Review of 2020 Annual Groundwater Report: Content satisfactory

1. Continue annual monitoring and sampling for groundwater quality in 2021
2. Submit the Annual Monitoring Report to the OCD no later than March 31, 2022

Hilcorp

March 11, 2021

Mr. Cory Smith
New Mexico Oil Conservation Division
1000 Rio Brazos Road
Aztec, NM 87410

RE: 2020 Annual Groundwater Report
Hilcorp Energy Company
Johnston Federal 4 – 3RP-071
Incident # - NAUTOFAB000417
San Juan County, New Mexico

Dear Mr. Smith:

Hilcorp Energy Company (Hilcorp) presents the following annual report discussing ground water monitoring activities conducted at the Johnston Federal 4 metering station (Site) during 2020. Ground water was impacted by an earthen tank drain pit. Hilcorp acquired the Site from ConocoPhillips in April 2017 which has four monitoring wells. El Paso CGP Company (El Paso) is a co-producer on the Site well pad and owns additional Site monitoring wells, from which non-aqueous phase liquid, or free product, is being recovered. El Paso groundwater impacts are down gradient from the Hilcorp monitoring wells.

The Site consists of a natural gas well and associated equipment and is located approximately 1.5 miles to the southwest of the metering station. The Site is located on both Bureau of Land Management (BLM) and private land, approximately 13 miles east-northeast of Aztec, San Juan County, NM in Unit Letter M, Section 27, Township 31N, Range 9W (Figure 1). A detailed Site Plan is provided as Figure 2. A full history of this site can be found in the annual reports previously submitted.

Methodology

On August 12 & 13, 2020, groundwater elevation measurements were obtained for monitoring wells MW-1 through MW-4 using an oil/water interface probe. Light non-aqueous phase liquid (LNAPL) was measured at a thickness of 0.19 feet in MW-1. LNAPL was last measured in MW-1 in 2019 at a thickness of 0.19 feet. The 2020 annual groundwater gauging data, historical elevations and LNAPL thicknesses are summarized in Table 1.

All sampled monitoring wells were purged of approximately three well casing columns while temperature, pH, conductivity, dissolved oxygen and oxidation-reduction potential were measured. Groundwater samples were collected using clean disposable bailers and decanted into clean containers supplied by the analytical laboratory. All samples were submitted under chain of custody to PACE Analytical in Mount Juliet, TN and analyzed for BTEX by method 8260B, for sulfate by method 9056A and for dissolved manganese by method 6010B. Groundwater gauging and parameter data are presented in Tables 1 & 2, respectively.

Groundwater Gradient

Based on subsurface groundwater investigations conducted at the Site, the depth to groundwater is approximately 45 feet bgs. Groundwater flowed to the east with a gradient of 0.016ft/ft (Figure 3). Wells gauged in August 2020 indicated a decrease in elevation of the potentiometric surface with an average decrease of 0.08 feet from the 2019 event. A Groundwater Potentiometric Surface Map is presented as Figure 3.

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Results

During the August 2020 groundwater monitoring event, BTEX constituents were not detected above the laboratory reporting limits in groundwater samples collected from MW-2 and MW-3. The groundwater sample from MW-1 detected BTEX at concentrations above NMWQCC standards for these constituents. The groundwater sample from MW-4 detected benzene at a concentration above the NMWQCC standard for this constituent. Concentrations of sulfate were detected above the NMWQCC standard in MW-2 and MW-4. Dissolved manganese was detected above the NMWQCC standard in MW-1, MW-3 and MW-4.

Analytical results for groundwater samples collected from the Site during August 2020 sampling event and historical analytical results are summarized in Table 3. An August 2020 Benzene concentration Map is presented as Figure 4. Analytical reports and chain of custody documentation are presented in Attachment A.

Conclusions/Recommendations

Based on 2020 quarterly monitoring results,

- Groundwater flowed to the east with a gradient of 0.016ft/ft
- Monitoring wells gauged in August 2020 indicated a decrease in the elevation of the potentiometric surface of 0.08ft as compared to 2019 gauging data
- BTEX constituent concentrations were not detected above the laboratory reporting limits in two groundwater samples collected from MW-2 & MW-3
- Benzene concentrations were detected above the NMWQCC cleanup levels in the groundwater sample collected at MW-4
- Concentrations of BTEX constituents in dissolved phase groundwater in MW-1 were detected above NMWQCC standards but were considered little changed compared to 2019 sample results
- Sulfate concentrations were detected above the laboratory reporting limits, but below the NMWQCC cleanup levels in the groundwater sample collected from MW-1 and MW-3 and above the NMWQCC cleanup levels in MW-2 and MW-4
- Concentrations of dissolved manganese were detected above NMWQCC groundwater quality standards in groundwater of MW-1, MW-3 and MW-4 and below the standard in MW-2

Because historical data support that the plum of groundwater impacts is stable, Hilcorp recommends the continuation of annual monitoring for groundwater quality at the Site for 2021.

If you have any questions or comments regarding this report, do not hesitate to contact me at (505) 324-5128 or by email Jdeal@hilcorp.com.

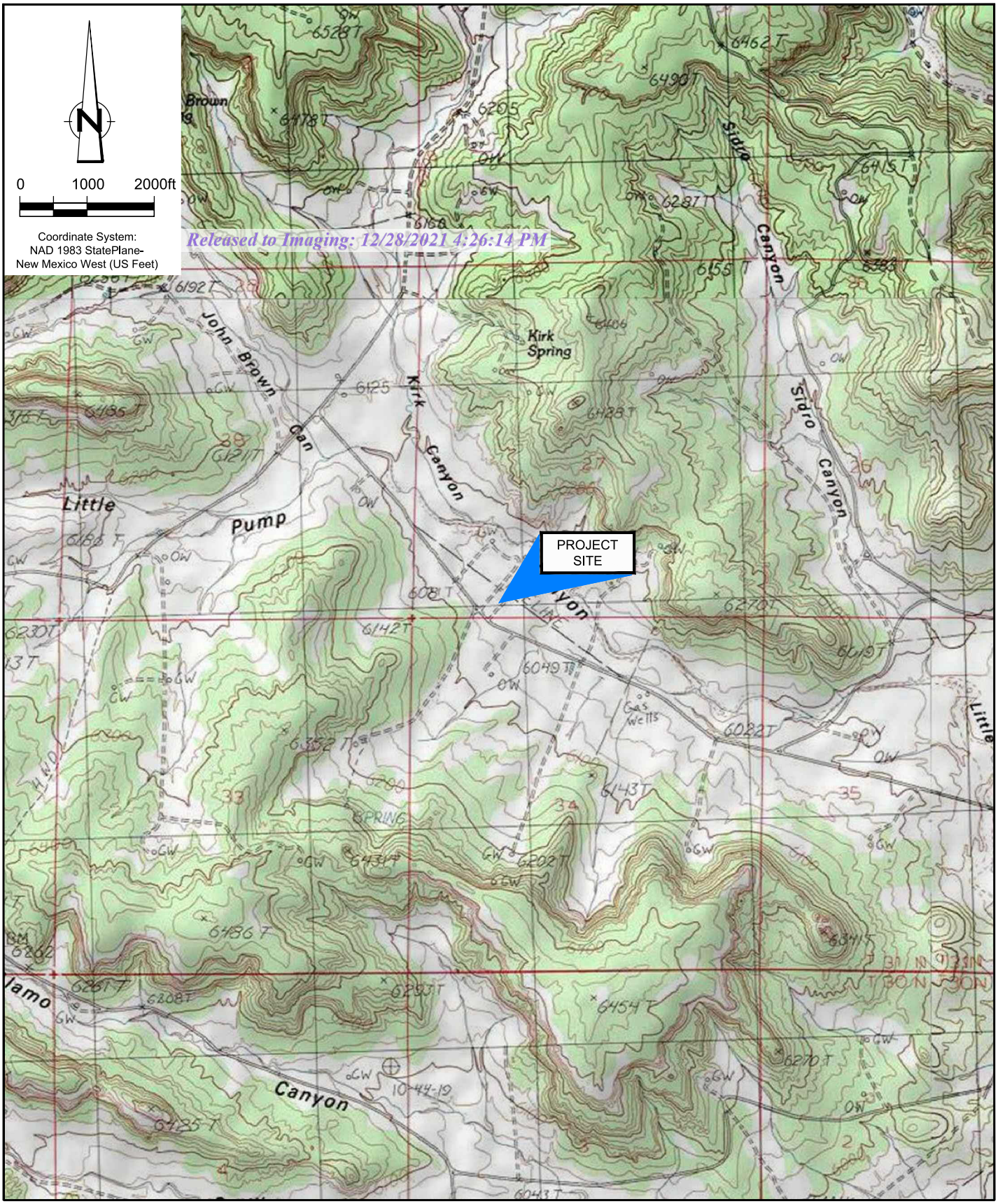
Kind Regards,

Jennifer Deal

Jennifer Deal
Environmental Specialist
Hilcorp Energy Company – L48 West

Attachments:

Figures 1-4
Tables 1 – 3
Attachment A – Analytical Reports



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

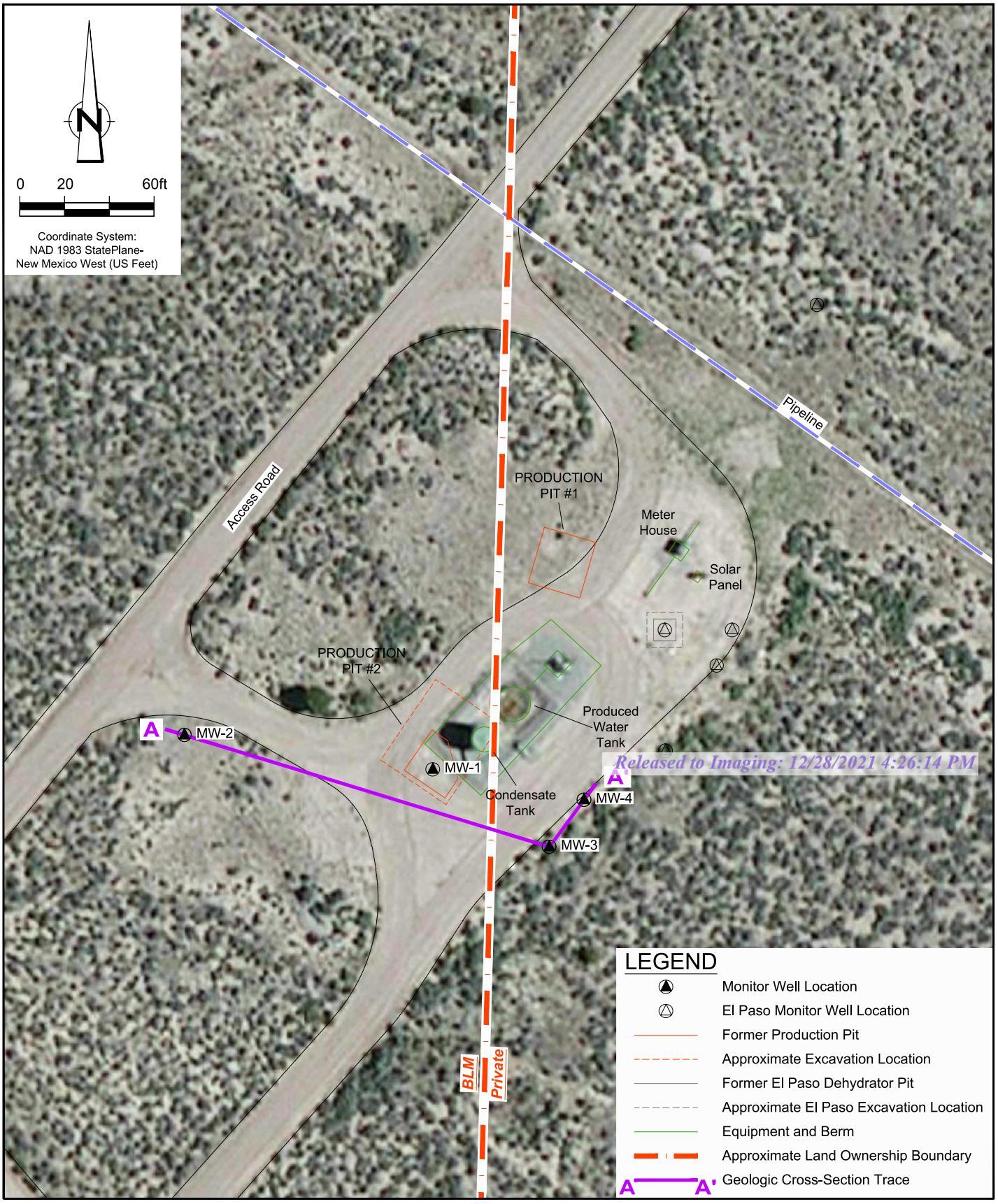
Lat/Long: 36.8626° North, 107.7723° West

HILCORP ENERGY COMPANY
SECTION 27, T31N-R09W, SAN JUAN COUNTY, NEW MEXICO
JOHNSTON FEDERAL No. 4 METERING STATION

11207485-3MN00

SITE LOCATION MAP

FIGURE 1



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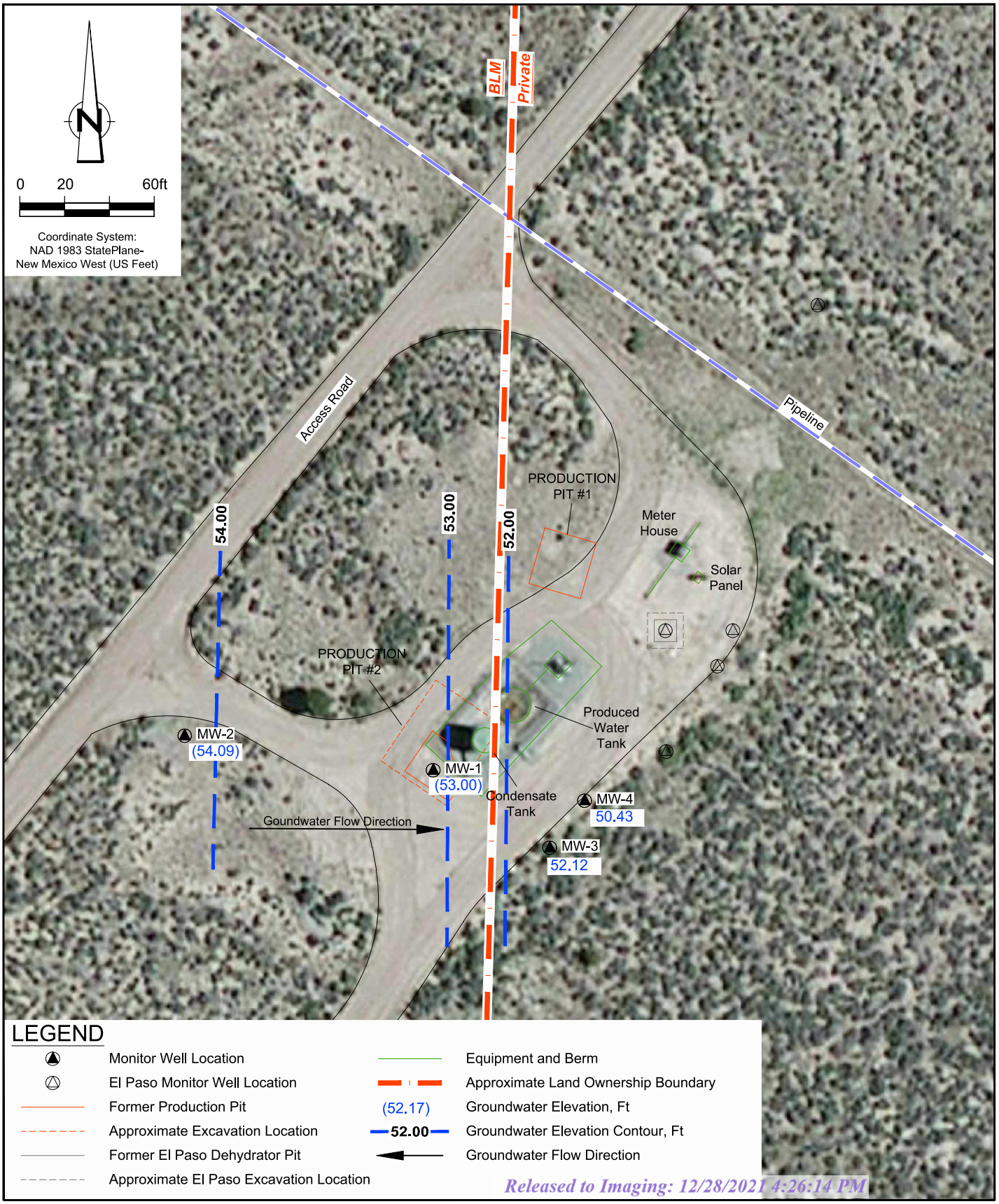
SECTION 27, T31N-R09W, SAN JUAN COUNTY, NEW MEXICO
JOHNSTON FEDERAL No. 4 METERING STATION

11145957-2MN00

Sep 21, 2018

SITE PLAN

FIGURE 2



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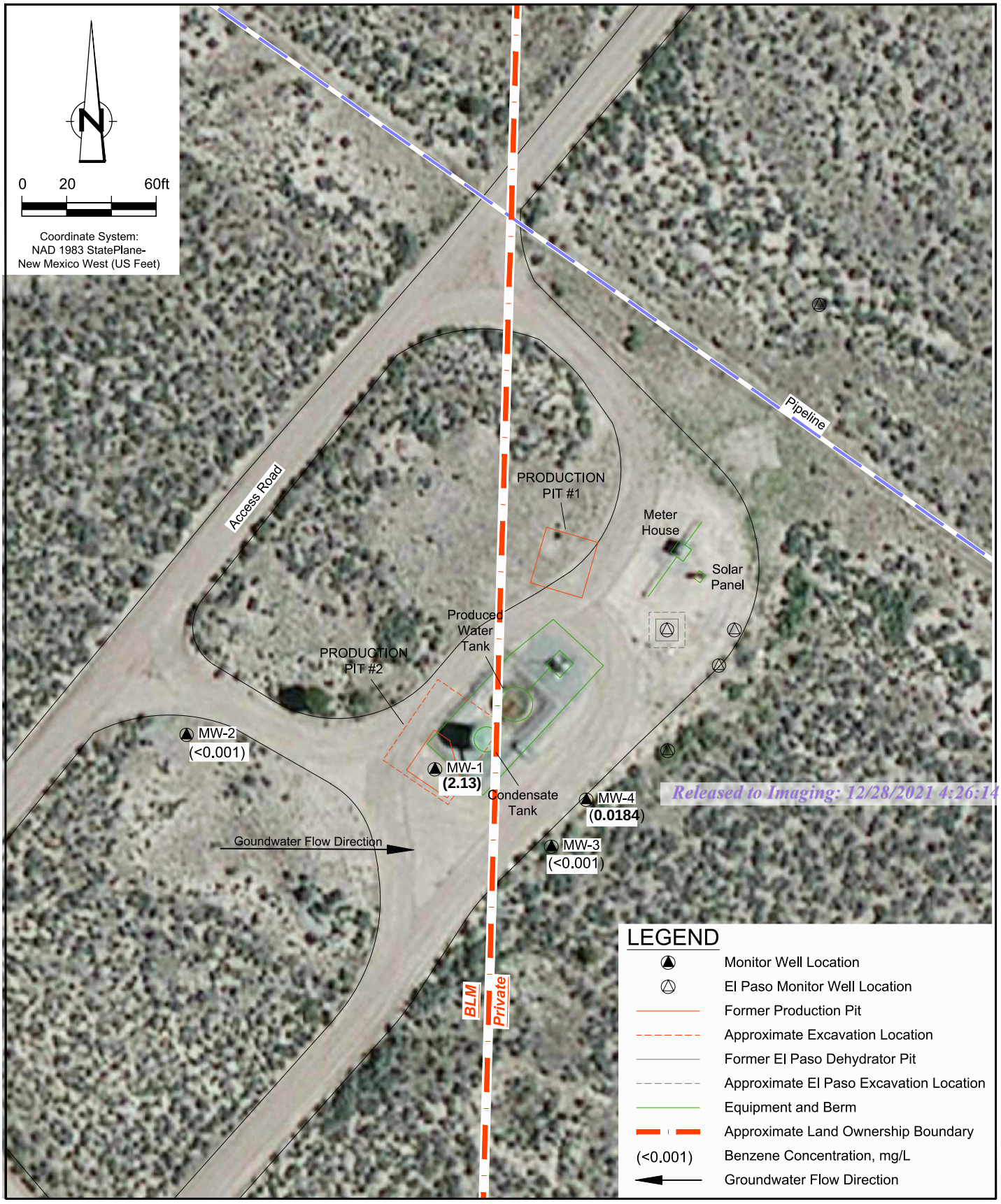
JOHNSTON FEDERAL No. 4 METERING STATION

AUGUST 2020
GROUNDWATER POTENTIOMETRIC SURFACE MAP

FIGURE 3



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JOHNSTON FEDERAL No. 4 METERING STATION

AUGUST 2020
BENZENE CONCENTRATION MAP

FIGURE 4

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Top of Casing Elevation (1)	Screened Interval (ft bgs)	Sample Date	Depth to PSH (ft BTOC)	Depth to Groundwater (ft BTOC)	PSH Thickness (ft)	Adjusted Groundwater Elevation (2)
MW-1	51.79	100	35 - 50	5/25/1999	--	NM	--	NM
				9/1/1999	--	47.02	--	52.98
				12/1/1999	--	46.96	--	53.04
				1/18/2000	--	44.05	--	55.95
				5/17/2000	--	46.90	--	53.10
				9/8/2000	--	46.91	--	53.09
				12/20/2000	--	46.88	--	53.12
				3/27/2001	--	NM	--	NM
				6/27/2001	--	47.05	--	52.95
				9/17/2001	--	46.93	--	53.07
				12/19/2001	--	46.97	--	53.03
				3/25/2002	--	46.99	--	53.01
				6/25/2002	--	47.01	--	52.99
				9/24/2002	--	46.98	--	53.02
				12/30/2002	--	47.40	--	52.60
				3/27/2003	--	NM	--	NM
				6/27/2003	--	NM	--	NM
				10/10/2003	--	NM	--	NM
				12/10/2003	--	NM	--	NM
				3/16/2004	--	47.28	--	52.72
				6/22/2004	--	47.06	--	52.94
				9/30/2004	--	47.24	--	52.76
				12/13/2004	--	47.14	--	52.86
				3/23/2005	--	46.91	--	53.09
				6/22/2005	--	46.93	--	53.07
				10/28/2005	--	46.87	--	53.13
				12/14/2005	--	46.72	--	53.28
				3/20/2006	--	46.75	--	53.25
				6/21/2006	--	46.84	--	53.16
				10/20/2006	--	46.89	--	53.11
				12/13/2006	--	46.92	--	53.08
				11/9/2007	--	NM	--	NM
				1/15/2008	--	NM	--	NM
				4/30/2008	--	46.45	--	53.55
				7/23/2008	--	46.63	--	53.37
				10/24/2008	--	46.60	--	53.40
				1/29/2009	--	46.57	--	53.43
				4/23/2009	--	46.40	--	53.60
				9/25/2009	--	46.52	--	53.48
				9/22/2010	--	46.60	--	53.40
				9/28/2011	--	46.65	--	53.35
				9/26/2012	--	46.80	--	53.20
				9/17/2013	--	46.88	--	53.12
				9/23/2014	--	46.94	--	53.06
				12/17/2014	--	46.94	--	53.06
				1/8/2015	--	46.92	--	53.08
				6/18/2015	--	46.94	--	53.06
				9/22/2015	--	46.91	--	53.09
				9/14/2016	46.70	46.71	0.01	53.29
				9/27/2017	--	46.78	--	53.22
				9/6/2018	--	46.79	--	53.21
				8/12/2019	46.77	46.87	0.10	53.13
				8/12/2020	46.81	47.00	0.19	53.00

Well ID	Total Depth (ft)	Top of Casing Elevation (1)	Screened Interval (ft bgs)	Sample Date	Depth to PSH (ft BTOC)	Depth to Groundwater (ft BTOC)	PSH Thickness (ft)	Adjusted Groundwater Elevation (2)
MW-2	65.5	97.71	41.5 - 61.5	10/24/2008	--	42.85	--	54.86
				1/29/2009	--	42.83	--	54.88
				4/23/2009	--	42.75	--	54.96
				9/25/2009	--	42.82	--	54.89
				9/22/2010	--	43.01	--	54.70
				9/28/2011	--	43.14	--	54.57
				9/26/2012	--	43.33	--	54.38
				9/17/2013	--	43.51	--	54.20
				9/23/2014	--	43.56	--	54.15
				12/17/2014	--	43.59	--	54.12
				6/18/2015	--	43.57	--	54.14
				9/22/2015	--	43.58	--	54.13
				9/14/2016	--	43.51	--	54.20
				9/27/2017	--	43.56	--	54.15
				9/6/2018	--	43.50	--	54.21
				8/15/2019	--	43.56	--	54.15
				8/12/2020	--	43.62	--	54.09
MW-3	59	94.65	35 - 55	10/24/2008	--	43.91	--	50.74
				1/29/2009	--	41.97	--	52.68
				4/23/2009	--	41.87	--	52.78
				9/25/2009	--	42.04	--	52.61
				9/22/2010	--	42.17	--	52.48
				9/28/2011	--	42.22	--	52.43
				9/26/2012	--	42.36	--	52.29
				9/17/2013	--	42.47	--	52.18
				9/23/2014	--	42.70	--	51.95
				12/17/2014	--	42.62	--	52.03
				6/18/2015	--	43.67	--	50.98
				9/22/2015	--	42.65	--	52.00
				9/14/2016	--	42.47	--	52.18
				9/27/2017	--	42.54	--	52.11
				9/6/2018	--	42.45	--	52.20
				8/12/2019	--	42.48	--	52.17
				8/12/2020	--	42.53	--	52.12
MW-4	61	94.79	37 - 57	10/24/2008	--	43.11	--	51.68
				1/29/2009	--	43.11	--	51.68
				4/23/2009	--	43.06	--	51.73
				9/25/2009	--	43.20	--	51.59
				9/22/2010	--	43.39	--	51.40
				9/28/2011	--	43.45	--	51.34
				9/26/2012	--	43.57	--	51.22
				9/17/2013	--	43.65	--	51.14
				9/23/2014	--	44.81	--	49.98
				12/17/2014	--	44.80	--	49.99
				6/18/2015	--	45.85	--	48.94
				9/22/2015	--	44.73	--	50.06
				9/14/2016	--	44.16	--	50.63
				9/27/2017	--	44.15	--	50.64
				9/6/2018	--	44.00	--	50.79
				8/16/2019	--	44.27	--	50.52
				8/13/2020	--	44.36	--	50.43

Notes:
(1) - surface elevation based on an arbitrary datum of 100 feet based on top of casing of MW-1
(2) - when PSH is present, groundwater elevation is adjusted using a PSH density correction factor of 0.8
bgs - below ground surface
BTOC - below top of casing
ft = feet
NM = Not measured
PSH - phase separated hydrocarbons

TABLE 2
FIELD PARAMETER RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Volume (gallons)
MW-1		No parameters collected due to LNAPL sheen.						
	6/18/2015	No parameters collected due to LNAPL sheen.						
	9//22/2015	No parameters collected due to LNAPL sheen.						
	9/14/2016	No parameters collected due to LNAPL sheen.						
	9/27/2017	14.06	6.55	--	1,662	--	--	0.80
	9/6/2018	16.45	7.32	--	1,797	0.80	-349.5	2.50
	8/12/2019	20.00	7.40	0.99	--	4.80	-11.3	
	8/12/2020	24.90	7.01	1.02	2,160	0.13	-18.9	0.19
MW-2	9/23/2014	15.00	7.22	1.50	2,310	11.30	57.0	9.50
	9/23/2014	14.80	7.18	1.50	2,360	10.89	63.0	10.00
	9/23/2014	14.80	7.17	1.50	2,360	10.70	67.0	10.50
	9/22/2015	13.95	7.62	0.80	1,235	12.50	59.2	9.00
	9/22/2015	13.69	6.98	1.48	2,276	5.62	82.6	9.50
	9/22/2015	13.55	6.64	1.48	2,273	5.05	93.0	10.00
	9/14/2016	13.53	7.26	1.53	2,368	5.10	6.9	10.00
	9/27/2016	12.52	7.13	--	1,884	--	--	3.32
	9/6/2018	--	--	--	--	--	--	9.50
	8/15/2019	19.80	7.35	1.05	--	54.60	-45.8	
	8/12/2020	18.90	6.45	1.02	2,060	2.72	-24.2	
MW-3	9/23/2014	15.70	7.01	1.20	1,820	10.13	-104.0	6.25
	9/23/2014	15.70	7.01	1.20	1,840	9.12	-127.0	6.75
	9/23/2014	15.70	7.01	1.20	1,850	8.48	-137.0	7.25
	12/17/2014	14.76	7.48	1.38	2,123	2.40	-149.1	5.75
	12/17/2014	14.72	7.48	1.40	2,158	2.66	-159.7	6.25
	12/17/2014	14.78	7.49	1.44	2,218	2.39	-164.0	6.75
	9/22/2015	15.11	7.71	0.74	1,130	9.05	5.7	6.25
	9/22/2015	15.07	7.50	1.32	2,032	4.70	-53.7	6.75
	9/22/2015	15.07	7.32	1.31	2,021	2.34	-79.2	7.25
	9/14/2016	14.91	7.21	1.21	1,856	2.01	-158.8	7.00
	9/27/2017	13.91	6.79	--	1,534	--	--	2.40
	9/6/2018	17.17	7.36	--	1,637	1.15	-68.7	7.50
	8/12/2019	20.10	7.24	0.38	--	29.70	7.2	
	8/12/2020	22.20	6.47	0.50	1,020	1.66	2.6	

Well ID	Sample Date	Temperature (°C)	pH	TDS (mg/L)	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Volume (gallons)
MW-4	9/23/2014	16.40	6.65	1.40	2,130	10.81	-124.0	3.50
	9/23/2014	16.00	6.72	1.40	2,110	9.17	-136.0	4.00
	9/23/2014	15.80	6.77	1.30	2,110	8.42	-142.0	4.50
	9/23/2014	15.90	6.81	1.30	2,110	8.10	-150.0	5.00
	12/17/2014	14.79	7.22	1.51	2,320	4.74	-145.4	6.25
	12/17/2014	14.91	7.35	1.51	2,324	3.70	-158.7	6.75
	12/17/2014	14.98	7.37	1.51	2,323	2.94	-166.6	7.25
	6/18/2015	15.65	6.67	1.42	2,186	2.52	-133.8	6.00
	6/18/2015	15.49	6.68	1.42	2,184	2.44	-130.2	6.25
	6/18/2015	15.38	6.71	1.42	2,183	2.20	-129.3	6.50
	6/18/2015	15.38	6.72	1.42	2,182	2.21	-146.6	6.75
	6/18/2015	15.37	6.73	1.42	2,184	2.05	-140.1	7.00
	9/22/2015	15.17	7.15	1.33	2,042	2.45	-105.6	6.50
	9/22/2015	15.14	6.89	1.33	2,043	2.07	-12.5	7.00
	9/22/2015	15.13	6.82	1.33	2,041	2.04	-126.5	7.50
	9/14/2016	14.92	7.23	1.36	2,096	7.69	-205.4	5.00
	9/27/2017	14.01	6.95	--	1,671	--	--	2.52
	9/6/2018	--	--	--	--	--	--	3.25
	8/16/2019	18.10	7.21	0.90	--	16.50	-22.5	
	8/13/2020	20.80	6.72	0.89	1,770	1.66	2.6	

Notes:

mg/L - milligrams per liter

uS/cm - microsiemens per centimeter

mg/L - milligrams per liter

°C - degrees Celcius

DO - dissolved oxygen

mV - millivolts

ORP - oxidation-reduction potential

TDS - total dissolved solids

-- - data not collected

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

JOHNSTON FEDERAL #4
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Naphthalene	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)
NMWQCC Standards				0.010	0.75	0.75	0.62	0.03	1.0	0.20	600
MW-1	MW-1	5/25/1999	(orig)	8.7	2.9	2.8	2.9	--	--	--	--
	MW-1	12/1/1999	(orig)	4.7	1.3	0.9	10	--	--	--	--
	MW-1	1/18/2000	(orig)	3.6	0.82	0.84	7.5	--	--	--	--
	MW-1	5/17/2000	(orig)	6.9	1.1	1.5	17	--	--	--	--
	MW-1	9/8/2000	(orig)	4.6	0.62	0.93	10	--	--	--	--
	MW-1	12/20/2000	(orig)	< 0.0002	0.0005	0.034	0.061	--	--	--	--
	MW-1	3/27/2001	(orig)	5.43	0.641	0.991	9.83	--	--	--	--
	MW-1	6/27/2001	(orig)	5.87	0.9	0.99	10.4	--	--	--	--
	MW-1	9/17/2001	(orig)	5.91	0.75	0.98	10.7	--	--	--	--
	MW-1	12/19/2001	(orig)	7.2	0.65	1.02	11.3	--	--	--	--
	MW-1	3/25/2002	(orig)	5.52	0.83	1.19	10.5	--	--	--	--
	MW-1	6/26/2002	(orig)	0.516	0.0662	0.0787	0.863	--	--	--	--
	MW-1	9/24/2002	(orig)	5.31	8	0.88	13.96	--	--	--	--
	MW-1	12/30/2002	(orig)	7.66	10.2	0.76	14.14	--	--	--	--
	MW-1	6/22/2004	(orig)	6.16	8.1	0.47	15.84	--	--	--	--
	MW-1	3/20/2006	(orig)	3.17	3.74	1.06	30.13	--	--	--	--
	MW-1	6/21/2006	(orig)	4.9	3.28	0.448	2.39	--	--	--	--
	MW-1	12/13/2006	(orig)	5.3	7.2	0.87	15.45	--	--	--	--
	MW-1	3/27/2007	(orig)	6.87	5.72	0.21	12.16	--	--	--	--
	MW-1	6/25/2007	(orig)	5.68	1.83	0.4	9.48	--	--	--	--
	MW-1	4/30/2008	(orig)	6.3	1.8	0.28 J	8.6	--	--	--	--
	MW-1	7/23/2008	(orig)	7.1	2.2	0.45	10.6	--	--	--	--
	MW-1	10/24/2008	(orig)	6	2.1	0.4	9.0	0.044	--	--	--
	MW-1	1/29/2009	(orig)	6.7	2.2	0.63	14.5	0.061	--	--	315
	MW-1	9/25/2009	(orig)	3.9	1.5	0.68	9.8	0.04	< 0.02	1.11	429
	MW-1	9/22/2010	(orig)	3.5	0.98	0.63	7.5	0.049	--	0.752	190
	GW-074925-092811-CM-004	9/28/2011	(orig)	3.36	1.05	0.667	6.81	0.037	< 0.05	0.774	202
	GW-074925-092811-CM-005	9/28/2011	(Duplicate)	3.43	1.12	0.779	8.29	--	--	--	--
	GW-074925-092612-CM-MW-1	9/26/2012	(orig)	3.07	0.599	0.577	5.16	0.0398	< 0.05	0.67	113
	August 2013 Mobile Dual Phase Extraction Event										
	GW-074925-091713-CM-MW-1	9/17/2013	(orig)	4.69	7.55	1.17	9.0	0.0365	< 0.05	0.89	371
	GW-074925-091713-CM-DUP	9/17/2013	(Duplicate)	4.7	7.21	1.04	9.97	--	--	--	--
	GW-074925-092314-SP-MW-1	9/23/2014	(orig)	2.97	4.25	0.778	6.89	0.0446	<0.050	0.85	155
	GW-074925-092314-SP-DUP	9/23/2014	(Duplicate)	2.82	3.88	0.754	6.69	--	--	--	--
	November 2014 Mobile Dual Phase Extraction Event										
	GW-074925-010815-JW-MW-1	1/8/2015	(orig)	4.35	6.15	1.07	10.0	0.0787	--	--	--
	GW-074925-061815-CB-MW-1	6/18/2015	(orig)	4.05	6.26	1.04	10.8	0.0625	--	--	--
	GW-074925-061815-CB-DUP	6/18/2015	(Duplicate)	4.34	6.46	0.933	11.1	--	--	--	--

Well ID	Sample ID	Sample Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Naphthalene	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)
NMWQCC Standards				0.010	0.75	0.75	0.62	0.03	1.0	0.20	600
	April 2015 Mobile Dual Phase Extraction Event										
	GW-074925-092215-CB-MW-1	9/22/2015	(orig)	3.36	4.57	0.741	8.62	0.0504	< 0.050	0.72	44.2
	GW-074925-092215-CB-DUP	9/22/2015	(Duplicate)	3.37	4.28	0.724	7.98	--	--	--	--
		9/14/2016	Not sampled due to presense of LNAPL								
	GW-11145957-092717-SP-MW-1	9/27/2017	(orig)	2.34	2.86	0.949	9.5	--	--	0.739	10
	November 2017 Mobile Dual Phase Extraction Event										
	GW-11145957-090618-CN-MW-1	9/6/2018	(orig)	2.86	2.65	0.747	7.59	--	--	0.802	14.4
	MW-1	8/12/2019	(orig)	2.19	1.61	0.944	7.0	--	--	0.395	184
	MW-1	8/12/2020	(orig)	2.13	1.25	0.815	5.9	--	--	0.297	237
MW-2	MW-2	10/24/2008	(orig)	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.005	--	--	974
	MW-2	1/29/2009	(orig)	< 0.0005	< 0.0005	< 0.0005	< 0.0005	--	--	--	--
	MW-2	9/25/2009	(orig)	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.02	0.04	1,260
	MW-2	9/22/2010	(orig)	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	--	0.0074	1,350
	GW-074925-092811-CM-002	9/28/2011	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.0001	2.49	0.0956	1,290
	GW-074925-092612-CM-MW-2	9/26/2012	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.0005	< 0.05	< 0.005	1,210
	GW-074925-091713-CM-MW-2	9/17/2013	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.0005	< 0.05	< 0.005	1,230
	GW-074925-092314-SP-MW-2	9/23/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.00045	< 0.05	< 0.005	1,190
	GW-074925-092215-CB-MW-2	9/22/2015	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.0005	< 0.050	< 0.005	1,210
	GW-074925-091516-CM-MW-2	9/14/2016	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.00045	< 0.050	< 0.005	1,270
	GW-11145957-092717-SP-MW-2	9/27/2017	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	< 0.005	1,150
	GW-11145957-090618-CN-MW-2	9/6/2018	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	< 0.005	1,430
	MW-2	8/15/2019	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	0.0344	1,250
	MW-2	8/12/2020	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	<0.0100	1,330
MW-3	MW-3	10/24/2008	(orig)	0.02	< 0.0005	< 0.0005	0.024	< 0.005	--	--	714
	MW-3	1/29/2009	(orig)	0.012	< 0.0005	< 0.0005	0.005	--	--	--	--
	MW-3	9/25/2009	(orig)	0.0021	< 0.001	< 0.001	< 0.002	< 0.001	< 0.02	1.24	1,070
	MW-3	9/22/2010	(orig)	0.0042	< 0.001	< 0.001	< 0.001	< 0.001	--	1.11	1,060
	GW-074925-092811-CM-003	9/28/2011	(orig)	0.0038	< 0.001	< 0.001	< 0.003	< 0.0001	1.58	0.704	809
	GW-074925-092612-CM-MW-3	9/26/2012	(orig)	0.0016	< 0.001	< 0.001	< 0.003	< 0.0005	0.063	0.67	892
	GW-074925-091713-CM-MW-3	9/17/2013	(orig)	0.0012	< 0.001	< 0.001	< 0.003	< 0.0005	0.8	0.67	808
	GW-074925-092314-SP-MW-3	9/23/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.00053	0.83	0.65	598
	GW-074925-121714-CM-MW-3	12/17/2014	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.00045	--	--	--
	GW-074925-092215-CB-MW-3	9/22/2015	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.00045	0.079	0.79	943
	GW-074925-091516-CM-MW-3	09/14/2016	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	< 0.00045	0.22	0.48	671
	GW-11145957-092717-SP-MW-3	9/27/2017	(orig)	0.0031	< 0.001	< 0.001	< 0.003	--	--	0.471	680
	GW-11145957-090618-CN-MW-3	9/6/2018	(orig)	0.001	< 0.001	< 0.001	< 0.003	--	--	0.477	976
	MW-3	8/12/2019	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	0.496	73.9
	MW-3	8/12/2020	(orig)	< 0.001	< 0.001	< 0.001	< 0.003	--	--	0.55	138

Well ID	Sample ID	Sample Date	Sample Type	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Naphthalene	Iron (dissolved) (mg/L)	Manganese (dissolved) (mg/L)	Sulfate (mg/L)
NMWQCC Standards				0.010	0.75	0.75	0.62	0.03	1.0	0.20	600
MW-4	MW-4	10/24/2008	(orig)	0.024	< 0.0005	0.006	0.01	< 0.005	--	--	678
	MW-4	1/29/2009	(orig)	0.11	0.006	0.009	0.147	< 0.005	--	--	--
	MW-4	9/25/2009	(orig)	0.0088	< 0.001	0.0057	0.002	< 0.001	0.508	1.24	968
	MW-4	9/22/2010	(orig)	0.019	0.005	0.0069	0.0057	< 0.001	--	1.27	1040
	GW-074925-092811-CM-001	9/28/2011	(orig)	0.0256	0.0078	0.0017	0.0106	< 0.0001	0.532	1.82	960
	GW-074925-092612-CM-MW-4	9/26/2012	(orig)	0.0124	0.0023	< 0.001	< 0.003	< 0.0005	0.57	1.5	949
	GW-074925-092612-CM-DUP	9/26/2012	(Duplicate)	0.013	0.0022	< 0.001	0.0031	--	--	--	--
	August 2013 Mobile Dual Phase Extraction Event										
	GW-074925-091713-CM-MW-4	9/17/2013	(orig)	0.0065	< 0.001	< 0.001	< 0.003	< 0.0005	0.51	1.6	925
	GW-074925-092314-SP-MW-4	9/23/2014	(orig)	0.0068	< 0.001	0.0011	< 0.003	< 0.00053	0.39	2.2	905
	November 2014 Mobile Dual Phase Extraction Event										
	GW-074925-121714-CM-MW-4	12/17/2014	(orig)	0.003	< 0.001	< 0.001	< 0.003	< 0.00045	--	--	--
	GW-074925-092314-CM-DUP	12/17/2014	(Duplicate)	0.0039	< 0.001	< 0.001	< 0.003	--	--	--	--
	April 2015 Mobile Dual Phase Extraction Event										
	GW074925-061815-CB-MW-4	6/18/2015	(orig)	0.0039	< 0.001	< 0.001	< 0.003	< 0.00045	--	--	--
	GW-074925-092215-CB-MW-4	9/22/2015	(orig)	0.0018	< 0.001	< 0.001	< 0.003	< 0.0005	0.21	1.9	911
	GW-074925-091516-CM-MW-4	9/14/2016	(orig)	0.0047	< 0.001	< 0.001	< 0.003	< 0.00045	0.24	2	943
	GW-11145957-092717-SP-MW-4	9/27/2017	(orig)	0.0266	< 0.001	< 0.001	0.004	--	--	2.46	948
	November 2017 Mobile Dual Phase Extraction Event										
	GW-11145957-090618-CN-MW-4	9-6-2018	(orig)	0.132	<0.001	<0.001	0.0165	--	--	1.74	1,000
	MW-4	8/16/2019	(orig)	0.0087	< 0.001	< 0.001	< 0.003	--	--	1.57	858
	MW-4	8/13/2020	(orig)	0.0184	<0.001	<0.001	< 0.003	--	--	1.65	960

Notes:

mg/L - milligrams per liter

J - laboratory flag for estimated concentration

ND - not detected, practical quantitation limit unknown

NE - not established

NMWQCC - New Mexico Water Quality Control Commission

<0.037 - indicates result less than the stated laboratory reporting limit (PQL)

BOLD - indicates concentration exceeds the NNEPA standard

-- - not analyzed

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

August 21, 2020

HilCorp-Farmington, NM

Sample Delivery Group:	L1250956
Samples Received:	08/14/2020
Project Number:	
Description:	Johnston Federal #4
Site:	JOHNSTON FEDERAL #4
Report To:	Kurt Hoekstra 382 Road 3100 Aztec, NM 87410

Entire Report Reviewed By:

Olivia Studebaker
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 Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

TABLE OF CONTENTS

MW-1 L1250956-01 GW

Collected by: Kurt | Collected date/time: 08/12/20 13:15 | Received date/time: 08/14/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1527566	10	08/18/20 19:19	08/18/20 19:19	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1528289	1	08/19/20 22:11	08/20/20 13:06	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1528595	50	08/19/20 13:34	08/19/20 13:34	ACG	Mt. Juliet, TN

MW-2 L1250956-02 GW

Collected by: Kurt | Collected date/time: 08/12/20 11:35 | Received date/time: 08/14/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1527566	20	08/18/20 19:34	08/18/20 19:34	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1528289	1	08/19/20 22:11	08/20/20 13:09	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1527642	1	08/18/20 08:18	08/18/20 08:18	JHH	Mt. Juliet, TN

MW-3 L1250956-03 GW

Collected by: Kurt | Collected date/time: 08/12/20 14:40 | Received date/time: 08/14/20 09:30

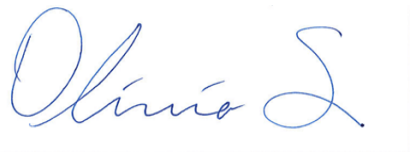
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1527566	5	08/18/20 19:49	08/18/20 19:49	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1528289	1	08/19/20 22:11	08/20/20 13:12	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1527642	1	08/18/20 08:38	08/18/20 08:38	JHH	Mt. Juliet, TN

MW-4 L1250956-04 GW

Collected by: Kurt | Collected date/time: 08/13/20 11:25 | Received date/time: 08/14/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Wet Chemistry by Method 9056A	WG1527566	10	08/18/20 20:04	08/18/20 20:04	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1528289	1	08/19/20 22:11	08/20/20 13:15	TRB	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1527642	1	08/18/20 08:57	08/18/20 08:57	JHH	Mt. Juliet, TN

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.



Olivia Studebaker
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Sulfate	237		50.0	10	08/18/2020 19:19	WG1527566

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Manganese,Dissolved	0.297		0.0100	1	08/20/2020 13:06	WG1528289

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	2.13		0.0500	50	08/19/2020 13:34	WG1528595
Toluene	1.25		0.0500	50	08/19/2020 13:34	WG1528595
Ethylbenzene	0.815		0.0500	50	08/19/2020 13:34	WG1528595
Total Xylenes	5.89		0.150	50	08/19/2020 13:34	WG1528595
(S) Toluene-d8	*97.6*		*80.0-120*		*08/19/2020 13:34*	WG1528595
(S) 4-Bromofluorobenzene	*102*		*77.0-126*		*08/19/2020 13:34*	WG1528595
(S) 1,2-Dichloroethane-d4	*109*		*70.0-130*		*08/19/2020 13:34*	WG1528595

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Sulfate	1330		100	20	08/18/2020 19:34	WG1527566

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Manganese,Dissolved	ND		0.0100	1	08/20/2020 13:09	WG1528289

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	ND		0.00100	1	08/18/2020 08:18	WG1527642
Toluene	ND		0.00100	1	08/18/2020 08:18	WG1527642
Ethylbenzene	ND		0.00100	1	08/18/2020 08:18	WG1527642
Total Xylenes	ND		0.00300	1	08/18/2020 08:18	WG1527642
(S) Toluene-d8	*102*		*80.0-120*		*08/18/2020 08:18*	WG1527642
(S) 4-Bromofluorobenzene	*105*		*77.0-126*		*08/18/2020 08:18*	WG1527642
(S) 1,2-Dichloroethane-d4	*102*		*70.0-130*		*08/18/2020 08:18*	WG1527642

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	138		25.0	5	08/18/2020 19:49	WG1527566

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Manganese,Dissolved	0.550		0.0100	1	08/20/2020 13:12	WG1528289

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

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Benzene	ND		0.00100	1	08/18/2020 08:38	WG1527642
Toluene	ND		0.00100	1	08/18/2020 08:38	WG1527642
Ethylbenzene	ND		0.00100	1	08/18/2020 08:38	WG1527642
Total Xylenes	ND		0.00300	1	08/18/2020 08:38	WG1527642
(S) Toluene-d8	*102*		*80.0-120*		*08/18/2020 08:38*	WG1527642
(S) 4-Bromofluorobenzene	*106*		*77.0-126*		*08/18/2020 08:38*	WG1527642
(S) 1,2-Dichloroethane-d4	*100*		*70.0-130*		*08/18/2020 08:38*	WG1527642

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Sulfate	960		50.0	10	08/18/2020 20:04	WG1527566

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Manganese,Dissolved	1.65		0.0100	1	08/20/2020 13:15	WG1528289

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

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Benzene	0.0184		0.00100	1	08/18/2020 08:57	WG1527642
Toluene	ND		0.00100	1	08/18/2020 08:57	WG1527642
Ethylbenzene	ND		0.00100	1	08/18/2020 08:57	WG1527642
Total Xylenes	ND		0.00300	1	08/18/2020 08:57	WG1527642
(S) Toluene-d8	*97.2*		*80.0-120*		*08/18/2020 08:57*	WG1527642
(S) 4-Bromofluorobenzene	*102*		*77.0-126*		*08/18/2020 08:57*	WG1527642
(S) 1,2-Dichloroethane-d4	*99.9*		*70.0-130*		*08/18/2020 08:57*	WG1527642

Method Blank (MB)

(MB) R3561348-1 08/18/20 08:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sulfate	U		0.594	5.00

L1249169-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1249169-01 08/18/20 13:06 • (DUP) R3561348-3 08/18/20 13:21

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	5.77	5.78	1	0.232		15

L1250094-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1250094-01 08/18/20 17:05 • (DUP) R3561348-6 08/18/20 17:20

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	17.6	17.6	1	0.210		15

Laboratory Control Sample (LCS)

(LCS) R3561348-2 08/18/20 08:37

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40.0	40.0	99.9	80.0-120	

L1249175-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1249175-01 08/18/20 13:36 • (MS) R3561348-4 08/18/20 13:51 • (MSD) R3561348-5 08/18/20 14:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50.0	5.83	54.2	55.0	96.8	98.3	1	80.0-120			1.39	15

L1250232-10 Original Sample (OS) • Matrix Spike (MS)

(OS) L1250232-10 08/18/20 18:35 • (MS) R3561348-7 08/18/20 18:50

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50.0	410	442	64.4	1	80.0-120	E V

Method Blank (MB)

(MB) R3561987-1 08/20/20 12:50

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Manganese,Dissolved	U		0.00327	0.0100

Laboratory Control Sample (LCS)

(LCS) R3561987-2 08/20/20 12:53

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Manganese,Dissolved	1.00	0.940	94.0	80.0-120	

Method Blank (MB)

(MB) R3561401-3 08/18/20 06:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
Ethylbenzene	U		0.000137	0.00100
Toluene	U		0.000278	0.00100
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	*102*			*80.0-120*
(S) 4-Bromofluorobenzene	*107*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*99.2*			*70.0-130*

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

(LCS) R3561401-1 08/18/20 05:08 • (LCSD) R3561401-2 08/18/20 05:28

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	0.00500	0.00478	0.00474	95.6	94.8	70.0-123			0.840	20
Ethylbenzene	0.00500	0.00489	0.00470	97.8	94.0	79.0-123			3.96	20
Toluene	0.00500	0.00496	0.00490	99.2	98.0	79.0-120			1.22	20
Xylenes, Total	0.0150	0.0144	0.0141	96.0	94.0	79.0-123			2.11	20
(S) Toluene-d8				*101*	*99.7*	*80.0-120*				
(S) 4-Bromofluorobenzene				*106*	*106*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*95.9*	*96.3*	*70.0-130*				

Method Blank (MB)

(MB) R3561500-3 08/19/20 10:56

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Benzene	U		0.0000941	0.00100
Ethylbenzene	U		0.000137	0.00100
Toluene	U		0.000278	0.00100
Xylenes, Total	U		0.000174	0.00300
(S) Toluene-d8	*103*			*80.0-120*
(S) 4-Bromofluorobenzene	*94.7*			*77.0-126*
(S) 1,2-Dichloroethane-d4	*119*			*70.0-130*

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

(LCS) R3561500-1 08/19/20 09:57 • (LCSD) R3561500-4 08/19/20 11:16

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	0.00500	0.00484	0.00459	96.8	91.8	70.0-123			5.30	20
Ethylbenzene	0.00500	0.00471	0.00480	94.2	96.0	79.0-123			1.89	20
Toluene	0.00500	0.00494	0.00498	98.8	99.6	79.0-120			0.806	20
Xylenes, Total	0.0150	0.0139	0.0142	92.7	94.7	79.0-123			2.14	20
(S) Toluene-d8				*93.3*	*94.2*	*80.0-120*				
(S) 4-Bromofluorobenzene				*88.6*	*88.6*	*77.0-126*				
(S) 1,2-Dichloroethane-d4				*115*	*120*	*70.0-130*				

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.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

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.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
V	The sample concentration is too high to evaluate accurate spike recoveries.

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	T104704245-18-15
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

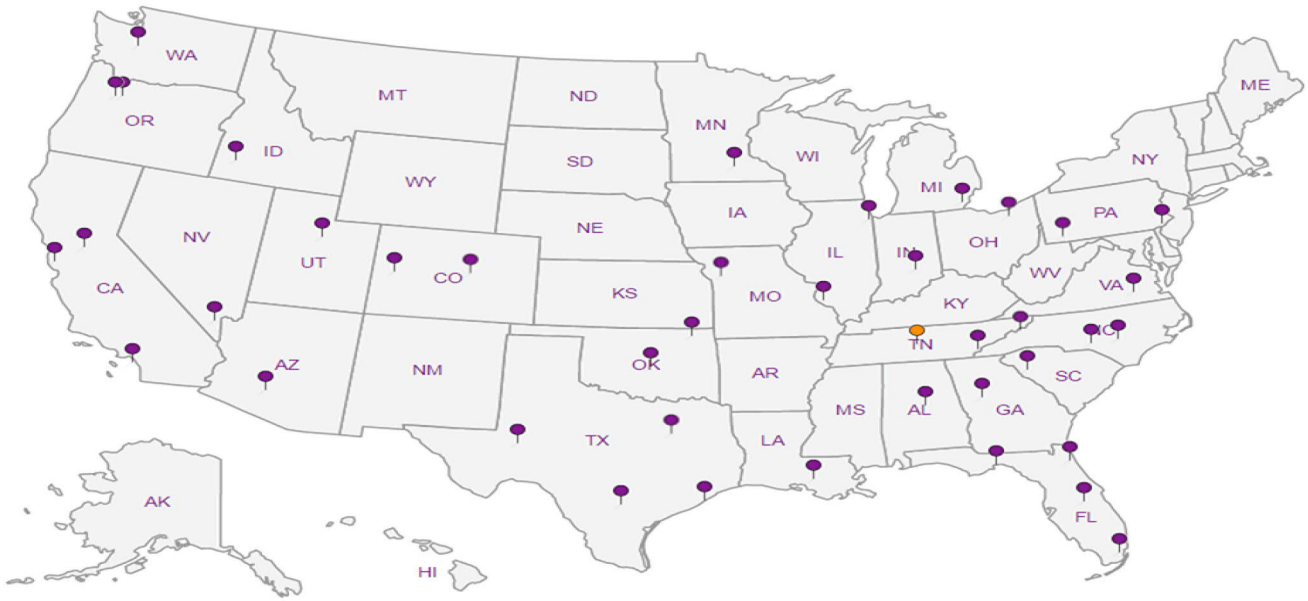
Third Party Federal Accreditations

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 87410

Billing Information:
Clara Cardoza
PO Box 61529
Houston, TX 77208

Report to: **Kurt Hoekstra**

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

Project Description: **Johnston Federal #4**

City/State Collected:

Please Circle: PT MT CT ET

Phone: **505-486-9543**

Client Project #

Lab Project # **HILCORANM-JOHNSTON#4**

Collected by (print): Kurt

Collected by (signature): Kurt Hoekstra

Immediately Packed on Ice N ___ Y X

Site/Facility ID # **JOHNSTON FEDERAL #4**

P.O. #

Quote #

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

Date Results Needed

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	MNDICP 250mlHDPE-NoPres	SULFATE 125mlHDPE-NoPres	V8260BTEX 40mlAmb-HCl	Remarks	Sample # (lab only)
MW-1		GW		8-12	1:15	5	X	X	X		-01
MW-2		GW		8-12	11:35	5	X	X	X		-02
MW-3		GW		8-12	2:40	5	X	X	X		-03
MW-4		GW		8-13	11:25	5	X	X	X		-04

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

SDG # 1250956
B216

Acctnum: **HILCORANM**
Template: **T170489**
Prelogin: **P784437**
PM: **823 - Olivia Studebaker**
PB:
Shipped Via:

* 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:
X UPS __ FedEx __ Courier _____

Tracking # 184543252601

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: __Y __N

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Kurt Hoekstra	8-13-20	1:05	
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: DA2 °C 1.3 1.2

Bottles Received: 20

Date: 08/14/20 Time: 0400

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 20513

CONDITIONS

Operator:	OGRID:
HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	372171
	Action Number: 20513
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Review of 2020 Annual Groundwater Report: Content satisfactory 1. Continue annual monitoring and sampling for groundwater quality in 2021 2. Submit the Annual Monitoring Report to the OCD no later than March 31, 2022	12/28/2021