2018

ANNUAL GROUND WATER REPORT AND COMMUNICATION

RCVD Via Email 1/22/19

Smith, Cory, EMNRD

From: Smith, Cory, EMNRD
Sent: Monday, January 28, 2019 11:46 AM
To: Clara Cardoza; Fields, Vanessa, EMNRD
Cc: filing@craworld.com; Griswold, Jim, EMNRD; 'Jeff.Walker@ghd.com'; Steve Austin (nnepawq@frontiernet.net)
Subject: RE: 3R-432 Charles et al #1 2018 Annual GWM Rpt. ~RPT-11146002~

Clara,

OCD and received and reviewed the Charles et Al #1 2018 Annual Ground Water Report for 3R-432 and has accepted for record the report with the following conditions.

- OCD will require **8** consecutive quarters of sampling per 20.6.2.4103 NMAC (Unless HEC can provide to OCD an APPROVED plan that states otherwise.)
- HEC need to include additional information for vadose zone delineation/sampling that occurred during the excavation in July of 2016. Executive summary of the excavation, size, amount of soils removed, results of any sampling if no sampling HEC needs to explain why.)
- After review, HEC/COPC has never sampled MW-1/1R for all constituents listed in 20.2.6.3103 NMAC Prior to closure sampling at least 1 sampling including all the constituents will need to be collected. Please keep in mind if the sampling results indicate elevated levels additional sampling and or monitor wells may be required.

OCD has also assigned this incident to below highlighted incident# please include this on all communication and reports going forward.

NRMD0928136813 CHARLES ET AL #001 @ 30-045-06623

General Incident Information

Site Name:	CHARLES ET AL #001
Well:	[30-045-06623] CHARLES ET AL #001
Facility:	
Operator:	[373888] Harvest Four Corners, LLC
Status:	Closure Not Approved
Type:	Natural Gas Release
District:	Aztec
Incident Location:	J-12-27N-09W 1450 FSL 1450 FEL
Lat/Long:	36.5864296,-107.7359238 NAD83

All other requirements remain the same as previously communicated. Acceptance of this Annual ground water report does not relieve HEC of any other requirements imposed by other regulatory agencies.

Cory Smith
Environmental Specialist
Oil Conservation Division
Energy, Minerals, & Natural Resources
1000 Rio Brazos, Aztec, NM 87410
(505)334-6178 ext 115
cory.smith@state.nm.us

From: Jeff.Walker@ghd.com <Jeff.Walker@ghd.com>
Sent: Tuesday, January 22, 2019 10:12 AM
To: Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>
Cc: Clara Cardoza <ccardoza@hilcorp.com>; filing@craworld.com
Subject: [EXT] 3R-432 Charles et al #1 2018 Annual GWM Rpt. ~RPT-11146002~

Cory/Vanessa,

Please find attached the 2018 Annual Groundwater Monitoring report for the subject site, submitted on behalf of Hilcorp Energy. Please let Clara or me know if you have any questions regarding this document or the site.

Also, please acknowledge receipt for record keeping.

Thank you-Jeff

Jeffrey L. Walker
Sr. Project Manager

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2018 Annual Groundwater Monitoring Report

Charles et al No. 1
San Juan County, New Mexico
API# 30-045-06623
NMOCD# 3R-432

Hilcorp Energy Company

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

11146002| Report No 2 | January 2019

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1. Introduction

This Annual Groundwater Monitoring Report presents groundwater data collected during the 2018 reporting period by GHD Services, Inc. (GHD) on behalf of Hilcorp Energy Company (Hilcorp) at the Charles et al. No. 1 site (hereafter referred to as the "Site"). The Site is operated by Hilcorp after their acquisition of ConocoPhillips Company (COP) San Juan Basin assets in April 2017. The Site is located on Navajo Nation allotted land in Blanco Canyon, Section 12, Township 27N, Range 9W, of San Juan County, New Mexico. Geographical coordinates for the site are 36°35'10.25" North, 107°44'24.89" West. A Site Vicinity Map and Site Detail Map are included as Figures 1 and 2, respectively.

1.1 Background

The Charles et al. No. 1 natural gas well was spudded in April 1965 by the Austral Oil Company of Houston, Texas. Operatorship of the well was transferred several times before a subsidiary of Burlington Resources became the operator in August 1992. COP acquired Burlington Resources on March 30, 2006. COP plugged and abandoned the well on June 11, 2010.

A COP employee discovered an area of dead vegetation approximately 100 feet from the Blanco Canyon wash and approximately ¼ mile from the Charles et al. No. 1 wellhead while investigating a pipeline release on June 23, 2008. Envirotech, Inc. (Envirotech) installed seven piezometer/monitoring wells using a hand auger in June 2008. A solar powered fan apparatus was installed over monitoring well MW-1 in August 2008 to facilitate soil vapor extraction (SVE) remediation of the area. The SVE equipment was removed in June 2017 when MW-1 was plugged and abandoned, as detailed below.

Envirotech conducted quarterly groundwater sampling events beginning June 2008. Tetra Tech, Inc. (Tetra Tech) began monitoring the Charles et al. No. 1 remediation site in March 2010. Site consulting responsibilities were transferred from Tetra Tech to GHD (formerly CRA) on June 15, 2011.

In June 2016, the shallow monitor wells MW-1 through MW-7 were pulled from the ground using a backhoe. The wells had not displayed any hydrocarbon concentrations above standards (with the exception of MW-1) in 10 years.

A workplan that included the plugging and abandonment of all site monitor wells and a limited soils excavation was submitted to the Federal Indian Minerals Office, a division of the United States Department of the Interior's Office of Natural Resources Revenue, and the Federal Bureau of Land Management. Approvals from these agencies were received and a Pre-Construction Notification, required as a condition of the wetlands study of the area, was issued to the United States Army Corps of Engineers and to the Navajo Environmental Protection Agency (NNEPA). The wetlands study was conducted by SME Environmental Consultants of Durango, Colorado, prior to excavation activities, to assess potential impacts on designated wetlands aquatic resources.

The planned soil excavation and removal was conducted in June 2016 to address the pocket of hydrocarbon-impacted soils impacting groundwater in the immediate area of MW-1. Approximately

30 cubic yards of hydrocarbon impacted soils were removed and disposed of at the Envirotech Landfarm. The excavation area was limited due to encroachment upon two separate pipelines-the abandoned COP and Chevron pipelines-crossing through the Site. A replacement monitor well MW-1R was installed via hand auger in approximately the same location as the former MW-1. The historical timeline for the Site is presented in Table 1.

2. Groundwater Monitoring Methodology and Analytical Results

Groundwater sampling at monitor well MW-1R was conducted by GHD at the Site on March 13, June 25 and September 4, 2018. Hillcorp conducted groundwater monitoring at the Site on December 6, 2018.

2.1 Groundwater Monitoring Methodology

Prior to collection of groundwater samples, depth to groundwater well was measured in MW-1R using a water level meter (Table 2).

The groundwater sample for each sampling event was analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8260. Prior to sampling, the purging of at least three casing volumes of groundwater was attempted at MW-1R using a 0.5 inch diameter, polyethylene bailer. This well typically went dry due to slow formation recharge before this volume could be achieved. Groundwater quality parameters were not able to be collected during 2018 monitoring events due to insufficient groundwater volume.

2.2 Analytical Results

The NNEPA has not established groundwater quality standards; however, drinking water quality on Navajo Nation land is mandated in Part II of the Navajo Nation Primary Drinking Water Regulations (NNPDWR). Drinking water quality standards have been set for the protection of human health, domestic water supply, and irrigation use. The 2018 analytical results of the quarterly groundwater sampling events are discussed below:

- Benzene: The NNPDWR standard for benzene is 0.005 milligrams per liter (mg/L). Groundwater samples collected from monitoring well MW-1R during the four quarterly events in 2018 were at concentrations below the laboratory reporting limits (LRLs). While it can be argued that these results are ‘non-detect’ the LRLs were at levels above the NNPDWR standard and so there is uncertainty in whether these results are below the standard.
- Toluene: The NNPDWR standard for toluene is 1.0 mg/L. Groundwater samples collected from monitoring well MW-1R in 2018 contained toluene at concentrations ranging from below the LRL to 1.01 mg/L.
- Ethylbenzene: The NNPDWR standard for ethylbenzene is 0.7 mg/L. Groundwater samples collected from monitoring well MW-1R in 2018 contained ethylbenzene at concentrations ranging from below the LRL to 0.922 mg/L.

- Xylenes: The NNPDWR standard for ethylbenzene is 10 mg/L. Groundwater samples collected from monitoring well MW-1R in 2018 contained xylenes at concentrations ranging from 1.55 mg/L to 4.80 mg/L

An historical laboratory analytical summary is available as Table 3. Copies of laboratory analytical reports for the 2018 quarterly groundwater sampling events are included in Appendix C. A hydrocarbon concentration in groundwater map for the 2018 sampling events is included as Figure 3.

3. Conclusions and Recommendations

Concentrations of benzene in Site groundwater were below LRLs for all four quarters during 2018 but LRLs were above the NNPDWR reporting limit for this constituent. Future groundwater monitoring efforts should ensure analytical laboratories are reporting benzene concentrations to this NNPDWR standard. The concentration of toluene in groundwater was above the NNPDWR standard in June of 2018 and ethylbenzene exceeded the standard in March and December 2018.

Historical groundwater sampling results from former monitor wells MW-2 through MW-7, which were essentially non-detect for BTEX constituents from 2008 until their removal in 2017, would indicate that the BTEX plume that remains in groundwater near MW-1R is stable and immobile in the subsurface. The trend in benzene concentrations further support intrinsic biodegradation of petroleum hydrocarbons is occurring at the Site.

GHD recommends groundwater monitoring at the Site continue on a quarterly schedule to monitor the natural attenuation of BTEX constituents.

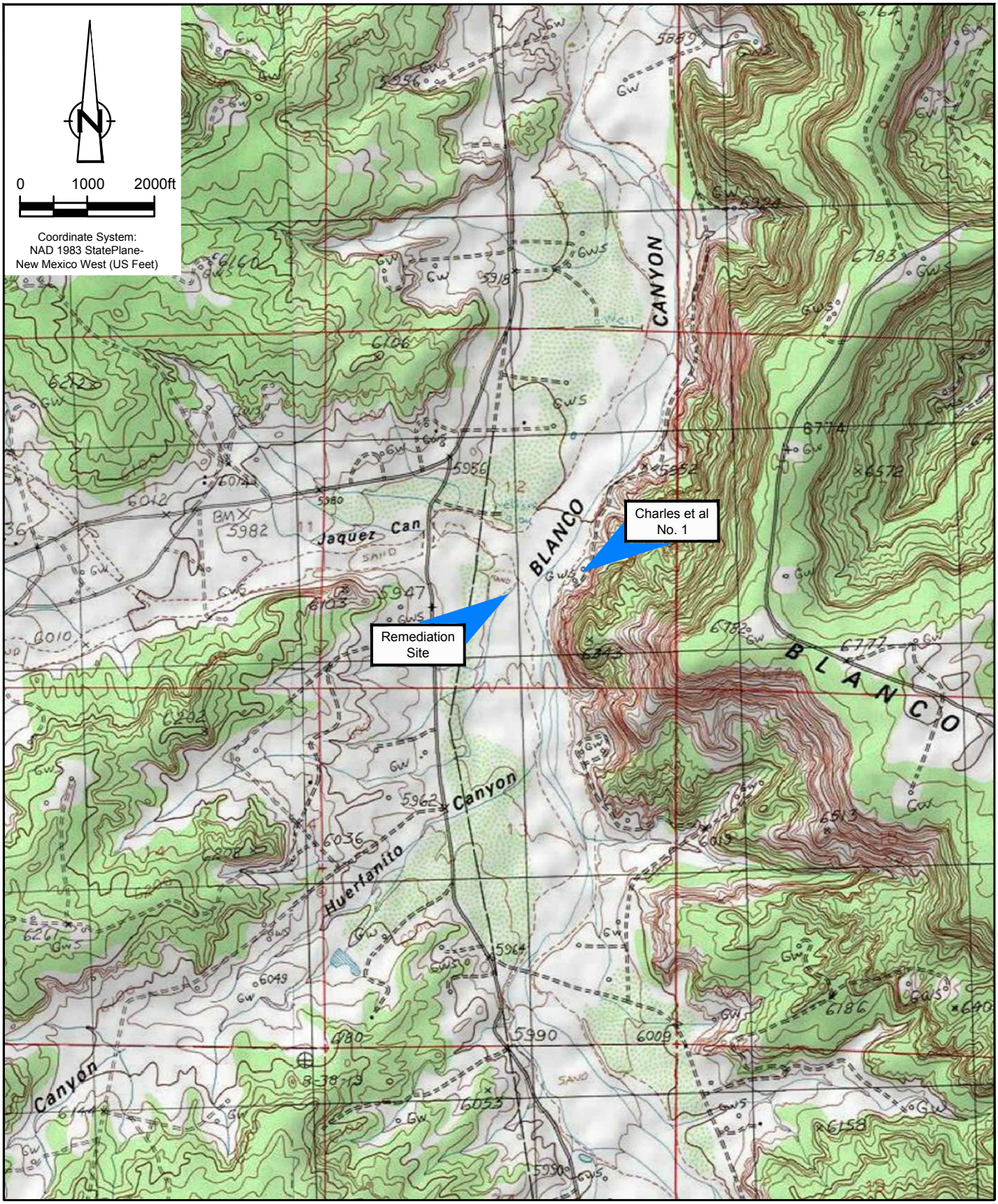
Respectfully Submitted,

GHD

Jeff Walker
Senior Project Manager

Alan Brandon
Senior Project Manager

Figures



Source: USGS 7.5 Minute Quad "Fresno Canyon and Huerfanito Peak, New Mexico"

Lat/Long: 36.5861° North, 107.7401° West

HILCORP ENERGY COMPANY
SEC 12, T27N-R9W, SAN JUAN COUNTY, NEW MEXICO
CHARLES et al. No. 1

11146002-00

Jan 2, 2019

SITE LOCATION MAP

FIGURE 1

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11146002-Hilcorp-Charles et al No. 1\11146002-00(002)GN-DL001.dwg

Source: Tetratech, Inc. figure, "Site Layout Map"

Lat/Long: 36.5861° North, 107.7401° West

0 10 30ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

HILCORP ENERGY COMPANY
SEC 12, T27N-R9W, SAN JUAN COUNTY, NEW MEXICO
CHARLES et al. No. 1

11146002-00

Jan 2, 2019

SITE DETAIL MAP

FIGURE 2

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11146002-Hilcorp-Charles et al No. 1\11146002-00(002)GN-DL001.dwg

Lat/Long: 36.5861° North, 107.7401° West

0 10 30ft

Coordinate System:
NAD 1983 StatePlane-
New Mexico West (US Feet)

HILCORP ENERGY COMPANY
SEC 12, T27N-R9W, SAN JUAN COUNTY, NEW MEXICO
CHARLES et al. No. 1

11146002-00

Jan 2, 2019

2018 GROUNDWATER CONCENTRATION MAP

FIGURE 3

CAD File: I:\CAD\Files\Eight Digit Job Numbers\1114----\11146002-Hilcorp-Charles et al No. 1\11146002-00(002)GN-DL001.dwg

Tables

Table 1

Site Historical Timeline
Hilcorp Energy Company
Charles et al. No. 1

Date/Time Period	*Event/Action*	*Description/Comments*
April 12, 1965	Well Spudded	Well spudded by Austral Oil Company Inc.
March 30, 1978	Operator Change	Change in operatorship to the Superior Oil Company.
September 1, 1986	Operator Change	Change in operatorship to Mobil Producing TX and NM Inc.
August 1, 1992	Operator Change	Change in operatorship to Meridian Oil Inc, a subsidiary of Burlington Resources.
August 1, 2001	Well Abandoned	Burlington Resources abandons well due to low production.
May 20, 2003	Well Returns to Production	The Charles et al. No. 1 natural gas well returned to production.
March 31, 2006	Operator Change	ConocoPhillips acquires Burlington Resources.
June 23, 2008	Release Discovered	A release was discovered from the pipeline running from the wellhead to the meter house; upon walking the pipeline, an area of dead vegetation was also discovered approximately 100 feet from Blanco Wash.
June 24, 2008	Release Reported	ConocoPhillips reported the release to the New Mexico Oil Conservation Division (NMOCD) via phone and email.
June 25-26, 2008	Initial Site Assessment	Envirotech, Inc. of Farmington, NM advances several soil borings and installed piezometers using a hand auger to determine the extent of impact (Envirotech, 2009). Envirotech also installed Monitor Wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7; and obtained water level measurements and samples from all of the wells.
August 14, 2008	Soil Vapor Extraction System Installed	Envirotech, Inc. installed solar-powered Soil Vapor Extraction (SVE) equipment over the existing Monitor Well, MW-1; and obtained water level measurements and samples from all of the wells.
October 2, 2008	Groundwater Monitoring	Envirotech, Inc. completed the third round of groundwater sampling.
January 13, 2009	Groundwater Monitoring	Envirotech, Inc. completed the fourth round of groundwater sampling.
March 23, 2009	Groundwater Monitoring	Envirotech, Inc. completed the fifth round of groundwater sampling and recommended sampling only Monitor Wells MW-1, MW-2, MW-3, and MW-4.
June 29, 2009	Groundwater Monitoring	Envirotech, Inc. completed the sixth round of groundwater sampling and recommended drilling additional monitor wells downgradient of MW-2.
March 30, 2010	Groundwater Monitoring	Tetra Tech, Inc. completed quarterly groundwater sampling.
June 11, 2010	Well Abandoned	Charles et al. No. 1 is plugged and abandoned by ConocoPhillips.
June 11, 2010	Groundwater Monitoring	Tetra Tech, Inc. completed quarterly groundwater sampling.
September 21, 2010	Groundwater Monitoring	Tetra Tech, Inc. completed quarterly groundwater sampling. An oil absorbant sock was placed in MW-1.
December 16, 2010	Groundwater Monitoring	Tetra Tech, Inc. completed quarterly groundwater sampling. The benzene concentration in MW-1 exceeded the Navajo Nation Primary Drinking Water Regulations (NNPDWR) standard. Oil absorbant sock in MW-1 was replaced.
March 18, 2011	Groundwater Monitoring	Tetra Tech, Inc. completed quarterly groundwater sampling. The benzene concentration in MW-1 exceeded the NNPDWR standard. Oil absorbant sock in MW-1 was replaced.
June 15, 2011	Transfer of Site Consulting Responsibilities	On June 15, 2011, Site consulting responsibilities were transferred from Tetra Tech of Albuquerque, NM to Conestoga-Rovers & Associates (CRA) of Albuquerque, NM.
June 23, 2011	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene and ethylbenzene concentrations in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
September 26, 2011	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene and ethylbenzene concentrations in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
December 12, 2011	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standard. Oil absorbant sock in MW-1 was replaced.
March 7, 2012	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standard. Oil absorbant sock in MW-1 was replaced.
June 4, 2012	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene, toluene, and ethylbenzene levels in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
September 17, 2012	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene, toluene, and ethylbenzene concentrations in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
January 9, 2013	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene and toluene concentrations in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
March 18, 2013	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
June 14, 2013	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene and Toluene concentrations in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
September 13, 2013	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene and Toluene concentrations in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
December 13, 2013	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
March 21, 2014	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 did not exceed the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
June 16, 2014	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
September 19, 2014	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standards. Oil absorbant sock in MW-1 was replaced.
December 17, 2014	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standards.
March 19, 2015	Groundwater Monitoring	CRA completed quarterly groundwater sampling. All constituents were below NNPDWR standards.
June 19, 2015	Groundwater Monitoring	CRA completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standards.
September 14, 2015	Groundwater Monitoring	GHD (formerly CRA) completed quarterly groundwater sampling. Benzene concentration in MW-1 exceeded the NNPDWR standards.
June 2, 2016	MW Plugging and Abandonment	GHD and contractor MMT plug and abandon all existing site monitor wells (MW-1 thru MW-7).
June 6, 2016	Soil Excavation/MW replacement	GHD and contractor MMT excavate 10 X 12 ft X 7 ft deep excavation (~30cy) centered around MW-1. MW-1 replaced with 1" PVC MW-1R
July 1, 2016	Reseeding	Excavation site reseeded with High Plains Foothills Wet Meadow Mix from Western Native Seed Co.
September 12, 2016	Groundwater Monitoring	Quarterly groundwater sampling: Benzene concentration in MW-1R below NNPDWR standard.
November 28, 2016	Groundwater Monitoring	Quarterly groundwater sampling: Benzene concentration in MW-1R exceeds NNPDWR standard.
March 6, 2017	Groundwater Monitoring	Quarterly groundwater sampling: Benzene concentration in MW-1R below NNPDWR standard.
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	Groundwater Monitoring	Quarterly groundwater sampling: Benzene concentration in MW-1R exceeds NNPDWR standard.
September 25, 2017	Groundwater Monitoring	Quarterly groundwater sampling: Benzene concentration in MW-1R below NNPDWR standard.
December 4, 2017	Groundwater Monitoring	Quarterly groundwater sampling: Benzene concentration in MW-1R exceeds NNPDWR standard.
March 13, 2018	Groundwater Monitoring	Quarterly groundwater sampling: ethylbenzne concentration in MW-1R exceeds NNPDWR standard.
June 25, 2018	Groundwater Monitoring	Quarterly groundwater sampling: toluene concentration in MW-1R exceeds NNPDWR standard..
September 4, 2018	Groundwater Monitoring	Quarterly groundwater sampling: all BTEX constituents below NNPDWR standards in MW-1R.
December 4, 2018	Groundwater Monitoring	Quarterly groundwater sampling: ethylbenzne concentration in MW-1R exceeds NNPDWR standard.

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Charles et al. No. 1

Well ID	TOC Elevation* (ft AMSL)	Date Measured	Depth to Groundwater (ft below TOC)	Relative Water Level (ft AMSL)
MW-1	5917.87	6/25/2008	4.71	5913.16
		8/14/2008	5.21	5912.66
	5917.05	10/2/2008	5.13	5911.92
		1/13/2009	4.41	5912.64
		3/23/2009	3.01	5914.04
		6/29/2009	2.12	5914.93
		3/30/2010	2.68	5914.37
		6/11/2010	4.74	5912.31
		9/21/2010	5.52	5911.53
		12/16/2010	3.71	5913.34
		3/18/2011	2.98	5914.07
		6/23/2011	4.99	5912.06
		9/27/2011	4.55	5912.50
		12/12/2011	3.23	5913.82
		3/7/2012	3.67	5913.38
		6/4/2012	4.75	5912.30
		9/17/2012	5.57	5911.48
		1/9/2013	3.87	5913.18
		3/18/2013	3.09	5913.96
		6/14/2013	4.83	5912.22
		9/13/2013	5.42	5911.63
		12/13/2013	3.67	5913.38
		3/21/2014	3.27	5913.78
		6/16/2014	5.13	5911.92
		9/19/2014	5.70	5911.35
		12/17/2014	4.22	5912.83
		3/19/2015	3.36	5913.69
		6/19/2015	4.34	5912.71
		9/14/2015	5.55	5911.50
		6/2/2016	Plugged and Abandoned	
MW-1R	Not Determined	6/23/2016	6.28	--
		9/12/2016	6.49	--
		11/28/2016	5.13	--
		3/6/2017	4.29	--
		6/12/2017	3.07	--
		9/25/2017	3.38	--
		12/4/2017	1.84*	--
		3/13/2018	1.85*	--
		6/25/2018	3.25**	--
		9/4/2018	3.53**	--
		12/6/2018	4.04**	--
MW-2	5917.33	6/25/2008	4.66	5912.67
		8/14/2008	5.35	5911.98
	5916.53	10/2/2008	5.12	5911.41
		1/13/2009	3.15	5913.38
		3/23/2009	2.65	5913.88
		6/29/2009	4.20	5912.33
		3/30/2010	2.57	5913.96
		6/11/2010	4.63	5911.90
		9/21/2010	5.53	5911.00
		12/16/2010	3.53	5913.00
		3/18/2011	2.70	5913.83
		6/23/2011	4.80	5911.73
		9/27/2011	4.30	5912.23
		12/12/2011	3.13	5914.20
		3/7/2012	2.58	5913.95
		6/4/2012	4.51	5912.02
		9/17/2012	5.56	5910.97
		1/9/2013	3.75	5912.78
		3/18/2013	3.02	5913.51
		6/14/2013	4.69	5911.84
		9/13/2013	5.09	5911.44
		12/13/2013	3.55	5912.98
		3/21/2014	3.15	5913.38
		6/16/2014	4.98	5911.55
		9/19/2014	5.49	5911.04
		12/17/2014	4.11	5912.42
		3/19/2015	3.30	5913.23
		6/19/2015	4.24	5912.29
		9/14/2015	5.57	5910.96
		6/2/2016	Plugged and Abandoned	

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Charles et al. No. 1

Well ID	*TOC Elevation* (ft AMSL)*	*Date Measured*	*Depth to Groundwater (ft below TOC)*	*Relative Water Level (ft AMSL)*
MW-3	5920.57	6/25/2008	7.16	5913.41
		8/14/2008	8.86	5911.71
	5919.8	10/2/2008	7.63	5912.17
		1/13/2009	5.56	5914.24
		3/23/2009	5.56	5914.24
		6/29/2009	1.10	5918.70
		3/30/2010	5.38	5914.42
		6/11/2010	7.44	5912.36
		9/21/2010	8.22	5911.58
		12/16/2010	6.06	5913.74
		3/18/2011	5.42	5914.38
		6/23/2011	7.68	5912.89
		9/27/2011	7.13	5912.67
		12/12/2011	5.78	5914.79
		3/7/2012	5.33	5914.47
		6/4/2012	7.27	5912.53
		9/17/2012	8.15	5911.65
		1/9/2013	6.37	5913.43
		3/18/2013	5.68	5914.12
		6/14/2013	7.36	5912.44
		9/13/2013	7.72	5912.08
		12/13/2013	6.20	5913.60
		3/21/2014	5.89	5913.91
		6/16/2014	7.71	5912.09
		9/19/2014	8.13	5911.67
		12/17/2014	6.71	5913.09
		3/19/2015	5.98	5913.82
		6/19/2015	7.01	5912.79
		9/14/2015	8.21	5911.59
		6/2/2016	Plugged and Abandoned	
MW-4	5920.48	6/25/2008	4.27	5916.21
		8/14/2008	7.89	5912.59
	5919.69	10/2/2008	7.73	5911.96
		1/13/2009	5.94	5913.75
		3/23/2009	5.64	5914.05
		6/29/2009	6.84	5912.85
		3/30/2010	5.40	5914.29
		6/11/2010	7.23	5912.46
		9/21/2010	8.17	5911.52
		12/16/2010	6.24	5913.45
		3/18/2011	5.50	5914.19
		6/23/2011	7.50	5912.19
		9/27/2011	6.98	5912.71
		12/12/2011	5.94	5914.54
		3/7/2012	5.36	5914.33
		6/4/2012	7.18	5912.51
		9/17/2012	8.18	5911.51
		1/9/2013	6.53	5913.16
		3/18/2013	5.81	5913.88
		6/14/2013	7.40	5912.29
		9/13/2013	7.77	5911.92
		12/13/2013	6.37	5913.32
		3/21/2014	6.03	5913.66
		6/16/2014	7.63	5912.06
		9/19/2014	8.09	5911.60
		12/17/2014	6.87	5912.82
		3/19/2015	6.05	5913.64
		6/19/2015	6.92	5912.77
		9/14/2015	DRY (1)	NA
		6/2/2016	Plugged and Abandoned	

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Charles et al. No. 1

Well ID	*TOC Elevation* (ft AMSL)*	*Date Measured*	*Depth to Groundwater (ft below TOC)*	*Relative Water Level (ft AMSL)*
MW-5	5923.63	6/26/2008	8.23	5915.40
		8/14/2008	8.68	5914.95
	5921.55	10/2/2008	8.70	5912.85
		1/13/2009	6.96	5914.59
		3/23/2009	6.58	5914.97
		6/29/2009	4.10	5917.45
		3/30/2010	NM	NM
		6/11/2010	8.20	5913.35
		9/21/2010	9.25	5912.30
		12/16/2010	7.40	5914.15
		3/18/2011	6.74	5914.81
		6/23/2011	NM	NM
		9/26/2011	8.25	5913.30
		12/12/2011	7.12	5916.51
		3/7/2012	6.65	5914.90
		6/4/2012	8.17	5913.38
		9/17/2012	9.30	5912.25
		1/9/2013	7.76	5913.79
		3/18/2013	7.05	5914.50
		6/14/2013	8.49	5913.06
		9/13/2013	8.97	5912.58
		12/13/2013	7.55	5914.00
		3/21/2014	7.17	5914.38
		6/16/2014	8.72	5912.83
		9/19/2014	9.35	5912.20
		12/17/2014	8.07	5913.48
		3/19/2015	7.33	5914.22
		6/19/2015	8.24	5913.31
		9/14/2015	9.48	5912.07
		6/2/2016	Plugged and Abandoned	
MW-6	5920.68	6/26/2008	6.75	5913.93
		8/14/2008	6.97	5913.71
	5918.64	10/2/2008	6.83	5911.81
		1/13/2009	4.89	5913.75
		3/23/2009	4.12	5914.52
		6/29/2009	1.80	5916.84
		3/30/2010	NM	NM
		6/11/2010	6.63	5912.01
		9/21/2010	7.41	5911.23
		12/16/2010	5.12	5913.52
		3/15/2011	4.49	5914.15
		6/23/2011	6.80	5911.84
		9/26/2011	6.33	5912.31
		12/12/2011	4.84	5915.84
		3/7/2012	4.46	5914.18
		6/4/2012	6.45	5912.19
		9/17/2012	7.37	5911.27
		1/9/2013	5.46	5913.18
		3/18/2013	4.80	5913.84
		6/14/2013	6.60	5912.04
		9/13/2013	6.90	5911.74
		12/13/2013	5.32	5913.32
		3/21/2014	5.03	5913.61
		6/16/2014	6.85	5911.79
		9/19/2014	7.34	5911.30
		12/17/2014	5.79	5912.82
		3/19/2015	5.22	5913.42
		6/19/2015	6.21	5912.43
		9/14/2015	DRY (1)	NA
		6/2/2016	Plugged and Abandoned	

Table 2

Monitoring Well Specifications and Groundwater Elevations
Hilcorp Energy Company
Charles et al. No. 1

Well ID	*TOC Elevation* (ft AMSL)*	*Date Measured*	*Depth to Groundwater (ft below TOC)*	*Relative Water Level (ft AMSL)*
MW-7	5920.75	6/26/2008	6.32	5914.43
		8/14/2008	7.17	5913.58
	5918.74	10/2/2008	6.42	5912.32
		1/13/2009	NM	NM
		3/23/2009	4.67	5914.07
		6/29/2009	1.56	5917.18
		3/30/2010	NM	NM
		6/11/2010	NM	NM
		9/21/2010	NM	NM
		12/16/2010	4.91	5913.83
		3/18/2011	DRY (1)	NA
		6/23/2011	6.55	5912.19
		9/26/2011	6.14	5912.60
		12/12/2011	DRY (1)	NA
		3/7/2012	DRY (1)	NA
		6/4/2012	6.08	5912.66
		9/17/2012	7.11	5911.63
		1/9/2013	5.28	5913.46
		3/18/2013	4.54	5914.20
		6/14/2013	6.31	5912.43
		9/13/2013	6.66	5912.08
		12/13/2013	5.35	5913.39
		3/21/2014	4.70	5914.04
		6/16/2014	6.59	5912.15
		9/19/2014	7.14	5911.60
		12/17/2014	5.59	5913.15
		3/19/2015	4.98	5913.76
		6/19/2015	6.10	5912.64
		9/14/2015	7.34	5911.40
		6/3/2016	Plugged and Abandoned	

Notes:
Measurements between 6/25/2008 and 6/29/2009 obtained by Envirotech, Inc.
ft = feet
AMSL = Above mean sea level
NA = Not available
NM = Not measured
* PVC casing stick up broken off, likely by cattle. Shallower depth to water reflects new top of casing measuring point.
**Section of PVC reattached above ground surface. Depth to water reflects new measuring point.

Table 3

Groundwater Analytical Results Summary
Hilcorp Energy Company
Charles et al. No. 1

Well ID	Sample ID	Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)
NNPDWR Standards				***0.005***	***1***	***0.7***	***10***
MW-1	MW-1	6/25/2008	(orig)	**1.85**	0.486	**0.971**	0.379
	MW-1	9/25/2008	(orig)	**0.575**	0.66	0.293	1.547
	MW-1	1/13/2009	(orig)	**0.494**	0.581	0.474	3.572
	MW-1	3/23/2009	(orig)	**0.21**	0.311	0.378	1.418
	MW-1	6/29/2009	(orig)	**0.839**	0.107	0.674	3.404
	MW-1	3/30/2010	(orig)	**0.48**	0.11	0.25	1.573
	MW-1	6/11/2010	(orig)	**3.2**	0.45	0.69	4.51
	MW-1	9/21/2010	(orig)	**2.3**	**1.1**	0.25	4.84
	MW-1	12/16/2010	(orig)	**0.18**	0.2	0.25	1.79
	MW-1	3/18/2011	(orig)	**0.15**	0.14	0.16	1.083
	GW-74935-062311-PG04	6/23/2011	(orig)	**3.2**	0.933	**0.972**	5.8
	GW-74935-062311-PG05	6/23/2011	(Duplicate)	**3.38**	**1.45**	**1.06**	6.76
	GW-074935-092611-CM-008	9/26/2011	(orig)	**1.56**	**2.61**	0.624	6.59
	GW-074935-092611-CM-009	9/26/2011	(Duplicate)	**1.57**	**3.02**	**0.756**	7.26
	GW-074935-121211-CB-MW-1	12/12/2011	(orig)	**0.232**	0.947	0.5	3.94
	GW-074935-121211-CB-DUP	12/12/2011	(Duplicate)	**0.244**	0.994	0.58	4.65
	GW-074935-3712-CB-MW-1	3/7/2012	(orig)	**0.0637**	0.366	0.293	2.23
	GW-074935-3712-CB-DUP	3/7/2012	(Duplicate)	**0.0693**	0.416	0.333	2.63
	GW-074935-060412-CB-MW-1	6/4/2012	(orig)	**0.956**	**2.38**	**0.919**	6.71
	GW-074935-060412-CB-DUP	6/4/2012	(Duplicate)	**0.934**	**2.26**	**0.966**	6.36
	GW-074935-091712-CM-MW-1	9/17/2012	(orig)	**0.941**	**3.51**	**0.785**	5.56
	GW-074935-091712-CM-DUP	9/17/2012	(Duplicate)	**0.984**	**3.04**	**0.852**	5.87
	GW-074935-010913-CM-MW-1	1/9/2013	(orig)	**0.125**	**1.14**	0.334	2.44
	GW-074935-010913-CM-DUP	1/9/2013	(Duplicate)	**0.142**	**1.52**	0.438	3.09
	GW-074935-031813-CM-MW-1	3/18/2013	(orig)	**0.012**	0.195	0.0871	0.581
	GW-074935-031813-CM-DUP	3/18/2013	(Duplicate)	**0.0114**	0.188	0.0891	0.575
	GW-074935-061413-JK-MW1	6/14/2013	(orig)	**0.174**	**1.41**	0.668	3.26
	GW-074935-061413-JK-DUP	6/14/2013	(Duplicate)	**0.189**	**2.02**	**0.742**	4.17
	GW-074935-091313-CM-MW-1	9/13/2013	(orig)	**0.0414**	**3.24**	0.123	4.34
	GW-074935-091313-CM-DUP	9/13/2013	(Duplicate)	**0.0372**	**3.3**	0.126	4.43
	GW-074935-121313-CM-MW-1	12/13/2013	(orig)	**0.0053**	0.188	0.122	0.681
	GW-074935-121313-CM-DUP	12/13/2013	(Duplicate)	**0.0071**	0.258	0.148	0.843
	GW-074935-032114-CK-MW-1	3/21/2014	(orig)	< 0.001	0.0348	0.0591	0.247
	GW-074935-032114-CK-DUP	3/21/2014	(Duplicate)	< 0.001	0.0385	0.0651	0.26
	GW-074935-061614-CK-MW-1	6/16/2014	(orig)	**0.133**	**1.94**	**0.994**	4.5
	GW-074935-061614-CK-DUP	6/16/2014	(Duplicate)	**0.134**	**1.92**	**0.921**	4.5
	GW-074935-091914-CB-MW-1	9/19/2014	(orig)	**0.159**	**2.34**	0.63	3.38
	GW-074935-121714-JW-MW-1	12/17/2014	(orig)	**0.0138**	0.422	0.248	1.48
	GW-074935-121714-JW-DUP	12/17/2014	(Duplicate)	**0.0137**	0.44	0.251	1.52
	GW-074935-031915-CM-MW-1	3/19/2015	(orig)	< 0.005	0.227	0.174	1.03
	GW-074935-061915-CB-MW-1	6/19/2015	(orig)	**0.025**	0.326	0.496	2.44
	GW-074935-061915-CB-DUP	6/19/2015	(Duplicate)	**0.0241**	0.306	0.472	2.31
	GW-074935-091415-CK-MW-1	9/14/2015	(orig)	**0.0339**	0.0257	0.242	0.504
	Plugged and Abandoned June 2016						
MW-1R	GW-074935-062316-SP-MW-1R	6/23/2016	(orig)	0.0026	0.002	0.0521	0.215
	GW-074935-091216-CM-MW-1R	9/23/2016	(orig)	< 0.001	< 0.001	0.191	0.518
	GW-074935-11282016-CN-MW-1R	11/28/2016	(orig)	**0.028**	0.0084	**0.901**	4.39
	GW-074635-030617-CN-MW-1R	3/6/2017	(orig)	**0.0342**	<0.020	0.333	1.940
	GW-074935-061217-CN-MW1R	6/12/2017	(orig)	**0.0162**	<0.010	0.304	0.522
	GW-11146002-092517-CN-MW-1R	9/25/2017	(orig)	**0.0126**	<0.010	0.600	1.050
	GW-11146002-120417-SP-MW-1R	12/4/2017	(dup)	**0.015**	**1.880**	**0.946**	7.960
	GW-11146002-031318-CN-MW1R	3/13/2018	(orig)	<0.050	0.505	**0.840**	4.800
	GW-11146002-062518-CM-MW-1R	6/25/2018	(orig)	<0.025	**1.010**	0.165	4.410
	GW-11146002-090418-JP-MW-1R	9/4/2018	(orig)	<0.020	0.798	<0.020	1.550
	MW-1R	12/6/2018	(orig)	<0.010	0.268	**0.922**	3.400

Table 3

Groundwater Analytical Results Summary
Hilcorp Energy Company
Charles et al. No. 1

Well ID	*Sample ID*	*Date*	*Sample Type*	*Benzene (mg/L)*	*Toluene (mg/L)*	*Ethylbenzene (mg/L)*	*Xylenes (total) (mg/L)*
NNPDWR Standards				***0.005***	***1***	***0.7***	***10***
MW-2	MW-2	6/25/2008	(orig)	0.0042	0.0046	0.0016	0.0011
	MW-2	9/25/2008	(orig)	**0.0195**	0.0258	0.0051	0.1008
	MW-2	1/13/2009	(orig)	0.0021	0.002	0.0022	0.0281
	MW-2	3/23/2009	(orig)	0.0014	0.0004	0.0006	0.0073
	MW-2	6/29/2009	(orig)	0.0015	< 0.0002	0.0002	0.0004
	MW-2	3/30/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-2	6/11/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-2	9/21/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-2	12/16/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-2	3/18/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	GW-74935-062311-PG02	6/23/2011	(orig)	0.0006	< 0.001	< 0.001	< 0.003
	GW-074935-092611-JP-010	9/26/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121211-CB-MW-2	12/12/2011	(orig)	0.00034	< 0.001	< 0.001	< 0.003
	GW-074935-3712-CB-MW-2	3/7/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-060412-CB-MW-2	6/4/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091712-CM-MW-2	9/17/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-010913-CM-MW-2	1/9/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-031813-CM-MW-2	3/18/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-061413-JK-MW-2	6/14/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091313-CM-MW-2	9/13/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121313-CM-MW-2	12/13/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-032114-CK-MW-2	3/21/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-061614-CK-MW-2	6/16/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091914-CB-MW-2	9/19/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121714-JW-MW-2	12/17/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	Plugged and Abandoned June 2016						
MW-3	MW-3	6/25/2008	(orig)	ND	ND	ND	ND
	MW-3	9/25/2008	(orig)	ND	0.0023	0.0009	0.0121
	MW-3	1/13/2009	(orig)	ND	ND	ND	ND
	MW-3	3/23/2009	(orig)	< 0.0002	0.0002	0.0002	0.0014
	MW-3	6/29/2009	(orig)	< 0.0002	0.0017	0.0007	0.0082
	MW-3	3/30/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-3	6/11/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-3	9/21/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-3	12/16/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-3	3/18/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	GW-74935-062311-PG01	6/23/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-092611-CM-006	9/26/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121211-CB-MW-3	12/12/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-3712-CB-MW-3	3/7/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-060412-CB-MW-3	6/4/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091712-CM-MW-3	9/17/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-010913-CM-MW-3	1/9/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-031813-CM-MW-3	3/18/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-061413-JK-MW-3	6/14/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091313-CM-MW-3	9/13/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121313-CM-MW-3	12/13/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-032114-CK-MW-3	3/21/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-061614-CK-MW-3	6/16/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091914-CB-MW-3	9/19/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091914-CB-DUP	9/19/2014	(Duplicate)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121714-JW-MW-3	12/17/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	Plugged and Abandoned June 2016						

Table 3

Groundwater Analytical Results Summary
Hilcorp Energy Company
Charles et al. No. 1

Well ID	*Sample ID*	*Date*	*Sample Type*	*Benzene (mg/L)*	*Toluene (mg/L)*	*Ethylbenzene (mg/L)*	*Xylenes (total) (mg/L)*
NNPDWR Standards				***0.005***	***1***	***0.7***	***10***
MW-4	MW-4	6/25/2008	(orig)	0.0038	0.0199	0.0014	0.007
	MW-4	9/25/2008	(orig)	ND	ND	ND	ND
	MW-4	1/13/2009	(orig)	ND	ND	ND	ND
	MW-4	3/23/2009	(orig)	< 0.0002	< 0.0002	< 0.0002	< 0.0002
	MW-4	6/29/2009	(orig)	< 0.0002	< 0.0002	0.0002	0.0029
	MW-4	3/30/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-4	6/11/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-4	9/21/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-4	12/16/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	MW-4	3/18/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.001
	GW-74935-062311-PG03	6/23/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-092611-SP-007	9/26/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121211-CB-MW-4	12/12/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-3712-CB-MW-4	3/7/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-060412-CB-MW-4	6/4/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-010913-CM-MW-4	1/9/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091712-CM-MW-4	9/17/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-031813-CM-MW-4	3/18/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-061413-JK-MW-4	6/14/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091313-CM-MW-4	9/13/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121313-CM-MW-4	12/13/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-032114-CK-MW-4	3/21/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-061614-CK-MW-4	6/16/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-091914-CB-MW-4	9/19/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	GW-074935-121714-JW-MW-4	12/17/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003
	Plugged and Abandoned June 2016						
MW-5	MW-5	6/26/2008	(orig)	ND	ND	ND	ND
	MW-5	9/25/2008	(orig)	ND	ND	ND	ND
	MW-5	1/13/2009	(orig)	ND	ND	ND	ND
	MW-5	3/23/2009	(orig)	ND	ND	ND	ND
	Plugged and Abandoned June 2016						
MW-6	MW-6	6/26/2008	(orig)	ND	ND	ND	ND
	MW-6	9/25/2008	(orig)	ND	ND	ND	ND
	MW-6	1/13/2009	(orig)	ND	ND	ND	ND
	MW-6	3/23/2009	(orig)	ND	ND	ND	ND
	Plugged and Abandoned June 2016						
MW-7	MW-7	6/26/2008	(orig)	ND	ND	ND	ND
	MW-7	9/25/2008	(orig)	ND	ND	ND	ND
	MW-7	3/23/2009	(orig)	ND	ND	ND	ND
	Plugged and Abandoned June 2016						

Notes:

1. MW = monitoring well
2. ND = Not Detected
3. NNPDWR = Navajo Nation Primary Drinking Water Regulations
4. mg/L = milligrams per liter (parts per million)
5. < 1.0 = Below laboratory detection limit of 1.0 mg/L
6. **Bold** = concentrations that exceed the NNEPA limits
7. Analytes sampled between 6/25/2008 and 6/29/2009 obtained by Envirotech, Inc.

Appendix A
Groundwater Laboratory Analytical Report

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

March 22, 2018

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

RE: Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

Dear Jeff Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on March 17, 2018. 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
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: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

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

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

SAMPLE SUMMARY

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60266195001	**GW-11146002-031318-CN-MW-1R**	Water	03/13/18 11:35	03/17/18 08:05

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

SAMPLE ANALYTE COUNT

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60266195001	**GW-11146002-031318-CN-MW-1R**	EPA 8260	EAG	8	PASI-K

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

Sample: GW-11146002-031318-CN-MW-1R **Lab ID: 60266195001** Collected: 03/13/18 11:35 Received: 03/17/18 08:05 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	ND	ug/L	50.0	50		03/22/18 00:35	71-43-2	
Ethylbenzene	**505**	ug/L	50.0	50		03/22/18 00:35	100-41-4	
Toluene	**840**	ug/L	50.0	50		03/22/18 00:35	108-88-3	
Xylene (Total)	**4800**	ug/L	150	50		03/22/18 00:35	1330-20-7	
Surrogates								
Toluene-d8 (S)	102	%	80-115	50		03/22/18 00:35	2037-26-5	
4-Bromofluorobenzene (S)	100	%	80-119	50		03/22/18 00:35	460-00-4	
1,2-Dichloroethane-d4 (S)	100	%	80-117	50		03/22/18 00:35	17060-07-0	
Preservation pH	**1.0**		1.0	50		03/22/18 00:35		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

QC Batch: 518569
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 60266195001

METHOD BLANK: 2122525 Matrix: Water
Associated Lab Samples: 60266195001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	03/21/18 23:10	
Ethylbenzene	ug/L	ND	1.0	03/21/18 23:10	
Toluene	ug/L	ND	1.0	03/21/18 23:10	
Xylene (Total)	ug/L	ND	3.0	03/21/18 23:10	
1,2-Dichloroethane-d4 (S)	%	103	80-117	03/21/18 23:10	
4-Bromofluorobenzene (S)	%	99	80-119	03/21/18 23:10	
Toluene-d8 (S)	%	100	80-115	03/21/18 23:10	

LABORATORY CONTROL SAMPLE: 2122526

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	17.5	87	81-118	
Ethylbenzene	ug/L	20	17.7	88	80-118	
Toluene	ug/L	20	17.6	88	82-118	
Xylene (Total)	ug/L	60	54.0	90	81-120	
1,2-Dichloroethane-d4 (S)	%			99	80-117	
4-Bromofluorobenzene (S)	%			101	80-119	
Toluene-d8 (S)	%			100	80-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2122527 2122528

Parameter	Units	60266019006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	ND	20	20	18.1	18.8	91	94	62-138	4	34	
Ethylbenzene	ug/L	ND	20	20	18.1	18.8	91	94	60-140	3	32	
Toluene	ug/L	ND	20	20	18.3	19.0	91	95	65-135	4	32	
Xylene (Total)	ug/L	ND	60	60	54.8	57.5	91	96	69-133	5	31	
1,2-Dichloroethane-d4 (S)	%						100	96	80-117			
4-Bromofluorobenzene (S)	%						101	101	80-119			
Toluene-d8 (S)	%						100	99	80-115			
Preservation pH		1.0			1.0	1.0				0	0	

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

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

QUALIFIERS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

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: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60266195

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60266195001	**GW-11146002-031318-CN-MW-1R**	EPA 8260	518569		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60266195

60266195

Client Name: GHD NM

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

Tracking #: 7801 1692 0336 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: 266 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.7 **Corr. Factor** +0.2 **Corrected** 1.9

CK

Date and initials of person examining contents: 3/21/18

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	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐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: Colleen Clyne Date: 03/21/2018

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:

Company:	GHD Services, New Mexico
Address:	6121 indian School Rd
	Albuquerque, NM 87110
Email:	jeff.walker@ghd.com
Phone:	505-884-0672 Fax:
Requested Due Date:	

Section B — Required Project Information:

Report To:	Jeff Walker
Copy To:	
Purchase Order #:	
Project Name:	11146002 Charles et al No 1
Project #:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	colleen.clyne@pacelabs.com
Pace Profile #:	10540, line 1

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: 8260 BTEX (Y/N)	Residual Chlorine (Y/N)
1	GW-11146002-031318-CN-MW-1R	WT	G	3-13-18	1135				3				3					✓	(3)DG4H 001 (3)DG4H TB 002
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			

Matrix codes: 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: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	J Walker/GHD	3-16-18	0942		3/17	0805	1.9	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Charles Neligh

SIGNATURE of SAMPLER: Charles Neligh

DATE Signed: 3-14-18

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

July 06, 2018

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

RE: Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

Dear Jeff Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on June 29, 2018. 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,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
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: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
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
Missouri Certification Number: 10090

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

SAMPLE SUMMARY

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60273824001	**GW-11146002-062518-CM-MW-1R**	Water	06/25/18 12:05	06/29/18 09:00

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60273824001	**GW-11146002-062518-CM-MW-1R**	EPA 8260	PGH	8	PASI-K

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

ANALYTICAL RESULTS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

Sample: GW-11146002-062518-CM-MW-1R **Lab ID: 60273824001** Collected: 06/25/18 12:05 Received: 06/29/18 09:00 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	ND	ug/L	25.0	25		07/05/18 19:03	71-43-2	
Ethylbenzene	**1010**	ug/L	25.0	25		07/05/18 19:03	100-41-4	
Toluene	**165**	ug/L	25.0	25		07/05/18 19:03	108-88-3	
Xylene (Total)	**4410**	ug/L	75.0	25		07/05/18 19:03	1330-20-7	
Surrogates								
Toluene-d8 (S)	99	%	80-115	25		07/05/18 19:03	2037-26-5	
4-Bromofluorobenzene (S)	98	%	80-119	25		07/05/18 19:03	460-00-4	
1,2-Dichloroethane-d4 (S)	83	%	80-117	25		07/05/18 19:03	17060-07-0	
Preservation pH	**1.0**		1.0	25		07/05/18 19:03		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

QC Batch: 533009
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 60273824001

METHOD BLANK: 2183048
Matrix: Water
Associated Lab Samples: 60273824001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	07/05/18 17:18	
Ethylbenzene	ug/L	ND	1.0	07/05/18 17:18	
Toluene	ug/L	ND	1.0	07/05/18 17:18	
Xylene (Total)	ug/L	ND	3.0	07/05/18 17:18	
1,2-Dichloroethane-d4 (S)	%	83	80-117	07/05/18 17:18	
4-Bromofluorobenzene (S)	%	101	80-119	07/05/18 17:18	
Toluene-d8 (S)	%	100	80-115	07/05/18 17:18	

LABORATORY CONTROL SAMPLE: 2183049

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	20.1	100	81-118	
Ethylbenzene	ug/L	20	21.4	107	80-118	
Toluene	ug/L	20	20.3	101	82-118	
Xylene (Total)	ug/L	60	62.6	104	81-120	
1,2-Dichloroethane-d4 (S)	%			94	80-117	
4-Bromofluorobenzene (S)	%			98	80-119	
Toluene-d8 (S)	%			100	80-115	

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

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

QUALIFIERS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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

BATCH QUALIFIERS

Batch: 533009

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60273824

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60273824001	**GW-11146002-062518-CM-MW-1R**	EPA 8260	533009		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60273824

60273824

Client Name: GHD Services

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

Tracking #: 7816 3632 7929 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: T300 **Type of Ice:** (Wet) Blue None

JLS

Cooler Temperature (°C): **As-read** 0.1 **Corr. Factor** +1.2 **Corrected** 1.3

Date and initials of person examining contents: 6/29/18 AE

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	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☒Yes ☐No ☐N/A	
Headspace in VOA vials (>6mm):	☒Yes ☐No ☐N/A	2 of 3 Trip Blank
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: Jann Chick 7/2/18 Date: _____

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:	11146002 Charles et al No 1	Pace Project Manager:	colleen.clyne@pacelabs.com
Requested Due Date:	Standard TAT	Project #:		Pace Profile #:	10540, line 1

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	8260 BTEX	Residual Chlorine (Y/N)	602 73824
1	GW-11146002-062518-CM-MW-1R	WT	G	6/25/18	1205				3				3					X	3 D6914		001
2																			3 D6914 (TB)		002
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

Matrix codes: 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			
	Christie Mathews / GHD	6/28/18	1600	UPS / Pasi	6/29/18	0900	1.3	Y	Y	Y

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:	Christie Mathews					
SIGNATURE of SAMPLER:	Christie Mathews	DATE Signed: 6/28/18				

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

September 18, 2018

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

RE: Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

Dear Jeff Walker:
Enclosed are the analytical results for sample(s) received by the laboratory on September 08, 2018. 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,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

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

Pace Analytical Services, LLC
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(913)599-5665

CERTIFICATIONS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
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
Missouri Certification Number: 10090

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SAMPLE SUMMARY

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60280038001	**GW-11146002-090418-3P-MW-1R**	Water	09/04/18 13:35	09/08/18 08:30
60280038002	**TRIP BLANK**	Water	09/04/18 08:00	09/08/18 08:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60280038001	**GW-11146002-090418-3P-MW-1R**	EPA 8260	JKL	8	PASI-K
60280038002	**TRIP BLANK**	EPA 8260	JKL	8	PASI-K

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ANALYTICAL RESULTS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

Sample: GW-11146002-090418-3P-MW-1R **Lab ID: 60280038001** Collected: 09/04/18 13:35 Received: 09/08/18 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	ND	ug/L	20.0	20		09/15/18 01:00	71-43-2	
Ethylbenzene	**798**	ug/L	20.0	20		09/15/18 01:00	100-41-4	
Toluene	ND	ug/L	20.0	20		09/15/18 01:00	108-88-3	
Xylene (Total)	**1550**	ug/L	60.0	20		09/15/18 01:00	1330-20-7	
Surrogates								
Toluene-d8 (S)	103	%	80-115	20		09/15/18 01:00	2037-26-5	
4-Bromofluorobenzene (S)	108	%	80-119	20		09/15/18 01:00	460-00-4	
1,2-Dichloroethane-d4 (S)	99	%	80-117	20		09/15/18 01:00	17060-07-0	
Preservation pH	**1.0**		1.0	20		09/15/18 01:00		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

Sample: TRIP BLANK **Lab ID: 60280038002** Collected: 09/04/18 08:00 Received: 09/08/18 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV UST, Water	Analytical Method: EPA 8260							
Benzene	ND	ug/L	1.0	1		09/15/18 01:15	71-43-2	
Ethylbenzene	ND	ug/L	1.0	1		09/15/18 01:15	100-41-4	
Toluene	ND	ug/L	1.0	1		09/15/18 01:15	108-88-3	
Xylene (Total)	ND	ug/L	3.0	1		09/15/18 01:15	1330-20-7	
Surrogates								
Toluene-d8 (S)	103	%	80-115	1		09/15/18 01:15	2037-26-5	
4-Bromofluorobenzene (S)	109	%	80-119	1		09/15/18 01:15	460-00-4	
1,2-Dichloroethane-d4 (S)	98	%	80-117	1		09/15/18 01:15	17060-07-0	
Preservation pH	**1.0**		1.0	1		09/15/18 01:15		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

QC Batch: 544630 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV UST-WATER
Associated Lab Samples: 60280038001, 60280038002

METHOD BLANK: 2231716 Matrix: Water
Associated Lab Samples: 60280038001, 60280038002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	ug/L	ND	1.0	09/15/18 00:14	
Ethylbenzene	ug/L	ND	1.0	09/15/18 00:14	
Toluene	ug/L	ND	1.0	09/15/18 00:14	
Xylene (Total)	ug/L	ND	3.0	09/15/18 00:14	
1,2-Dichloroethane-d4 (S)	%	98	80-117	09/15/18 00:14	
4-Bromofluorobenzene (S)	%	110	80-119	09/15/18 00:14	
Toluene-d8 (S)	%	105	80-115	09/15/18 00:14	

LABORATORY CONTROL SAMPLE: 2231717

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Benzene	ug/L	20	16.9	85	81-118	
Ethylbenzene	ug/L	20	17.9	90	80-118	
Toluene	ug/L	20	18.4	92	82-118	
Xylene (Total)	ug/L	60	51.5	86	81-120	
1,2-Dichloroethane-d4 (S)	%			97	80-117	
4-Bromofluorobenzene (S)	%			104	80-119	
Toluene-d8 (S)	%			104	80-115	

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

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

QUALIFIERS

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

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 - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

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

BATCH QUALIFIERS

Batch: 544630

[M5] A matrix spike/matrix spike duplicate was not performed for this batch due to insufficient sample volume.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 11146002 CHARLES ET AL NO 1
Pace Project No.: 60280038

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60280038001	**GW-11146002-090418-3P-MW-1R**	EPA 8260	544630		
60280038002	**TRIP BLANK**	EPA 8260	544630		

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Sample Condition Upon Receipt

JLS

WO# : 60280038

60280038

Client Name: GHD

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

Tracking #: 7826 8003 8728 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: T298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.7 **Corr. Factor** 0.0 **Corrected** 1.7

Date and initials of person examining contents: JDE 9-8-18

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	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐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: _____

Jann Chunk 9/10/18

Project Manager Review: _____ Date: _____

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:	11146002 Charles et al No 1	Pace Project Manager:	colleen.clyne@pacelabs.com
Requested Due Date:		Project #:		Pace Profile #:	10540, line 1

Regulatory Agency	
State / Location	NM

SAMPLE ID
One Character per box.
(A-Z, 0-9 / , -)
Sample Ids must be unique

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	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	Requested Analysis Filtered (Y/N) Y/N	Analyses Test	Residual Chlorine (Y/N)	
1	GW-11146002-090418-JP-MW-[redacted]-1R		G	9.4.18	1335				3				✓					✓	8260 BTEX		001
2																			DG9H(3)		002
3																			DG9H(3)(TB)		
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	[signature]	9.7.18	1300	[signature] PACE	9-8-18	0830	1.7 Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Josh Pigg, Charles Neleigh

SIGNATURE of SAMPLER: [signature] DATE Signed: 9-7-18

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

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 18, 2018

HilCorp-Farmington, NM

Sample Delivery Group:	L1052211
Samples Received:	12/12/2018
Project Number:	
Description:	Charles et al No. 1
Site:	CHARLESETAL #1
Report To:	Jennifer Deal 382 Road 3100 Aztec, NM 87401

Entire Report Reviewed By: Daphne R Richards

Daphne Richards
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-1R L1052211-01 GW

Collected by	Collected date/time	Received date/time
Kurt	12/06/18 11:35	12/12/18 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1210893	10	12/14/18 14:43	12/14/18 14:43	DWR
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1211680	50	12/17/18 00:48	12/17/18 00:48	BMB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Daphne R Richards

Daphne Richards
Project Manager

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.0100	10	12/14/2018 14:43	WG1210893
Toluene	0.268		0.0100	10	12/14/2018 14:43	WG1210893
Ethylbenzene	0.922		0.0100	10	12/14/2018 14:43	WG1210893
Total Xylenes	3.40		0.150	50	12/17/2018 00:48	WG1211680
(S) Toluene-d8	*102*		*80.0-120*		*12/14/2018 14:43*	WG1210893
(S) Toluene-d8	*99.2*		*80.0-120*		*12/17/2018 00:48*	WG1211680
(S) Dibromofluoromethane	*121*	J1	*75.0-120*		*12/14/2018 14:43*	WG1210893
(S) Dibromofluoromethane	*101*		*75.0-120*		*12/17/2018 00:48*	WG1211680
(S) a,a,a-Trifluorotoluene	*115*		*80.0-120*		*12/14/2018 14:43*	WG1210893
(S) a,a,a-Trifluorotoluene	*99.4*		*80.0-120*		*12/17/2018 00:48*	WG1211680
(S) 4-Bromofluorobenzene	*103*		*77.0-126*		*12/14/2018 14:43*	WG1210893
(S) 4-Bromofluorobenzene	*116*		*77.0-126*		*12/17/2018 00:48*	WG1211680

Sample Narrative:

L1052211-01 WG1210893: Surrogate fails high due to matrix interference.

Method Blank (MB)

(MB) R3368571-4 12/14/18 11:17

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.000331	0.00100
Ethylbenzene	U		0.000384	0.00100
Toluene	U		0.000412	0.00100
(S) Toluene-d8	*99.2*			*80.0-120*
(S) Dibromofluoromethane	*112*			*75.0-120*
(S) 4-Bromofluorobenzene	*97.1*			*77.0-126*
(S) a,a,a-Trifluorotoluene	*110*			*80.0-120*

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

(LCS) R3368571-1 12/14/18 09:26 • (LCSD) R3368571-2 12/14/18 09:46

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	0.0250	0.0242	0.0238	96.8	95.2	70.0-123			1.73	20
Ethylbenzene	0.0250	0.0241	0.0240	96.4	96.1	79.0-123			0.344	20
Toluene	0.0250	0.0224	0.0206	89.6	82.4	79.0-120			8.31	20
(S) Toluene-d8				*108*	*93.5*	*80.0-120*				
(S) Dibromofluoromethane				*117*	*115*	*75.0-120*				
(S) 4-Bromofluorobenzene				*95.9*	*95.1*	*77.0-126*				
(S) a,a,a-Trifluorotoluene				*104*	*109*	*80.0-120*				

Method Blank (MB)

(MB) R3368968-4 12/16/18 16:53

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Xylenes, Total	U		0.00106	0.00300
(S) Toluene-d8	*96.7*			*80.0-120*
(S) Dibromofluoromethane	*97.8*			*75.0-120*
(S) 4-Bromofluorobenzene	*112*			*77.0-126*
(S) a,a,a-Trifluorotoluene	*88.5*			*80.0-120*

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

(LCS) R3368968-1 12/16/18 15:34 • (LCSD) R3368968-3 12/16/18 16:14

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Xylenes, Total	0.0750	0.0651	0.0620	86.8	82.7	79.0-123			4.88	20
(S) Toluene-d8				*98.0*	*99.5*	*80.0-120*				
(S) Dibromofluoromethane				*103*	*96.0*	*75.0-120*				
(S) 4-Bromofluorobenzene				*110*	*124*	*77.0-126*				
(S) a,a,a-Trifluorotoluene				*98.1*	*92.7*	*80.0-120*				

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

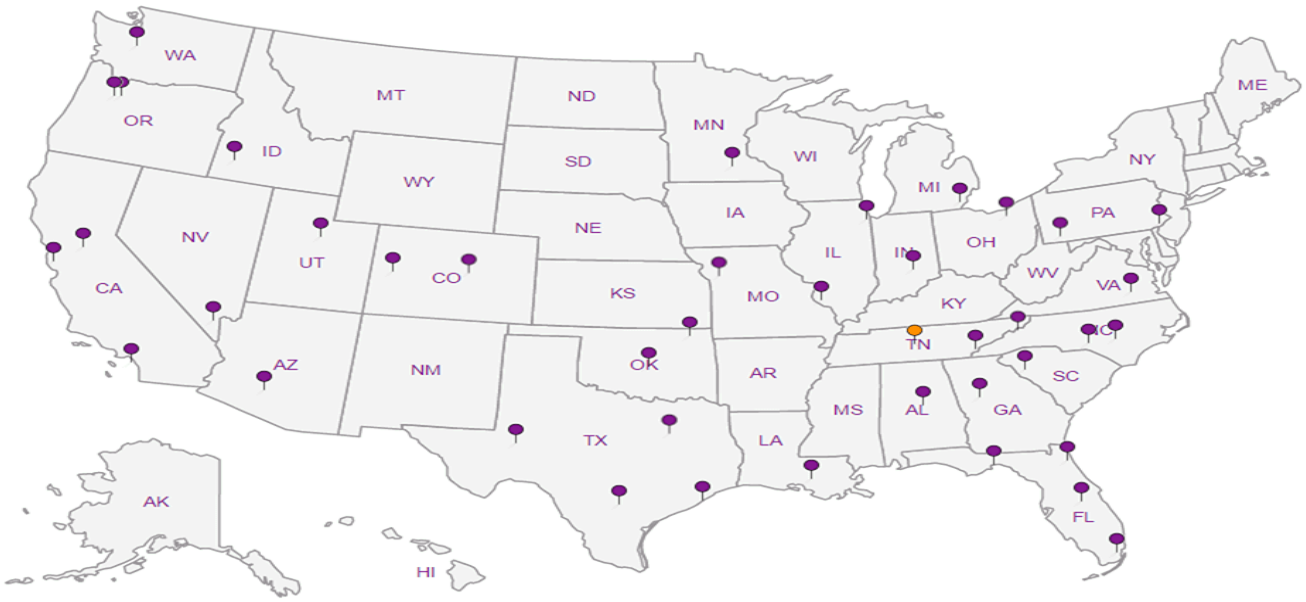
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



HilCorp-Farmington, NM

382 Road 3100
Aztec, NM 87401

Billing Information:

PO Box 61529
Houston, TX 77208

Report to: Kurt Hoekstra

Email To: khoekstra@hilcorp.com ccardoza@hilcorp.com

Project Description:

City/State Collected:

Phone: 505-486-9543
Fax:

Client Project #

Lab Project # HILCORANM-HOEKSTRA

Collected by (print): Kurt

Site/Facility ID # CHARLES #1

P.O. #

Collected by (signature): Kurt Hoekstra

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day X Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	V8260BTEX 40mlAmb-HCl										Remarks	Sample # (lab only)
MW-1R		GW	4.04	12-6	11:35	3	X											-01
		GW				3	X											

Chain of Custody Page ___ of ___

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1052211

F196

Acctnum: HILCORANM
Template: T142957
Prelogin: P680904
TSR: 288 - Daphne Richards
PB: 11-14-18

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS V FedEx __ Courier __ _____

Tracking # 4624 3005 1575

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

RAD SCREEN: <0.5 mR/hr

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Kurt Hoekstra	12-11-18	7:35	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 0.7+0.3=1.0 °C Bottles Received: 3VB

Date: 12/12/18 Time: 830

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK