissolved	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Iron, Dissolved	ND	ug/L	50.0	1	12/13/17 10:38	12/15/17 15:06	7439-89-6	
Manganese, Dissolved	**311**	ug/L	5.0	1	12/13/17 10:38	12/15/17 15:06	7439-96-5	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Sulfate	**176**	mg/L	20.0	20		12/17/17 13:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

QC Batch: 507060 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET Dissolved
Associated Lab Samples: 60259870001, 60259870002, 60259870003

METHOD BLANK: 2077289 Matrix: Water
Associated Lab Samples: 60259870001, 60259870002, 60259870003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron, Dissolved	ug/L	ND	50.0	12/15/17 14:38	
Manganese, Dissolved	ug/L	ND	5.0	12/15/17 14:38	

LABORATORY CONTROL SAMPLE: 2077290

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Dissolved	ug/L	10000	10200	102	80-120	
Manganese, Dissolved	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2077291 2077292

Parameter	Units	60259839001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron, Dissolved	ug/L	248	10000	10000	10400	10500	101	102	75-125	1	20	
Manganese, Dissolved	ug/L	674	1000	1000	1690	1700	102	103	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

QC Batch: 507612 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60259870001, 60259870002, 60259870003

METHOD BLANK: 2079842 Matrix: Water
Associated Lab Samples: 60259870001, 60259870002, 60259870003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	ND	1.0	12/17/17 09:16	

LABORATORY CONTROL SAMPLE: 2079843

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.4	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2079844 2079845

Parameter	Units	60259777001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	47.1	25	25	73.8	73.4	107	105	80-120	1	15	

MATRIX SPIKE SAMPLE: 2079846

Parameter	Units	60259839001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	321	250	592	108	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11146003 B-COM NO 1E
Pace Project No.: 60259870

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60259870001	**GW-11146003-120617-SP-MW-1**	EPA 3010	507060	EPA 6010	507123
60259870002	**GW-11146003-120617-SP-MW-3**	EPA 3010	507060	EPA 6010	507123
60259870003	**GW-11146003-120617-SP-MW-6**	EPA 3010	507060	EPA 6010	507123
60259870001	**GW-11146003-120617-SP-MW-1**	EPA 300.0	507612		
60259870002	**GW-11146003-120617-SP-MW-3**	EPA 300.0	507612		
60259870003	**GW-11146003-120617-SP-MW-6**	EPA 300.0	507612		

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60259870

60259870

Client Name: GHD

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 7888 1801 3516 Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐ CK

Thermometer Used: CF 0.0 T-268 / CF +0.2 T-239 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 3.2 **Corr. Factor** CF 0.0 CF +0.2 **Corrected** 3.2

Date and initials of person examining contents: JB 12/8/17

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☒Yes ☐No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	
Cyanide water sample checks: ☒N/A Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: CMC Date: 12/12/17

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	GHD Services, New Mexico	Report To:	Jeff Walker	Attention:	
Address:	6121 indian School Rd	Copy To:		Company Name:	
	Albuquerque, NM 87110			Address:	
Email:	jeff.walker@ghd.com	Purchase Order #:		Pace Quote:	
Phone:	505-884-0672 Fax:	Project Name:	11146003 B-Com No 1E	Pace Project Manager:	alice.spiller@pacelabs.com,
Requested Due Date:		Project #:		Pace Profile #:	10540

Regulatory Agency

State / Location: NM

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	6010 Dissolved Fe, Mn	Sulfate by 300.0	Residual Chlorine (Y/N)	60259570
1	GW-11146003-120617-SP-MW-1	WT	G	12/6/17	940				3	X		X							X	X		(2)BP3N BP3F 001
2	GW-11146003-120617-SP-MW-3	↓	↓	↓	958				3	X		X							X	X		002
3	GW-11146003-120617-SP-MW-6	↓	↓	↓	1029				3	X		X							X	X		003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Steven Perez	12/7/17	1515		12/8/17	0910	3.2	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Steven Perez

SIGNATURE of SAMPLER: Steven Perez DATE Signed: 12/7/17

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)