


REVIEWED
By Mike Buchanan at 2:29 pm, May 17, 2024

March 8, 2022

New Mexico Energy, Minerals and Natural Resources Department
 New Mexico Oil Conservation Division
 1000 Rio Brazos
 Aztec, New Mexico 87410

**Subject: 2021 Annual Groundwater Monitoring Report
 Nell Hall #1
 San Juan County, New Mexico
 NMOCD Incident Number: NAUTOFAB000417
 NMOCD Administrative Order: 3RP-090**

To Whom it May Concern:

WSP USA Inc. (WSP), on behalf of Hilcorp Energy Company (Hilcorp), is submitting the 2021 Annual Groundwater Monitoring Report to the New Mexico Oil Conservation Division (NMOCD) to document groundwater monitoring conducted at the Nell Hall #1 natural gas production site (Site) during 2021. The Site is located in private land, approximately 2 miles west of Aztec, New Mexico in Section 7, Township 30N, Range 11W, San Juan County, New Mexico (Figure 1).

SITE BACKGROUND

Petroleum-impacted soil was first discovered at the Site during the closure of the Site in 1994 by Conoco, Inc. (operator of the Site at the time and later ConocoPhillips Company). At the time of discovery, groundwater monitoring wells, MW-1, MW-2, and MW-3, were installed at the Site to assess groundwater conditions and monitor the release of petroleum hydrocarbons. Conoco, Inc. also installed eight air-sparge wells (SP-1 through SP-8, shown on Figure 2) in order to introduce air into the water-bearing zone and enhance volatilization and biodegradation of the petroleum hydrocarbons in the groundwater; however, no information or data in the historical Site reports indicate whether the air-sparge wells were ever operated as intended.

Drought conditions in the 1990's and early 2000's resulted in a water table decline to an elevation below the screened intervals of the monitoring wells. In response, monitoring wells MW-4, MW-5, and MW-6 were subsequently installed in 2004 and constructed using 30 to 35 feet of slotted screen in order to intersect the water-table over large fluctuations (caused by seasonal changes and/or nearby irrigation). Two additional wells (MW-7 and MW-8) were subsequently installed in 2015 to further assess subsurface soils and groundwater quality conditions downgradient of MW-6.

Hilcorp acquired the Site from ConocoPhillips Company in April 2017 and has continued quarterly gauging and sampling of wells at the Site.

SITE GROUNDWATER CLEANUP STANDARDS

NMOCD requires groundwater-quality standards presented by the New Mexico Water Quality Control Commission (NMWQCC) in 20.6.2.3103 of the New Mexico Administrative Code (NMAC) be met. The following standards are presented for the constituents of concern at the Site in milligrams per liter (mg/L).

ANALYTE	LIMIT
Benzene	0.005 mg/L
Toluene	1.0 mg/L
Ethylbenzene	0.70 mg/L
Total Xylenes	0.62 mg/L
Dissolved Iron	1.0 mg/L

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GROUNDWATER SAMPLING ACTIVITIES AND RESULTS

Groundwater-level measurements and samples were collected in March, June, September, and November 2021 from wells MW-4 through MW-8. Wells MW-4, MW-6, and MW-8 were not sampled in March 2021 due to low groundwater levels. Additionally, groundwater-level measurements were collected in March and November 2021 in wells MW-1, MW-2, and MW-3. The following sections summarize the sampling procedures and results gathered during these events.

GROUNDWATER-LEVEL MEASUREMENTS

Static groundwater-level monitoring included recording depth-to-groundwater using a Keck oil/water interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with distilled water prior to each measurement to prevent cross-contamination. Groundwater elevations measured in monitoring wells during the 2021 sampling events are presented in Table 1 and were used to develop groundwater potentiometric surface maps (Figures 3, 4, 5, and 6). The inferred groundwater flow direction is generally to the southeast.

GROUNDWATER SAMPLING

Groundwater was purged and sampled using a disposable bailer prior to sampling. Purging was accomplished by removing stagnant groundwater from the monitoring well prior to collecting a sample. Field measurements of groundwater quality parameters, including temperature, pH, electrical conductivity, total dissolved solids, dissolved oxygen, and oxidation-reduction potential, were collected during the purging process and are presented in Table 2.

Following well purging, groundwater samples were placed directly into laboratory-provided vials and labeled with the date and time of collection, well designation, project name, sample collector's name, and parameters to be analyzed. They were immediately sealed and packed on ice to preserve samples. Samples from March 2021 were submitted to Pace Analytical for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8260B, and dissolved iron by EPA Method 6010B. Samples collected in June, September, and November 2021 were submitted to Hall Environmental Analysis Laboratory in Albuquerque, NM, for analysis of BTEX by EPA method 8260B, and dissolved iron by EPA method 200.7. Proper chain-of-custody (COC) procedures were followed documenting the date and time sampled, sample number, type of sample, sample collector's name, preservative used, analyses required, and sample collector's signature. Analytical laboratory reports from the sampling events are included as Enclosure A.

GROUNDWATER ANALYTICAL RESULTS

During the June and November 2021 groundwater-sampling events, benzene was detected in well MW-6 at concentrations of 0.073 mg/L and 0.14 mg/L respectively, exceeding the NMWQCC standard. Benzene was not detected above the NMWQCC standards in any of the other sampled wells. Toluene, ethylbenzene, and total xylenes were also not detected above the NMWQCC standards in any of the sampled wells. Additionally, dissolved iron was detected at concentrations exceeding NMWQCC standards in MW-4 during the March 2021 sampling event, as well as MW-6 during the June and September 2021 sampling events.

A summary of analytical results are presented in Table 3 and on Figure 7.

CONCLUSIONS

Overall, BTEX concentrations in groundwater have decreased over time at the Site. BTEX concentrations have not been detected above laboratory reporting limits in wells MW-4, MW-5, MW-7, and MW-8 in more than four years. Well MW-6 has concentrations of benzene exceeding NMWQCC standards; however, concentrations have steadily declined in this well since 2013. Additionally, concentrations of dissolved iron exceeding the NMWQCC standard were detected in MW-4 during the June 2021 sampling event and MW-6 during the June and September 2021 sampling events. Although detected above standards in MW-4, dissolved iron had not previously been detected above laboratory reporting limits in this well since 2018.

Dissolved iron concentrations have consistently exceeded the NMWQCC standard in well MW-6 since it was first analyzed in 2009. Similar to benzene concentrations in this well, dissolved iron concentrations have also steadily declined since 2013. Elevated iron concentrations in well MW-6 appear to be a result of generally low-oxygen and reducing groundwater conditions in this area, which is a common byproduct of petroleum degradation in groundwater systems. This is further evidenced by the low concentrations of iron in wells outside of the release area and the impacted groundwater plume. As groundwater conditions at the Site continue to equilibrate



and dissolved oxygen increases, groundwater conditions will become increasingly aerobic. As this happens, dissolved iron has the ability to precipitate out of solution leading to decreased concentrations in groundwater.

Lastly, wells MW-7 and MW-8 are located downgradient of MW-6 and continue to exhibit BTEX and dissolved iron concentrations below NMWQCC standards, which indicates that the groundwater plume is localized to the vicinity of MW-6 and has not migrated downgradient with groundwater flow. Furthermore, overall Site conditions indicate that the petroleum-hydrocarbon plume is stable and decreasing in magnitude.

RECOMMENDATIONS

The December 28, 2021 NMOCD approval of the *2020 Annual Groundwater Report* (dated March 11, 2021) provides conditions that Hilcorp continue to remove non-aqueous phase liquid (NAPL) and dissolved phase constituents from Site wells. Based on historical data, NAPL has never been identified at the Site, therefore no recovery has taken place to date. In addition, historical data indicates dissolved phase constituents have been greatly reduced at the Site and are currently only present in well MW-6 at concentrations exceeding NMWQCC standards. Based on these data, it is believed that monitored natural attenuation is an appropriate remedial action to manage the residual benzene and iron concentrations present in well MW-6.

Based on current and historical data gathered at the Site, WSP/Hilcorp recommend the following actions:

- Plug and abandon air-spargers wells SP-1 through SP-8. These wells have never been used for active air-sparging and should be removed to eliminate a potential conduit to groundwater at the Site.
- Plug and abandon wells MW-1 through MW-5. With the exception of dissolved iron concentrations in MW-4 during the June 2021 sampling events, BTEX and dissolved iron concentrations have been compliant with NMWQCC standards for more than three years in these wells.
- Sample wells MW-6, MW-7, and MW-8 on a semi-annual basis for BTEX and dissolved iron constituents. Wells MW-7 and MW-8 are located downgradient of well MW-6 and will serve as points of compliance to ensure that benzene and dissolved iron concentrations are not migrating off-Site. Once concentrations are compliant with NMWQCC standards, sampling frequency will be increased to quarterly until eight consecutive quarters are below applicable standards.

WSP appreciates the opportunity to provide these environmental services to Hilcorp. Please contact either of the undersigned with any questions at (970) 385-1096.

Kind regards,

A handwritten signature in black ink, appearing to read 'Stuart'.

Stuart Hyde, L.G.
Senior Geologist

A handwritten signature in black ink, appearing to read 'Daniel Moir'.

Daniel Moir, P.G.
Sr. Lead Consultant, Geologist

Enclosed:

- Figure 1: Site Location Map
- Figure 2: Site Map
- Figure 3: Q1 Groundwater Elevation Map
- Figure 4: Q2 Groundwater Elevation Map
- Figure 5: Q3 Groundwater Elevation Map
- Figure 6: Q4 Groundwater Elevation Map
- Figure 7: Annual Groundwater Analytical Results

Table 1: Well Construction Information and Groundwater Elevations

Table 2: Field Parameter Results

Table 3: Petroleum Hydrocarbon Groundwater Analytical Results

Enclosure A: Analytical Laboratory Reports

FIGURES

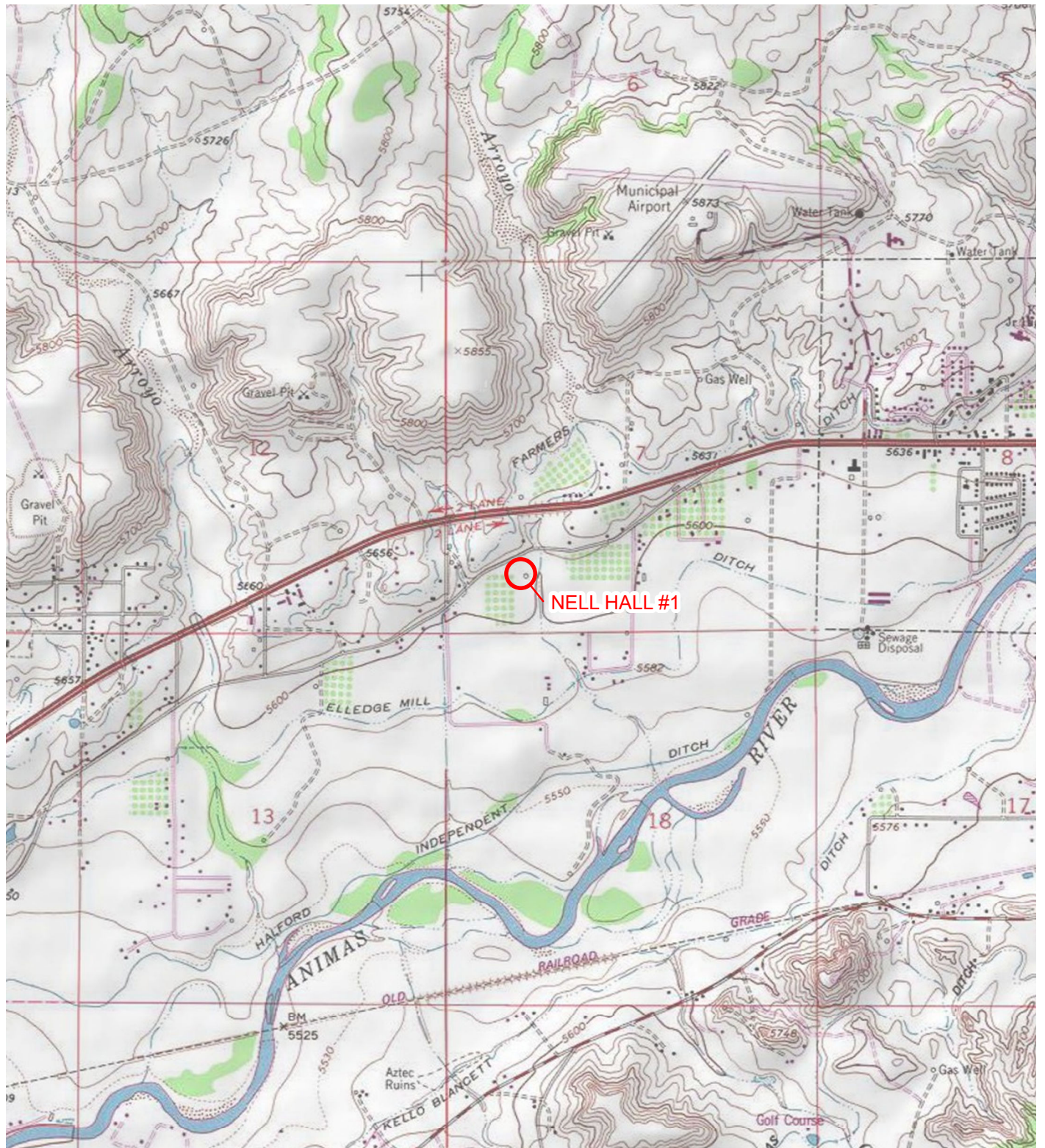


IMAGE COURTESY OF ESRI/USGS

LEGEND

 SITE LOCATION

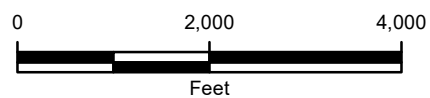


FIGURE 1
SITE LOCATION MAP
NELL HALL #1
 LOT 4 SEC 7-T30N-R11W
 SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY



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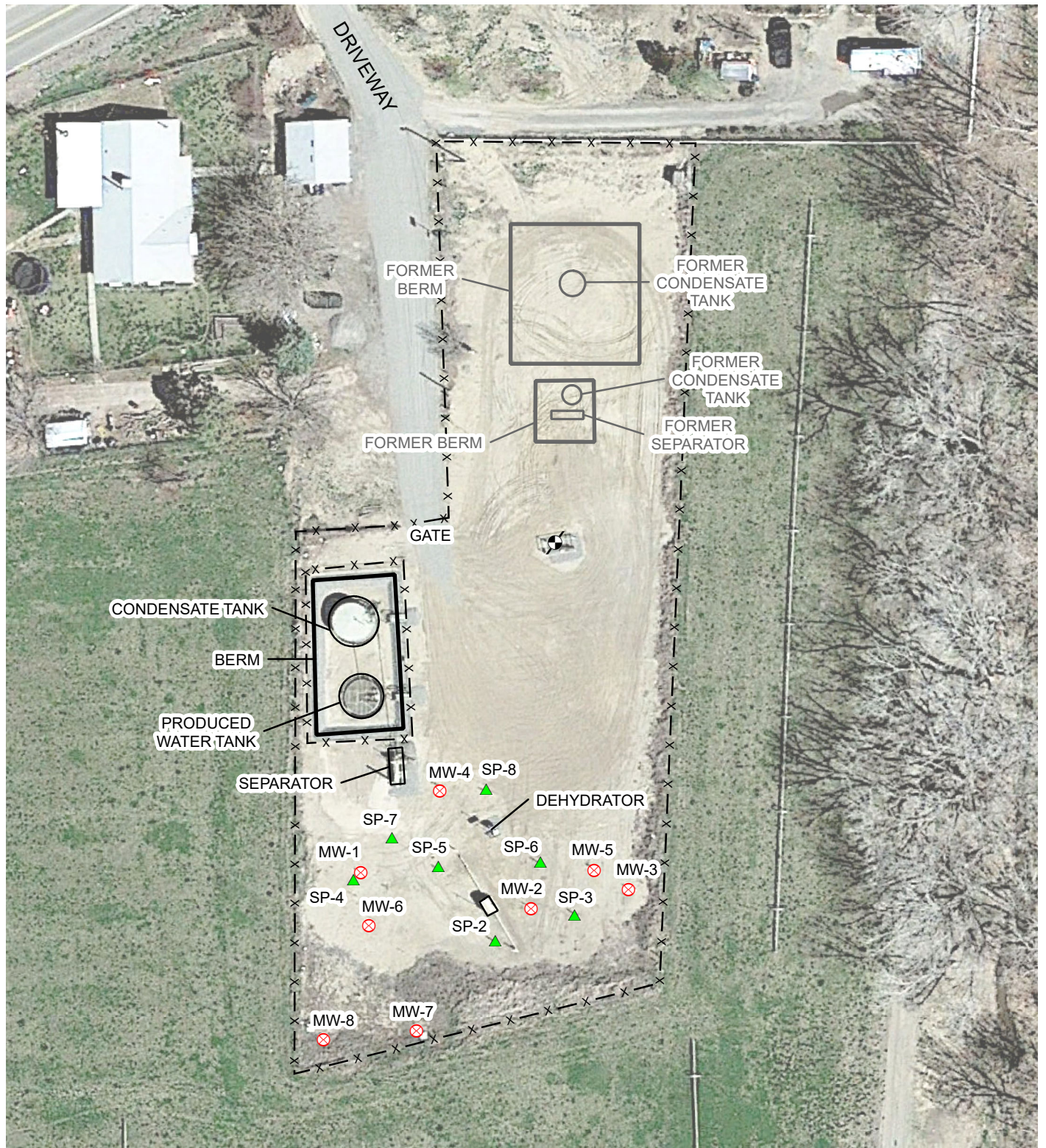


IMAGE COURTESY OF GOOGLE EARTH (4/6/2019)

LEGEND

- ⊗ MONITORING WELL
- ▲ AIR SPARGING LOCATION
- ⚡ NATURAL GAS WELLHEAD
- x — x FENCE

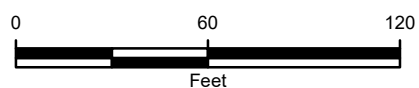
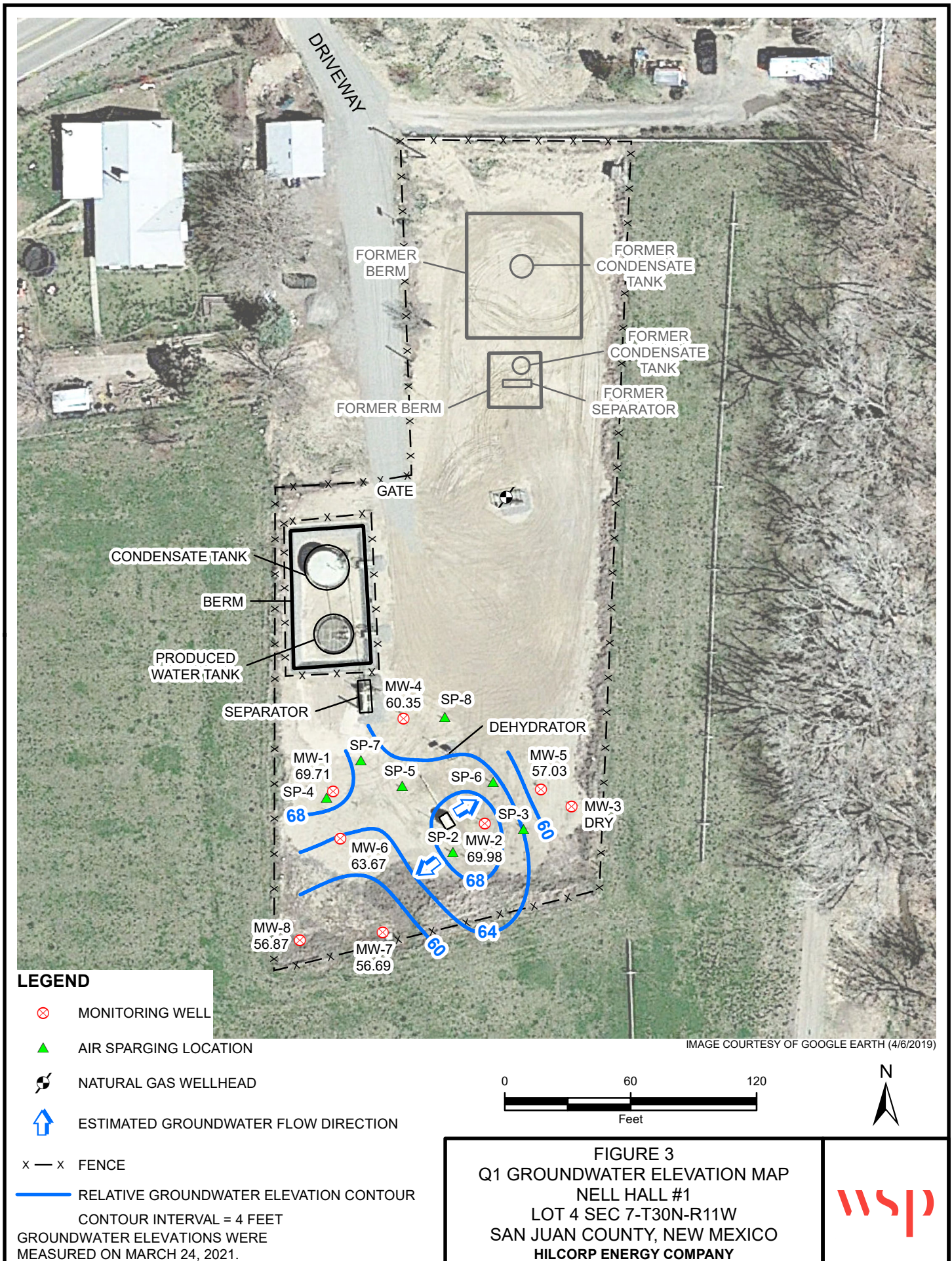
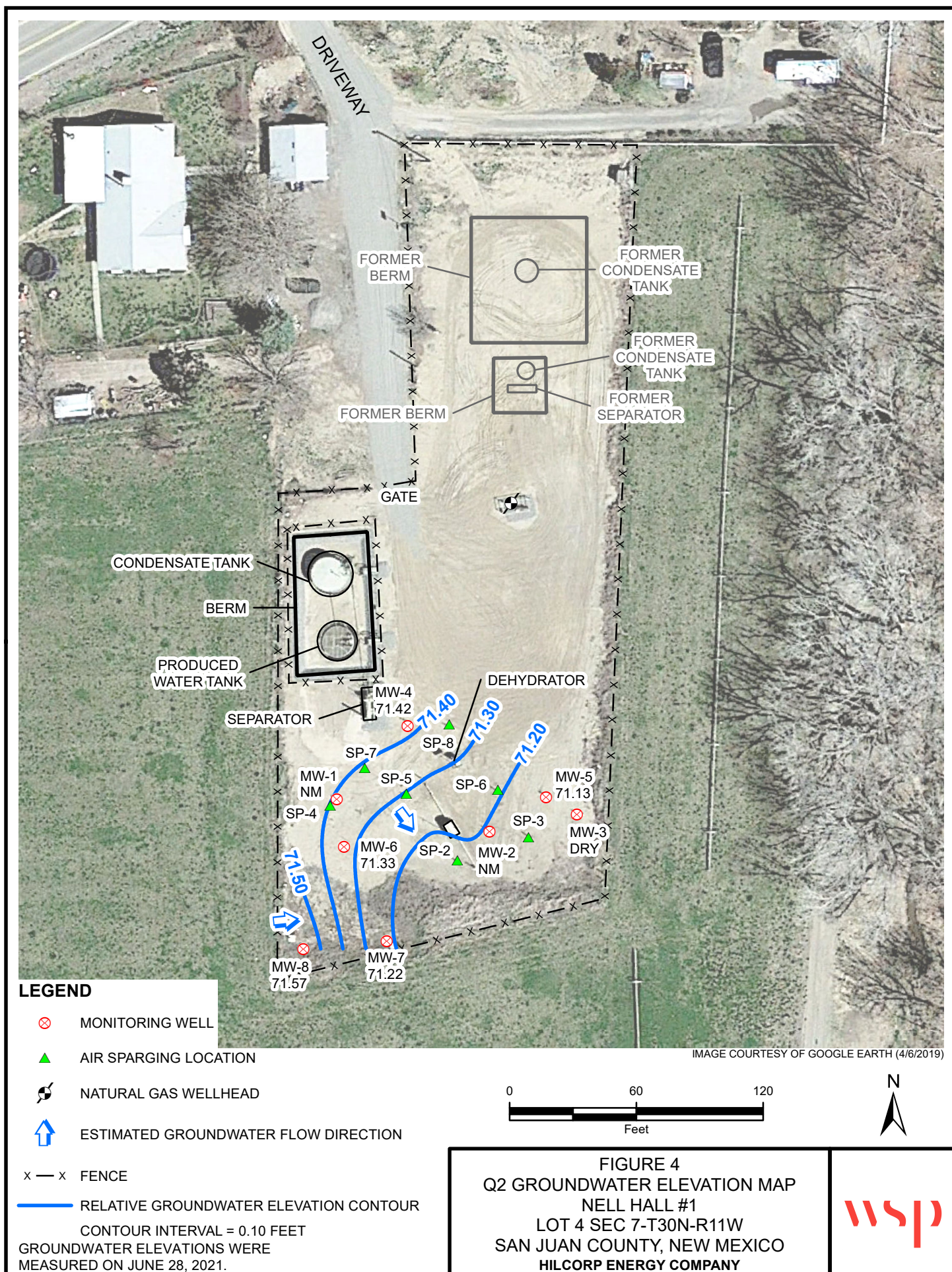


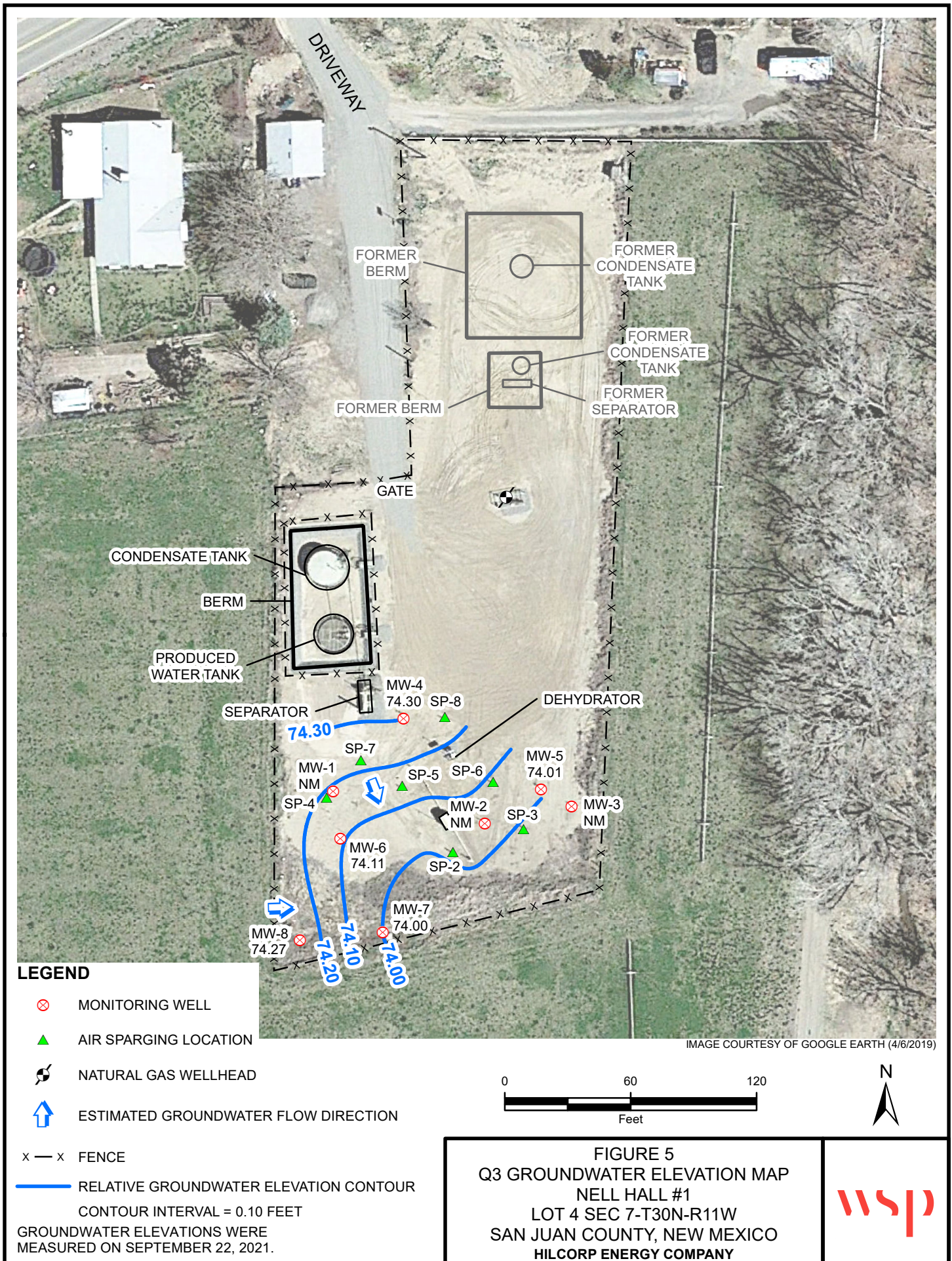
FIGURE 2
SITE MAP
NELL HALL #1
LOT 4 SEC 7-T30N-R11W
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

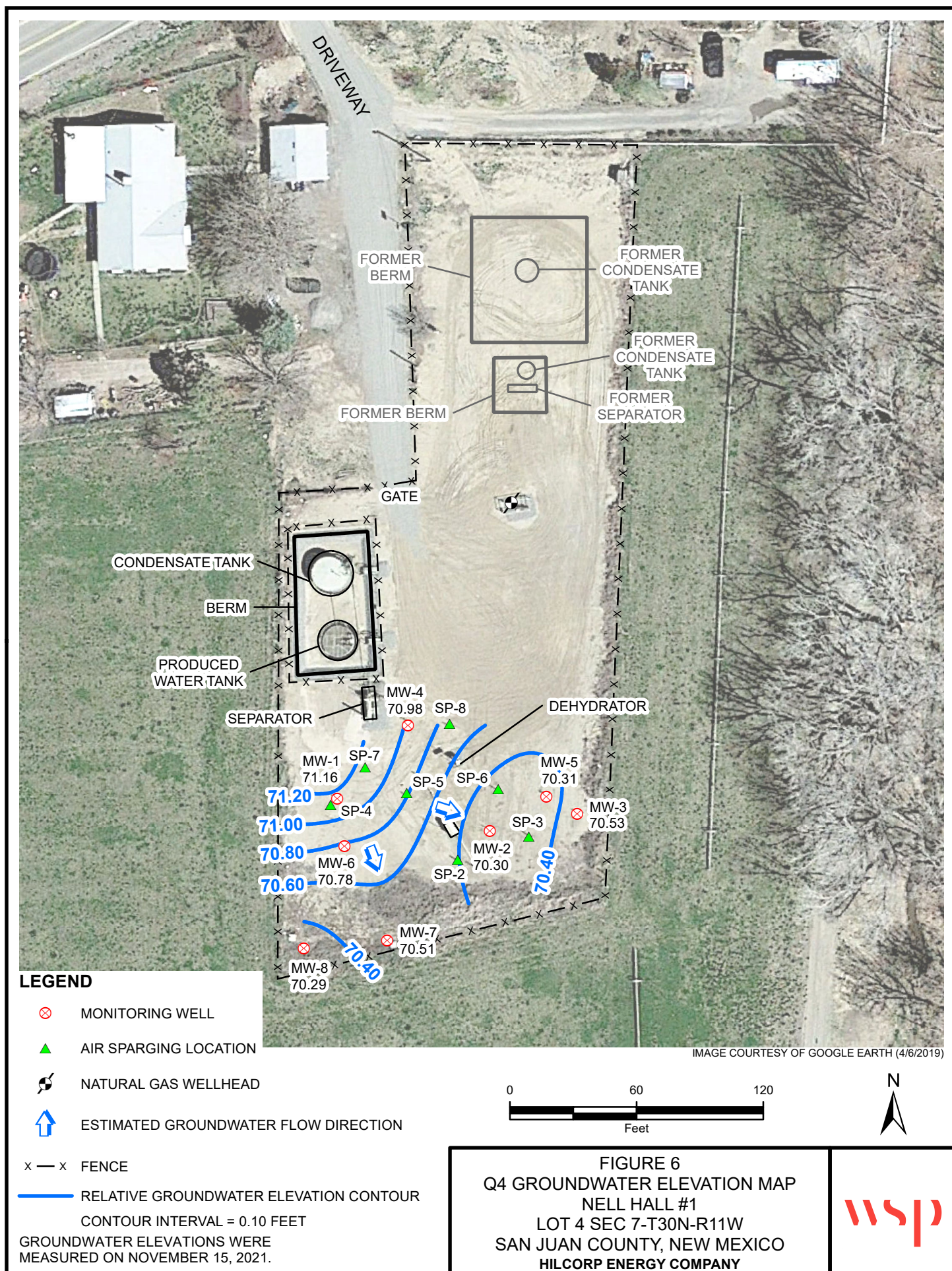


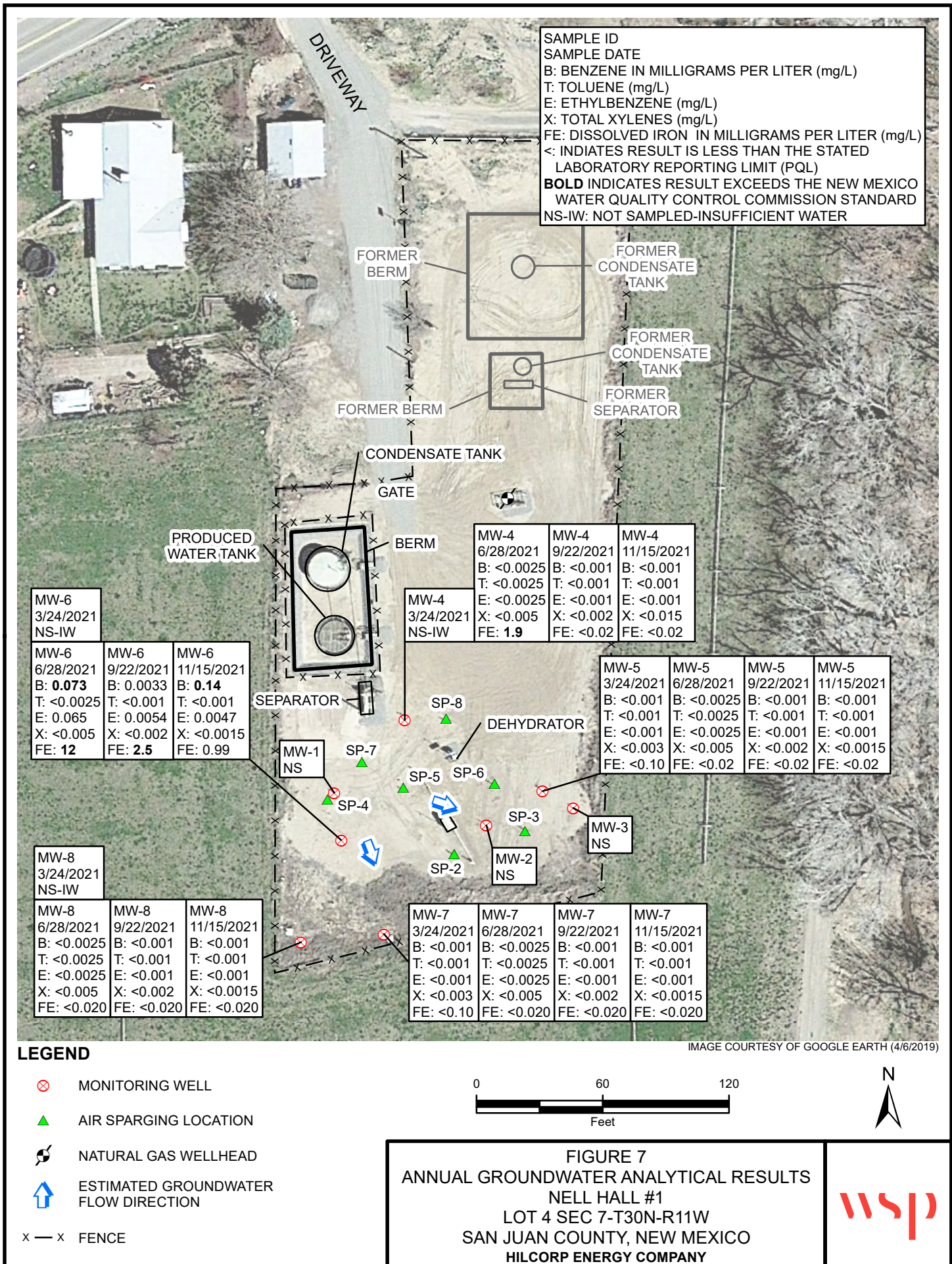
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TABLES

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-1	28.55	Unknown	97.95	5/10/2005	DRY	--
				10/20/2005	19.25	78.70
				11/22/2005	24.15	73.80
				5/17/2006	NM	--
				11/15/2006	21.40	76.55
				2/19/2007	DRY	--
				5/14/2007	24.85	73.10
				8/22/2007	24.61	73.34
				11/6/2007	20.87	77.08
				3/17/2008	DRY	--
				10/22/2008	19.38	78.57
				3/30/2009	28.25	69.70
				9/30/2009	16.56	81.39
				3/31/2010	DRY	--
				6/9/2010	24.16	73.79
				9/27/2010	20.00	77.95
				3/16/2011	DRY	--
				6/21/2011	26.80	71.15
				9/27/2011	17.85	80.10
				12/13/2011	25.39	72.56
				3/7/2012	DRY	--
				6/4/2012	26.40	71.55
				9/20/2012	17.57	80.38
				12/28/2012	DRY	--
				3/28/2013	DRY	--
				6/12/2013	24.33	73.62
				9/11/2013	17.59	80.36
				12/13/2013	27.45	70.50
				3/20/2014	DRY	--
				6/18/2014	25.18	72.77
				9/15/2014	18.68	79.27
				12/15/2014	DRY	--
				3/16/2015	DRY	--
				6/15/2015	27.85	70.10
				9/16/2015	21.71	76.24
				11/30/2015	26.14	71.81
				3/30/2016	DRY	--
				9/8/2016	18.46	79.49
				11/29/2016	25.21	72.74
				6/14/2017	25.05	72.90
				9/25/2017	19.44	78.51
				12/5/2017	27.29	70.66
				3/15/2018	28.36	69.59
				6/27/2018	24.84	73.11

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MW-1	28.55	Unknown	97.95	3/14/2019	28.24	69.71
				5/24/2019	28.24	69.71
				8/27/2019	DRY	--
				12/17/2019	27.80	70.15
				2/19/2020	28.25	69.70
				4/28/2020	28.26	69.69
				8/25/2020	25.17	72.78
				10/28/2020	22.34	75.61
				3/24/2021	28.24	69.71
				6/28/2021	NM	NM
				9/22/2021	NM	NM
				11/15/2021	26.79	71.16
MW-2	27.32	Unknown	97.16	5/10/2005	DRY	--
				10/20/2005	18.81	78.35
				11/22/2005	23.74	73.42
				5/17/2006	22.06	75.10
				11/15/2006	21.01	76.15
				2/19/2007	DRY	--
				5/14/2007	DRY	--
				8/22/2007	18.03	79.13
				11/6/2007	20.43	76.73
				3/17/2008	DRY	--
				10/22/2008	18.83	78.33
				3/30/2009	27.15	70.01
				9/30/2009	16.01	81.15
				3/31/2010	DRY	--
				6/9/2010	23.36	73.80
				9/27/2010	19.42	77.74
				3/16/2011	DRY	--
				6/21/2011	26.43	70.73
				9/27/2011	17.28	79.88
				12/13/2011	25.10	72.06
				3/7/2012	DRY	--
				6/4/2012	25.17	71.99
				9/20/2012	17.30	79.86
				12/28/2012	DRY	--
				3/28/2013	DRY	--
				6/12/2013	23.78	73.38
				9/11/2013	17.22	79.94
				12/13/2013	27.00	70.16
				3/20/2014	DRY	--
				6/18/2014	24.78	72.38
				9/15/2014	18.18	78.98
				12/15/2014	DRY	--
				3/16/2015	DRY	--

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Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-2	27.32	Unknown	97.16	6/15/2015	26.65	70.51
				9/16/2015	21.37	75.79
				11/30/2015	26.04	71.12
				3/30/2016	27.31	69.85
				6/22/2016	25.45	71.71
				9/8/2016	18.09	79.07
				11/29/2016	24.94	72.22
				6/14/2017	24.85	72.31
				9/25/2017	18.96	78.20
				12/5/2017	27.04	70.12
				3/15/2018	DRY	--
				6/27/2018	24.61	72.55
				3/14/2019	27.16	70.00
				5/24/2019	27.21	69.95
				8/27/2019	24.74	72.42
				12/17/2019	27.05	70.11
				2/19/2020	27.14	70.02
				4/28/2020	27.20	69.96
				8/24/2020	24.61	72.55
				10/28/2020	21.89	75.27
				3/24/2021	27.18	69.98
MW-3	27.45	Unknown	97.77	6/28/2021	NM	NM
				9/22/2021	NM	NM
				11/15/2021	26.86	70.30
				5/10/2005	DRY	--
				10/20/2005	19.36	78.41
				11/22/2005	24.24	73.53
				5/17/2006	22.82	74.95
				11/15/2006	21.53	76.24
				2/19/2007	DRY	--
				5/14/2007	DRY	--
				8/22/2007	18.36	79.41
				11/6/2007	20.95	76.82
				3/17/2008	DRY	--
				10/22/2008	19.34	78.43
				3/30/2009	DRY	--
				9/30/2009	NM	--
				3/31/2010	DRY	--
				6/9/2010	23.87	73.90
				9/27/2010	19.93	77.84
				3/16/2011	DRY	--
				6/21/2011	27.06	70.71
				9/27/2011	17.82	79.95
				12/13/2011	25.66	72.11
				3/7/2012	DRY	--

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Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-3	27.45	Unknown	97.77	6/4/2012	25.53	72.24
				9/20/2012	17.97	79.80
				12/28/2012	DRY	--
				3/28/2013	DRY	--
				6/12/2013	24.36	73.41
				9/11/2013	17.84	79.93
				12/13/2013	DRY	--
				3/20/2014	DRY	--
				6/18/2014	25.36	72.41
				9/15/2014	18.79	78.98
				12/15/2014	DRY	--
				3/16/2015	DRY	--
				6/15/2015	27.20	70.57
				9/16/2015	22.05	75.72
				11/30/2015	26.68	71.09
				3/30/2016	DRY	--
				9/8/2016	18.75	79.02
				11/29/2016	25.53	72.24
				6/14/2017	25.52	72.25
				9/25/2017	19.62	78.15
				12/5/2017	27.31	70.46
				3/15/2018	DRY	--
				6/27/2018	25.27	72.50
				3/14/2019	27.40	70.37
				5/24/2019	DRY	--
				8/27/2019	25.42	72.35
				12/17/2019	27.30	70.47
				2/19/2020	27.37	70.40
				4/28/2020	DRY	--
				8/24/2020	25.20	72.57
				10/28/2020	22.49	75.28
				3/24/2021	DRY	--
				6/28/2021	NM	NM
				9/22/2021	NM	NM
				11/15/2021	27.24	70.53
MW-4	37.57	7.57 - 37.57	97.75	3/8/2004	36.04	61.71
				7/19/2004	8.44	89.31
				10/27/2004	19.69	78.06
				12/27/2004	27.58	70.17
				5/10/2005	DRY	--
				10/20/2005	18.87	78.88
				11/22/2005	23.93	73.82
				5/17/2006	NM	--
				11/15/2006	21.02	76.73
				2/19/2007	34.40	63.35

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NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-4	37.57	7.57 - 37.57	97.75	5/14/2007	27.56	70.19
				8/22/2007	18.18	79.57
				11/6/2007	20.48	77.27
				3/17/2008	36.08	61.67
				10/22/2008	18.96	78.79
				3/30/2009	37.36	60.39
				9/30/2009	16.15	81.60
				3/31/2010	DRY	--
				6/9/2010	23.61	74.14
				9/27/2010	19.61	78.14
				3/16/2011	DRY	--
				6/21/2011	26.79	70.96
				9/27/2011	17.47	80.28
				12/13/2011	25.35	72.40
				3/7/2012	35.73	62.02
				6/4/2012	25.39	72.36
				9/20/2012	17.43	80.32
				12/28/2012	28.02	69.73
				3/28/2013	DRY	--
				6/12/2013	24.06	73.69
				9/11/2013	17.40	80.35
				12/13/2013	27.90	69.85
				3/20/2014	DRY	--
				6/18/2014	25.10	72.65
				9/15/2014	18.43	79.32
				12/15/2014	28.01	69.74
				3/16/2015	DRY	--
				6/15/2015	26.91	70.84
				9/16/2015	21.62	76.13
				11/30/2015	26.28	71.47
				3/30/2016	37.54	60.21
				6/22/2016	25.59	72.16
				9/8/2016	18.29	79.46
				11/29/2016	25.31	72.44
				6/14/2017	25.17	72.58
				9/25/2017	19.24	78.51
				12/5/2017	27.64	70.11
				3/15/2018	37.54	60.21
				6/27/2018	24.84	72.91
				10/10/2018	22.70	75.05
				12/12/2018	29.98	67.77
				3/14/2019	37.43	60.32
				5/23/2019	33.96	63.79
				8/27/2019	25.17	72.58

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NELL HALL #1
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Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-4	37.57	7.57 - 37.57	97.75	12/16/2019	29.15	68.60
				2/20/2020	36.64	61.11
				4/29/2020	DRY	--
				8/25/2020	24.74	73.01
				10/29/2020	22.13	75.62
				3/24/2021	37.40	60.35
				6/28/2021	26.33	71.42
				9/22/2021	23.45	74.30
				11/15/2021	26.77	70.98
MW-5	42.70	7.7 - 42.7	98.81	3/8/2004	37.19	61.62
				7/19/2004	9.38	89.43
				10/27/2004	21.07	77.74
				12/27/2004	28.99	69.82
				5/10/2005	39.79	59.02
				10/20/2005	20.34	78.47
				11/22/2005	25.23	73.58
				5/17/2006	23.80	75.01
				11/15/2006	22.51	76.30
				2/19/2007	35.31	63.50
				5/14/2007	27.59	71.22
				8/22/2007	19.45	79.36
				11/6/2007	21.94	76.87
				3/17/2008	37.33	61.48
				10/22/2008	19.30	79.51
				3/30/2009	38.68	60.13
				9/30/2009	17.54	81.27
				3/31/2010	39.05	59.76
				6/9/2010	24.91	73.90
				9/27/2010	20.92	77.89
				3/16/2011	39.25	59.56
				6/21/2011	28.02	70.79
				9/27/2011	18.79	80.02
				12/13/2011	26.62	72.19
				3/7/2012	37.00	61.81
				6/4/2012	26.57	72.24
				9/20/2012	18.92	79.89
				12/28/2012	29.37	69.44
				3/28/2013	DRY	--
				6/12/2013	25.39	73.42
				9/11/2013	18.84	79.97
				12/13/2013	29.20	69.61
				3/20/2014	39.83	58.98
				6/18/2014	26.35	72.46

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-5	42.70	7.7 - 42.7	98.81	9/15/2014	19.76	79.05
				12/15/2014	29.37	69.44
				3/16/2015	39.55	59.26
				6/15/2015	28.22	70.59
				9/16/2015	23.02	75.79
				11/30/2015	27.61	71.20
				3/30/2016	41.26	57.55
				6/22/2016	26.91	71.90
				9/8/2016	19.72	79.09
				11/29/2016	26.48	72.33
				6/14/2017	26.48	72.33
				9/25/2017	20.58	78.23
				12/5/2017	29.09	69.72
				3/15/2018	40.67	58.14
				6/27/2018	26.24	72.57
				10/10/2018	23.44	75.37
				12/12/2018	31.25	67.56
				3/14/2019	41.70	57.11
				5/24/2019	34.36	64.45
				8/28/2019	26.41	72.40
				12/17/2019	30.58	68.23
				2/21/2020	38.03	60.78
				4/29/2020	39.43	59.38
				8/25/2020	26.17	72.64
				10/29/2020	23.49	75.32
				3/24/2021	41.78	57.03
				6/28/2021	27.68	71.13
				9/22/2021	24.80	74.01
				11/15/2021	28.50	70.31
MW-6	38.21	8.21 - 38.21	98.41	3/8/2004	36.27	62.14
				7/19/2004	9.43	88.98
				10/27/2004	19.33	79.08
				12/27/2004	28.62	69.79
				5/10/2005	DRY	--
				10/20/2005	19.94	78.47
				11/22/2005	25.02	73.39
				5/17/2006	NM	--
				11/15/2006	21.12	77.29
				2/19/2007	34.82	63.59
				5/14/2007	26.12	72.29
				8/22/2007	19.41	79.00
				11/6/2007	21.51	76.90
				3/17/2008	36.34	62.07

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-6	38.21	8.21 - 38.21	98.41	10/22/2008	19.99	78.42
				3/30/2009	37.04	61.37
				9/30/2009	17.26	81.15
				3/31/2010	37.24	61.17
				6/9/2010	24.43	73.98
				9/27/2010	20.79	77.62
				3/16/2011	DRY	--
				6/21/2011	27.56	70.85
				9/27/2011	18.58	79.83
				12/13/2011	26.32	72.09
				3/7/2012	36.01	62.40
				6/4/2012	26.55	71.86
				9/20/2012	18.25	80.16
				12/28/2012	29.11	69.30
				3/28/2013	DRY	--
				6/12/2013	24.78	73.63
				9/11/2013	18.26	80.15
				12/13/2013	28.84	69.57
				3/20/2014	37.47	60.94
				6/18/2014	25.93	72.48
				9/15/2014	19.35	79.06
				12/15/2014	29.02	69.39
				3/16/2015	37.37	61.04
				6/15/2015	27.92	70.49
				9/16/2015	22.40	76.01
				11/30/2015	27.22	71.19
				3/30/2016	37.81	60.60
				6/22/2016	26.75	71.66
				9/8/2016	19.27	79.14
				11/29/2016	26.20	72.21
				6/14/2017	25.97	72.44
				9/25/2017	20.04	78.37
				12/5/2017	28.63	69.78
				3/15/2018	37.76	60.65
				6/27/2018	25.67	72.74
				10/10/2018	22.97	75.44
				12/12/2018	31.12	67.29
				3/14/2019	37.84	60.57
				5/23/2019	35.26	63.15
				8/27/2019	25.83	72.58
				12/16/2019	29.41	69.00
				2/20/2020	36.41	62.00
				4/29/2020	DRY	--
				8/25/2020	25.70	72.71

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-6	38.21	8.21 - 38.21	98.41	10/28/2020	22.85	75.56
				3/24/2021	34.74	63.67
				6/28/2021	27.08	71.33
				9/22/2021	24.30	74.11
				11/15/2021	27.63	70.78
MW-7	43.02	10 - 40	97.60	9/16/2015	21.70	75.90
				11/30/2015	26.78	70.82
				3/30/2016	40.46	57.14
				6/22/2016	25.98	71.62
				9/8/2016	18.55	79.05
				11/29/2016	25.73	71.87
				6/14/2017	25.35	72.25
				9/25/2017	19.44	78.16
				12/5/2017	28.21	69.39
				3/15/2018	39.85	57.75
				6/27/2018	25.06	72.54
				10/10/2018	22.26	75.34
				12/12/2018	30.25	67.35
				3/14/2019	40.81	56.79
				5/23/2019	33.75	63.85
				8/28/2019	25.00	72.60
				12/16/2019	29.41	68.19
				2/19/2020	37.10	60.50
				4/29/2020	37.87	59.73
				8/24/2020	25.17	72.43
				10/28/2020	22.25	75.35
MW-8	42.47	9 - 39	98.87	3/24/2021	40.91	56.69
				6/28/2021	26.38	71.22
				9/22/2021	23.60	74.00
				11/15/2021	27.09	70.51
				9/16/2015	22.74	76.13
				11/30/2015	27.97	70.90
				3/30/2016	41.65	57.22
				6/22/2016	27.11	71.76
				9/8/2016	19.52	79.35
				11/29/2016	26.82	72.05
				6/14/2017	26.30	72.57
				9/25/2017	20.52	78.35
				12/5/2017	29.30	69.57
				3/15/2018	41.03	57.84
				6/27/2018	26.00	72.87
				10/10/2018	23.27	75.60
				12/12/2018	31.34	67.53

TABLE 1
WELL CONSTRUCTION INFORMATION AND GROUNDWATER ELEVATIONS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Total Depth (ft)	Screened Interval (ft bgs)	Top of Casing Elevation (ft) (1)	Sample Date	Depth to Groundwater (ft BTOC)	Groundwater Elevation (1)
MW-8	42.47	9 - 39	98.87	3/14/2019	42.00	56.87
				5/23/2019	35.12	63.75
				8/28/2019	26.03	72.84
				12/17/2019	30.42	68.45
				2/19/2020	38.11	60.76
				4/29/2020	38.32	60.55
				8/25/2020	26.32	72.55
				10/28/2020	23.41	75.46
				3/24/2021	42.00	56.87
				6/28/2021	27.30	71.57
				9/22/2021	24.60	74.27
				11/15/2021	28.58	70.29

Notes:

(1) - surface elevation based on an arbitrary datum of 100 feet

amsl - above mean sea level

bgs - below ground surface

BTOC - below top of casing

ft = feet

NM = Not measured

TABLE 2
FIELD PARAMETER RESULTS

NELL HALL #1
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-4	3/17/2015	Not sampled.						
	6/15/2015	16.01	6.78	0.635	977	2.74	-113.9	5.25
	9/16/2015	16.48	7.00	0.619	953	4.24	-83.1	7.75
	11/30/2015	15.59	7.01	0.680	1,046	2.60	-54.0	5.50
	3/30/2016	Not sampled.						
	6/22/2016	16.00	6.65	--	1,090	1.10	-109.0	6.00
	9/8/2016	16.55	7.35	0.627	965	5.03	66.3	9.50
	11/29/2016	14.79	7.34	--	935	3.87	46.0	6.00
	6/14/2017	14.81	7.02	0.688	1,043	2.14	-135.6	6.00
	9/25/2017	16.08	6.90	--	800	--	--	9.00
	12/5/2017	14.31	6.84	0.658	1,013	1.32	-153.5	5.25
	3/15/2018	No parameters collected due to low well volume.						
	6/27/2018	16.51	6.77	--	1,060	--	-102.5	6.50
	3/14/2019	No parameters collected due to low well volume						
	5/23/2019	14.40	7.10	0.510	980	--	-4.6	--
	8/27/2019	19.60	7.16	0.620	1,230	--	-3.2	--
	12/16/2019	8.40	6.40	0.590	1,200	2.68	13.5	--
	2/20/2020	15.80	6.36	0.650	1,300	8.19	-2.6	--
	4/29/2020	No parameters collected due to low well volume						
	8/25/2020	22.40	6.18	0.640	1,290	1.04	16.2	--
	10/29/2020	17.20	6.59	0.570	1,140	4.63	-13.1	--
	3/24/2021	No parameter or samples collected due to low well volume						
	6/28/2021	No parameters collected due to equipment failure						
	9/22/2021	17.90	6.96	--	2,950	--	--	6.60
	11/15/2021	16.90	6.35	--	1,090	--	--	5.25
MW-5	3/17/2015	No parameters or sample collected due to low well volume.						
	6/15/2015	15.28	7.08	0.576	886	6.83	10.2	7.00
	9/16/2015	15.99	6.72	0.598	920	7.33	34.9	9.75
	11/30/2015	16.24	6.84	1.118	1,721	5.52	-50.5	7.75
	3/30/2016	No parameters collected due to low well volume.						
	6/22/2016	15.70	7.02	--	1,120	5.87	2.0	7.75
	9/8/2016	15.78	7.82	0.550	846	7.91	54.3	11.25
	11/29/2016	15.47	7.17	--	1,198	8.96	74.8	8.00
	6/14/2017	14.22	7.05	0.914	1,406	6.88	-80.1	8.00
	9/25/2017	15.60	6.83	--	947	--	--	9.00
	12/5/2017	15.16	7.05	0.888	1,367	4.66	-82.9	6.50
	3/15/2018	15.53	7.13	--	1,301	1.23	78.4	--
	6/27/2018	15.84	7.11	--	1,098	6.80	65.6	8.25
	3/14/2019	14.40	7.20	0.670	1,340	--	-15.6	--
	5/24/2019	14.40	7.17	0.560	1,130	--	-22.6	--
	8/28/2019	19.10	7.02	0.680	1,360	--	-20.2	--
	12/17/2019	10.20	6.57	0.640	1,250	7.16	-31.7	--
	2/21/2020	12.40	6.50	0.570	1,210	--	-30.5	--
	4/29/2020	20.70	6.71	0.530	1,060	4.04	-19.9	--
	8/25/2020	23.40	6.86	0.600	1,180	2.71	-15.6	--
	10/28/2020	17.50	6.54	0.670	1,330	4.46	-8.6	--
	3/24/2021	13.00	6.68	0.580	1,190	--	-21.7	--
	6/28/2021	No parameters collected due to equipment failure						
	9/22/2021	19.70	7.07	--	3,820	--	--	8.85
	11/15/2021	17.70	6.27	--	1,230	--	--	7.00
MW-6	3/17/2015	Not sampled.						
	6/15/2015	15.34	6.50	0.730	1,124	4.15	-95.9	5.25
	9/16/2015	15.69	6.13	0.846	1,302	2.92	-121.5	7.75
	11/30/2015	15.36	6.57	0.793	1,221	4.82	-72.4	5.50
	3/30/2016	Not sampled.						

TABLE 2
FIELD PARAMETER RESULTS

NELL HALL #1
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-6	6/22/2016	15.30	6.50	--	1,220	1.42	-91.4	5.75
	9/8/2016	15.51	7.43	0.849	1,307	1.86	-138.7	9.25
	11/29/2016	15.29	6.86	--	1,132	2.57	-86.1	6.00
	6/14/2014	14.10	6.73	0.775	1,192	2.02	-115.1	6.00
	9/25/2017	14.86	6.30	--	1,342	--	--	11.00
	12/5/2017	13.91	6.68	0.794	1,222	0.80	-155.0	4.75
	3/15/2018	15.21	6.78	--	1,553	--	-139.2	--
	6/27/2018	16.31	6.91	--	1,195	0.52	-125	6.50
	3/14/2019	No parameter or samples collected due to low well volume						
	5/23/2019	No parameters or samples collected due to low well level						
	8/27/2019	20.60	6.73	0.580	1,160	--	13.7	--
	12/16/2019	9.50	6.13	0.590	1,150	5.15	12.2	--
	2/20/2020	15.40	6.04	0.670	1,340	--	11.1	--
	4/29/2020	No parameters collected due to low well volume						
	8/25/2020	25.70	6.25	0.660	1,330	1.32	25.8	--
	10/28/2020	15.50	6.22	0.790	1,590	5.49	15.3	--
	3/24/2021	No parameter or samples collected due to low well volume						
	6/28/2021	No parameters collected due to equipment failure						
	9/22/2021	18.10	6.98	--	3,980	--	--	6.60
	11/15/2021	16.80	5.83	--	1,200	--	--	5.00
MW-7	9/16/2015	15.07	6.52	0.581	893	7.15	72.8	10.25
	11/30/2015	15.01	6.69	1.067	1,641	4.99	21.0	7.75
	3/30/2016	16.77	6.91	0.800	1,250	6.03	40.0	1.25
	6/22/2016	15.30	6.93	--	1,090	1.22	53.5	8.25
	9/8/2016	16.29	7.62	0.441	679	7.49	5.6	11.50
	11/29/2016	14.11	7.07	--	1,006	6.35	85.7	8.00
	6/14/2017	13.95	6.82	0.809	1,245	4.88	-78.6	8.50
	9/25/2017	13.87	6.91	--	808	--	--	--
	12/5/2017	14.11	6.93	0.615	946	3.11	-82.8	7.00
	3/15/2018	15.26	6.91	--	1,037	1.09	77.1	--
	6/27/2018	15.07	6.95	--	887	5.60	42.5	8.75
	3/14/2019	12.20	7.40	0.510	--	--	-5.3	--
	5/23/2019	15.50	7.15	0.490	1,550	--	-8.8	--
	8/28/2019	18.00	7.08	0.440	880	--	-17.8	--
	12/16/2019	8.20	6.41	0.520	1,050	2.85	-39.1	--
	2/19/2020	14.70	6.46	0.570	1,120	9.25	-10.6	--
	4/29/2020	13.00	6.42	0.530	1,070	2.96	-6.5	--
	8/24/2020	19.80	6.51	0.510	1,020	2.17	-6.1	--
	10/28/2020	10.90	6.55	0.650	1,290	5.21	-12.4	--
	3/24/2021	10.90	6.55	0.650	1,290	5.21	-12.4	--
	6/28/2021	No parameters collected due to equipment failure						
	9/22/2021	20.30	7.13	--	2,590	--	--	9.43
	11/15/2021	16.60	6.11	--	1,410	--	--	7.5
MW-8	9/16/2015	14.18	6.65	0.534	821	6.37	73.2	9.75
	11/30/2015	13.85	7.20	0.565	869	4.59	-13.8	7.00
	3/30/2016	No parameters collected due to low well volume.						
	6/22/2016	14.70	7.04	--	970	0.66	-22.6	7.50
	9/8/2016	13.99	7.82	0.550	847	7.95	15.0	11.25
	11/29/2016	13.71	7.24	--	883	8.81	89.1	7.50
	6/14/2017	13.36	7.43	0.549	844	7.71	-71.9	7.75
	9/25/2017	12.78	6.73	--	823	--	--	11.00
	12/5/2017	12.36	7.09	0.509	783	2.53	-83.5	6.50
	3/15/2018	14.52	7.12	--	915	0.00	-135.0	--
	6/27/2018	14.48	7.14	--	748	5.57	62.2	8.00

TABLE 2
FIELD PARAMETER RESULTS

NELL HALL #1
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-8	3/14/2019	No parameter or samples collected due to low well levels						
	5/23/2019	18.40	7.47	0.470	910	--	-30.3	--
	8/28/2019	18.40	7.07	0.480	960	--	-15.4	--
	12/17/2019	6.60	6.80	0.400	800	--	-36.6	--
	2/19/2020	15.30	6.21	0.440	880	9.57	-18.0	--
	4/29/2020	15.30	6.46	0.420	850	2.61	-10.1	--
	8/25/2020	23.00	6.62	0.480	970	2.04	-14	--
	10/28/2020	13.40	6.59	0.460	910	4.72	-19.8	--
	3/24/2021	No parameter or samples collected due to low well levels						
	6/28/2021	No parameters collected due to equipment failure						
	9/22/2021	17.10	7.14	--	2,650	--	--	6.27
	11/15/2021	13.10	6.24	--	890	--	--	6.75

Notes:

- mg/L - milligrams per liter
- uS/cm - microsiemens per centimeter
- °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

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)
NMWQCC Standards			0.005	1.0	0.70	0.62	1.0
MW-4	MW-4	3/8/2004	0.013	0.012	0.064	1.4	--
	MW-4	7/19/2004	< 0.0005	< 0.0005	< 0.0005	< 0.0005	--
	MW-4	10/27/2004	0.011	0.008	0.021	0.13	--
	MW-4	12/27/2004	< 0.0025	< 0.0025	< 0.0025	< 0.0005	--
	MW-4	11/22/2005	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-4	11/15/2006	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-4	2/21/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-4	8/22/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-4	11/6/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-4	3/17/2008	< 0.005	< 0.005	< 0.005	< 0.005	--
	MW-4	10/22/2008	< 0.005	< 0.005	< 0.005	< 0.005	--
	MW-4	9/30/2009	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	MW-4	6/9/2010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	MW-4	9/27/2010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	GW-74941-062111-CMB-001	6/21/2011	< 0.001	< 0.001	< 0.001	< 0.003	1.21
	GW-074941-092711-CM-007	9/27/2011	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-121311-CB-MW-4	12/13/2011	< 0.001	< 0.001	< 0.001	< 0.003	0.201
	GW-074941-3712-CB-MW-4	3/7/2012	< 0.001	< 0.001	< 0.001	< 0.003	< 0.25
	GW-074941-060412-CB-MW-4	6/4/2012	< 0.001	< 0.001	< 0.001	< 0.003	1.17
	GW-074941-092012-JP-MW-4	9/20/2012	< 0.001	< 0.001	< 0.001	< 0.003	< 0.25
	GW-074941-122812-JMK-MW4	12/28/2012	< 0.001	< 0.001	< 0.001	< 0.003	0.748
	074941-061213-JK-MW4	6/12/2013	< 0.001	< 0.001	< 0.001	< 0.003	1.46
	GW-074941-091113-CM-MW-4	9/11/2013	< 0.001	< 0.001	< 0.001	< 0.003	<0.050
	GW-074941-122323-CM-MW4	12/13/2013	< 0.001	< 0.001	< 0.001	< 0.003	0.758
	GW-074941-061814-CK-MW-4	6/18/2014	< 0.001	< 0.001	< 0.001	< 0.003	1.83
	GW-074941-091514-CB-MW-4	9/15/2014	< 0.001	< 0.001	< 0.001	< 0.003	0.0544
	GW-074941-121514-CM-MW-4	12/15/2014	< 0.001	< 0.001	< 0.001	< 0.003	0.456
	GW-074941-061515-CB-MW-4	6/15/2015	< 0.001	< 0.001	< 0.001	< 0.003	1.78
	GW-074941-091615-CK-MW-4	9/16/2015	< 0.001	< 0.001	< 0.001	< 0.003	0.225
	GW-074941-113015-CB-MW-4	11/30/2015	< 0.001	< 0.001	< 0.001	< 0.003	0.58
	---	3/30/2016	No samples collected due to low well levels				
	GW-074941-062216-SP-MW-4	06/22/2016	< 0.001	< 0.001	< 0.001	< 0.003	2.07
	GW-074941-090816-SP-MW-4	09/08/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-112916-CN-MW-4	11/29/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-061417-CN-MW-4	06/14/2017	< 0.001	< 0.001	< 0.001	< 0.003	1.03
	GW-11146004-092517-CN-MW-4	9/25/2017	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-11146004-120517-SP-MW-4	12/05/2017	< 0.001	< 0.001	< 0.001	< 0.003	0.564
	GW-11146004-031518-JW-MW-4	3/15/2018	No samples collected due to low well levels				
	GW-11146004-062718-CM-MW-4	6/27/2018	< 0.001	< 0.001	< 0.001	< 0.003	1.39
	MW-4	10/10/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-4	12/12/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	---	3/14/2019	No samples collected due to low well levels				
	MW-4	5/23/2019	--	--	--	--	<0.10
	MW-4	8/27/2019	--	--	--	--	<0.10
	MW-4	12/16/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-4	2/19/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	---	4/29/2020	No samples collected due to low well levels				
	MW-4	8/25/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-4	10/29/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	---	3/24/2021	No samples collected due to low well levels				
	MW-4	6/28/2021	< 0.0025	< 0.0025	< 0.0025	< 0.005	1.9
	MW-4	9/22/2021	< 0.001	< 0.001	< 0.001	< 0.002	< 0.02
	MW-4	11/12/2021	< 0.001	< 0.001	< 0.001	< 0.015	< 0.02
MW-5	MW-5	3/8/2004	0.0011	< 0.0005	0.001	0.017	--
	MW-5	7/19/2004	< 0.0005	0.00055	< 0.0005	0.00072	--
	MW-5	10/27/2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	--
	MW-5	12/27/2004	< 0.0005	< 0.0005	< 0.0005	< 0.001	--
	MW-5	5/11/2005	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-5	11/22/2005	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-5	11/15/2006	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-5	2/21/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-5	8/22/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-5	11/6/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-5	3/17/2008	< 0.005	< 0.005	< 0.005	< 0.005	--
	MW-5	10/22/2008	< 0.005	< 0.005	< 0.005	< 0.005	--
	MW-5	3/30/2009	< 0.005	< 0.005	< 0.005	< 0.005	--
	MW-5	9/30/2009	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	MW-5	3/31/2010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	MW-5	6/9/2010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	MW-5	9/27/2010	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	MW-5	3/16/2011	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
	GW-74941-062111-CMB-002	6/21/2011	< 0.001	< 0.001	< 0.001	< 0.003	< 0.1
	GW-074941-092711-CM-005	9/27/2011	< 0.001	< 0.001	< 0.001	< 0.003	0.0835
	GW-074941-121311-CB-MW-5	12/13/2011	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-3712-CB-MW-5	3/7/2012	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)
NMWQCC Standards			0.005	1.0	0.70	0.62	1.0
MW-5	GW-074941-060412-CB-MW-5	6/4/2012	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-092012-JP-MW-5	9/20/2012	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-122812-JMK-MW5	12/28/2012	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	074941-061213-JK-MW5	6/12/2013	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-091113-CM-MW-5	9/11/2013	< 0.001	< 0.001	< 0.001	< 0.003	0.0723
	GW-074941-122323-CM-MW5	12/13/2013	< 0.001	< 0.001	< 0.001	< 0.003	0.076
	GW-074941-032114-CK-MW-5	3/21/2014	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-061814-CK-MW-5	6/18/2014	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-091514-CB-MW-5	9/15/2014	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-121514-CM-MW-5	12/15/2014	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-031715-CM-MW-5	3/17/2015	< 0.001	< 0.001	< 0.001	< 0.003	--
	GW-074941-061515-CB-MW-5	6/15/2015	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-091615-CK-MW-5	9/16/2015	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-113015-CB-MW-5	11/30/2015	< 0.001	< 0.001	< 0.001	< 0.003	0.0684
	GW-074941-033016-CM-MW-5	3/30/2016	< 0.001	< 0.001	< 0.001	< 0.003	--
	GW-074941-062216-SP-MW-5	6/22/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-090816-SP-MW-5	09/08/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-112916-CN-MW-5	11/29/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-061417-CNMW-5	06/14/2017	< 0.001	< 0.001	< 0.001	< 0.003	0.133
	GW-11146004-092517-CN-MW-5	9/25/2017	0.147	< 0.001	0.0264	0.0135	0.0568
	GW-11146004-120517-SP-MW-5	12/05/2017	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-11146004-031518-JW-MW-5	3/15/2018	< 0.001	< 0.001	< 0.001	< 0.003	0.0795
	GW-11146004-062718-JW-MW-5	6/27/2018	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	MW-5	10/10/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	12/12/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	3/14/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	5/24/2019	--	--	--	--	<0.10
	MW-5	8/28/2019	--	--	--	--	<0.10
	MW-5	12/17/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	2/21/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	4/29/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	8/25/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	10/29/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	3/24/2021	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-5	6/28/2021	< 0.0025	< 0.0025	< 0.0025	< 0.005	< 0.02
	MW-5	9/22/2021	< 0.001	< 0.001	< 0.001	< 0.002	< 0.02
	MW-5	11/15/2021	< 0.001	< 0.001	< 0.001	< 0.0015	< 0.02
MW-6	MW-6	3/8/2004	2.5	0.014	1.6	21.031	--
	MW-6	7/19/2004	< 0.0005	< 0.0005	0.00098	0.0026	--
	MW-6	10/27/2004	0.0004	0.0003	0.0005	0.0021	--
	MW-6	12/27/2004	0.045	0.0068	0.014	0.0717	--
	MW-6	11/22/2005	0.01	0.0007	0.016	0.15	--
	MW-6	11/15/2006	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-6	2/21/2007	0.54	< 0.001	0.076	0.81	--
	MW-6	8/22/2007	< 0.0005	< 0.0007	< 0.0008	< 0.0008	--
	MW-6	11/6/2007	0.015	< 0.0007	0.047	0.39	--
	MW-6	3/18/2008	0.16	< 0.005	< 0.005	0.033	--
	MW-6	10/22/2008	< 0.005	< 0.005	< 0.005	< 0.005	--
	MW-6	3/30/2009	0.042	< 0.005	< 0.005	0.01	--
	MW-6	9/30/2009	0.096	0.0047	0.062	0.12	1.06
	MW-6	4/1/2010	0.48	< 0.001	0.078	0.2	--
	MW-6	6/9/2010	0.71	< 0.001	0.42	0.52	11.4
	MW-6	9/27/2010	0.30	< 0.001	0.25	0.41	0.676
	MW-6	3/16/2011	0.18	< 0.001	0.044	0.072	8.66
	GW-74941-062111-CMB-003	6/21/2011	0.461	0.00048	0.454	0.677	9.45
	GW-074941-092711-CM-006	9/27/2011	0.237	< 0.005	0.197	0.225	19.6
	GW-074941-121311-CB-MW-6	12/13/2011	0.298	0.0083	0.154	0.141	11.6
	GW-074941-3712-CB-MW-6	3/7/2012	0.0477	< 0.001	0.0073	0.0192	22.5
	GW-074941-060412-CB-MW-6	6/4/2012	0.649	< 0.01	0.309	0.314	19.2
	GW-074941-092012-JP-MW-6	9/20/2012	0.266	< 0.005	0.065	0.0355	9.53
	GW-074941-122812-JMK-MW6	12/28/2012	0.319	< 0.005	0.0764	0.0452	8.06
	074941-061213-JK-MW6	6/12/2013	0.442	< 0.005	0.159	0.209	16.6
	GW-074941-091113-CM-MW-6	9/11/2013	0.109	< 0.001	0.0208	0.0123	2.26
	GW-074941-122323-CM-MW6	12/13/2013	0.467	< 0.001	0.101	0.0537	5.9
	GW-074941-061814-CK-MW-6	6/18/2014	0.384	< 0.005	0.152	0.177	15.5
	GW-074941-091514-CB-MW-6	9/15/2014	0.502	< 0.001	0.101	0.064	7.75
	GW-074941-121514-CM-MW-6	12/15/2014	0.333	< 0.001	0.0758	0.0249	5.45

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)
NMWQCC Standards			0.005	1.0	0.70	0.62	1.0
MW-6	GW-074941-061515-CB-MW-6	6/15/2015	0.354	< 0.005	0.167	0.222	13.1
	GW-074941-091615-CK-MW-6	9/16/2015	0.294	< 0.005	0.134	0.0615	11
	GW-074941-113015-CB-MW-6	11/30/2015	0.413	< 0.01	0.0642	< 0.03	7.35
	---	3/30/2016	No samples collected due to low well levels				
	GW-074941-062216-SP-MW-6	6/22/2016	0.419	< 0.010	0.0718	0.0435	16.2
	GW-074941-090816-SP-MW-6	09/08/2016	0.209	< 0.005	0.0339	< 0.015	6.07
	GW-074941-112916-CN-MW-6	11/29/2016	0.257	< 0.005	0.0649	0.0203	6.32
	GW-074941-061417-CN-MW-6	06/14/2017	0.309	< 0.005	0.103	0.0916	10.6
	GW-11146004-092517-CN-MW-6	9/25/2017	0.157	< 0.001	0.0286	0.0145	5.73
	GW-11146004-120517-SP-MW-6	12/05/2017	0.236	< 0.001	0.0243	0.007	7.58
	GW-11146004-031518-JW-MW-6	3/15/2018	0.389	< 0.001	0.0544	0.0376	--
	GW-11146004-062718-JW-MW-6	6/27/2018	0.389	< 0.001	0.0683	0.0427	10.00
	MW-6	10/10/2018	0.0125	< 0.001	0.0038	< 0.003	1.68
	MW-6	12/12/2018	0.146	< 0.001	0.00285	< 0.003	1.66
	MW-6	3/14/2019	No samples collected due to low well levels				
	MW-6	5/23/2019	0.164	< 0.001	0.0926	0.0377	3.05
	MW-6	8/27/2019	0.187	< 0.001	0.0479	0.00321	3.54
	MW-6	12/16/2019	0.222	< 0.001	0.0149	< 0.003	0.344
	MW-6	2/20/2020	0.121	< 0.001	0.0046	< 0.003	1.65
	MW-6	4/29/2020	No samples collected due to low well levels				
	MW-6	8/25/2020	0.295	< 0.001	0.0123	< 0.003	2.8
	MW-6	10/28/2020	0.112	< 0.001	< 0.001	< 0.003	1.55
	MW-6	3/24/2021	No samples collected due to low well levels				
	MW-6	6/28/2021	0.073	< 0.0025	0.065	< 0.005	12
	MW-6	9/22/2021	0.0033	< 0.001	0.0054	< 0.002	2.5
	MW-6	11/12/2021	0.14	< 0.001	0.0047	< 0.0015	0.99
MW-7	GW-074941-091615-CK-MW-7	9/16/2015	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-113015-CB-MW-7	11/30/2015	< 0.001	< 0.001	< 0.001	< 0.003	0.0637
	GW-074941-033016-CM-MW-7	3/30/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.50
	GW-074941-062216-SP-MW-7	6/22/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.50
	GW-074941-090816-SP-MW-7	09/08/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-112916-CN-MW-7	11/29/2016	< 0.001	< 0.001	< 0.001	< 0.003	<0.05
	GW-074941-061417-CN-MW-7	06/14/2017	< 0.001	< 0.001	< 0.001	< 0.003	<0.05
	GW-11146004-902517-CN-MW-7	9/25/2017	< 0.001	< 0.001	< 0.001	< 0.003	<0.05
	GW-11146004-120517-SP-MW-7	12/05/2017	< 0.001	< 0.001	< 0.001	< 0.003	<0.05
	GW-11146004-031518-JW-MW-7	3/15/2018	< 0.001	< 0.001	< 0.001	< 0.003	0.0936
	GW-11146004-062718-CM-MW-7	6/27/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.05
	MW-7	10/10/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	12/11/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	3/14/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	5/23/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	8/28/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	12/16/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	2/19/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	4/29/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	8/24/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	10/28/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	3/24/2021	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-7	6/28/2021	< 0.0025	< 0.0025	< 0.0025	< 0.005	< 0.020
	MW-7	9/22/2021	< 0.001	< 0.001	< 0.001	< 0.002	<0.020
	MW-7	11/12/2021	< 0.001	< 0.001	< 0.001	< 0.0015	<0.020
MW-8	GW-074941-091615-CK-MW-8	9/16/2015	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-113015-CB-MW-8	11/30/2015	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-033016-CM-MW-8	3/30/2016	< 0.001	< 0.001	< 0.001	< 0.003	0.412
	GW-074941-062216-SP-MW-8	6/22/2016	< 0.001	< 0.001	< 0.001	< 0.003	0.0753
	GW-074941-090816-SP-MW-8	09/08/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-112916-CN-MW-8	11/29/2016	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-074941-061417-CN-MW-8	06/14/2017	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-11146006-092517-CN-MW-8	9/25/2017	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-11146004-120517-SP-MW-8	12/5/2017	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	GW-11146004-031518-JW-MW-8	3/15/2018	< 0.001	< 0.001	< 0.001	< 0.003	0.237
	GW-11146004-062718-CM-MW-8	6/27/2018	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	MW-8	10/10/2018	< 0.001	< 0.001	< 0.001	< 0.003	< 0.05
	MW-8	12/11/2018	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	---	3/14/2019	No samples collected due to low well levels				
	MW-8	5/23/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-8	8/28/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-8	12/17/2019	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-8	2/19/2020	< 0.001	< 0.001	< 0.001	< 0.003	0.126
	MW-8	4/29/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-8	8/24/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	MW-8	10/28/2020	< 0.001	< 0.001	< 0.001	< 0.003	<0.10
	---	3/24/2021	No samples collected due to low well levels				

TABLE 3
PETROLEUM HYDROCARBON GROUNDWATER ANALYTICAL RESULTS

NELL HALL #1
SAN JUAN COUNTY, NEW MEXICO
HILCORP ENERGY COMPANY

Well ID	Sample ID	Sample Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (total) (mg/L)	Iron (dissolved) (mg/L)
NMWQCC Standards			0.005	1.0	0.70	0.62	1.0
MW-8	MW-8	6/28/2021	< 0.0025	< 0.0025	< 0.0025	< 0.005	<0.020
	MW-8	9/22/2021	< 0.001	< 0.001	< 0.001	< 0.002	<0.020
	MW-8	11/15/2021	< 0.001	< 0.001	< 0.001	< 0.0015	<0.020

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

ENCLOSURE A – ANALYTICAL LABORATORY REPORT



ANALYTICAL REPORT

April 06, 2021

HilCorp-Farmington, NM

Sample Delivery Group: L1331155
Samples Received: 03/26/2021
Project Number:
Description: Nell Hall #1
Site: NELL HALL #1
Report To: Kurt Hoekstra
382 Road 3100
Aztec, NM 87401

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

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.

Pace Analytical National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

Cp: Cover Page	1	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
MW5 L1331155-01	5	
MW7 L1331155-02	6	⁴ Cn
Qc: Quality Control Summary	7	⁵ Sr
Metals (ICP) by Method 6010B	7	
Volatile Organic Compounds (GC/MS) by Method 8260B	8	⁶ Qc
Gl: Glossary of Terms	9	⁷ Gl
Al: Accreditations & Locations	10	⁸ Al
Sc: Sample Chain of Custody	11	⁹ Sc

MW5 L1331155-01 GW

				Collected by Kurt	Collected date/time 03/24/21 14:45	Received date/time 03/26/21 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1643116	1	04/01/21 02:20	04/01/21 09:23	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1641532	1	03/27/21 21:17	03/27/21 21:17	TPR	Mt. Juliet, TN

MW7 L1331155-02 GW

				Collected by Kurt	Collected date/time 03/24/21 13:30	Received date/time 03/26/21 09:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1643116	1	04/01/21 02:20	04/01/21 09:26	CCE	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1641532	1	03/27/21 21:38	03/27/21 21:38	TPR	Mt. Juliet, TN

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

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

- ¹ Cp
- ² Tc
- ³ Ss
- ⁴ Cn
- ⁵ Sr
- ⁶ Qc
- ⁷ Gl
- ⁸ Al
- ⁹ Sc

Collected date/time: 03/24/21 14:45

L1331155

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Iron,Dissolved	ND		0.100	1	04/01/2021 09:23	WG1643116

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	03/27/2021 21:17	WG1641532
Toluene	ND		0.00100	1	03/27/2021 21:17	WG1641532
Ethylbenzene	ND		0.00100	1	03/27/2021 21:17	WG1641532
Total Xylenes	ND		0.00300	1	03/27/2021 21:17	WG1641532
(S) Toluene-d8	102		80.0-120		03/27/2021 21:17	WG1641532
(S) 4-Bromofluorobenzene	102		77.0-126		03/27/2021 21:17	WG1641532
(S) 1,2-Dichloroethane-d4	82.7		70.0-130		03/27/2021 21:17	WG1641532

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Collected date/time: 03/24/21 13:30

L1331155

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Iron,Dissolved	ND		0.100	1	04/01/2021 09:26	WG1643116

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

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	03/27/2021 21:38	WG1641532
Toluene	ND		0.00100	1	03/27/2021 21:38	WG1641532
Ethylbenzene	ND		0.00100	1	03/27/2021 21:38	WG1641532
Total Xylenes	ND		0.00300	1	03/27/2021 21:38	WG1641532
(S) Toluene-d8	99.1		80.0-120		03/27/2021 21:38	WG1641532
(S) 4-Bromofluorobenzene	98.6		77.0-126		03/27/2021 21:38	WG1641532
(S) 1,2-Dichloroethane-d4	81.4		70.0-130		03/27/2021 21:38	WG1641532

Metals (ICP) by Method 6010B [L1331155-01.02](#)

Method Blank (MB)

(MB) R3637084-1 04/01/21 08:49

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Iron,Dissolved	U		0.0180	0.100

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Laboratory Control Sample (LCS)

(LCS) R3637084-2 04/01/21 08:51

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Iron,Dissolved	10.0	9.27	92.7	80.0-120	

L1331416-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1331416-01 04/01/21 08:54 • (MS) R3637084-4 04/01/21 09:00 • (MSD) R3637084-5 04/01/21 09:03

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 %
Iron,Dissolved	10.0	ND	9.21	9.42	91.9	94.0	1	75.0-125			2.27	20

Method Blank (MB)

(MB) R3637213-1 03/27/21 19:34

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	107			80.0-120
(S) 4-Bromofluorobenzene	103			77.0-126
(S) 1,2-Dichloroethane-d4	83.9			70.0-130

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

Laboratory Control Sample (LCS)

(LCS) R3637213-2 03/27/21 19:55

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Benzene	0.00500	0.00566	113	70.0-123	
Ethylbenzene	0.00500	0.00519	104	79.0-123	
Toluene	0.00500	0.00494	98.8	79.0-120	
Xylenes, Total	0.0150	0.0150	100	79.0-123	
(S) Toluene-d8			103	80.0-120	
(S) 4-Bromofluorobenzene			101	77.0-126	
(S) 1,2-Dichloroethane-d4			83.4	70.0-130	

⁶Qc

⁷Gl

⁸Al

⁹Sc

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.

QualifierDescription

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002
California	2932	New Mexico ¹	TN00003
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	LA000356
Kentucky ^{1 6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
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		

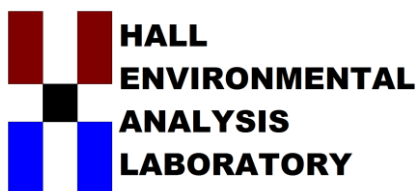
¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* 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 Analytical.

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc

Released to Imaging: 5/17/2024 3:13:16 PM



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

July 14, 2021

Stuart Hyde
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX

RE: Nell Hall 1

OrderNo.: 2106E89

Dear Stuart Hyde:

Hall Environmental Analysis Laboratory received 5 sample(s) on 6/29/2021 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2106E89

Date Reported: 7/14/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-4

Project: Nell Hall 1

Collection Date: 6/28/2021 10:00:00 AM

Lab ID: 2106E89-001

Matrix: GROUNDWA

Received Date: 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	1.9	0.10	*	mg/L	5	7/1/2021 10:13:35 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	2.5	D	µg/L	5	6/30/2021 9:54:20 PM
Toluene	ND	2.5	D	µg/L	5	6/30/2021 9:54:20 PM
Ethylbenzene	ND	2.5	D	µg/L	5	6/30/2021 9:54:20 PM
Xylenes, Total	ND	5.0	D	µg/L	5	6/30/2021 9:54:20 PM
Surr: 1,2-Dichloroethane-d4	108	70-130	D	%Rec	5	6/30/2021 9:54:20 PM
Surr: Dibromofluoromethane	101	70-130	D	%Rec	5	6/30/2021 9:54:20 PM
Surr: Toluene-d8	96.6	70-130	D	%Rec	5	6/30/2021 9:54:20 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 1 of 7

Analytical Report

Lab Order 2106E89

Date Reported: 7/14/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-5

Project: Nell Hall 1

Collection Date: 6/28/2021 10:30:00 AM

Lab ID: 2106E89-002

Matrix: GROUNDWA

Received Date: 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	ND	0.020		mg/L	1	7/1/2021 9:49:11 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	2.5	D	µg/L	5	6/30/2021 10:21:35 PM
Toluene	ND	2.5	D	µg/L	5	6/30/2021 10:21:35 PM
Ethylbenzene	ND	2.5	D	µg/L	5	6/30/2021 10:21:35 PM
Xylenes, Total	ND	5.0	D	µg/L	5	6/30/2021 10:21:35 PM
Surr: 1,2-Dichloroethane-d4	105	70-130	D	%Rec	5	6/30/2021 10:21:35 PM
Surr: Dibromofluoromethane	104	70-130	D	%Rec	5	6/30/2021 10:21:35 PM
Surr: Toluene-d8	98.2	70-130	D	%Rec	5	6/30/2021 10:21:35 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 2 of 7

Analytical Report

Lab Order 2106E89

Date Reported: 7/14/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-6

Project: Nell Hall 1

Collection Date: 6/28/2021 11:45:00 AM

Lab ID: 2106E89-003

Matrix: GROUNDWA

Received Date: 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	12	0.40	*	mg/L	20	7/1/2021 10:24:05 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	73	2.5	D	µg/L	5	6/30/2021 10:48:48 PM
Toluene	ND	2.5	D	µg/L	5	6/30/2021 10:48:48 PM
Ethylbenzene	65	2.5	D	µg/L	5	6/30/2021 10:48:48 PM
Xylenes, Total	ND	5.0	D	µg/L	5	6/30/2021 10:48:48 PM
Surr: 1,2-Dichloroethane-d4	92.4	70-130	D	%Rec	5	6/30/2021 10:48:48 PM
Surr: Dibromofluoromethane	87.7	70-130	D	%Rec	5	6/30/2021 10:48:48 PM
Surr: Toluene-d8	98.3	70-130	D	%Rec	5	6/30/2021 10:48:48 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 3 of 7

Analytical Report

Lab Order 2106E89

Date Reported: 7/14/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-7

Project: Nell Hall 1

Collection Date: 6/28/2021 11:15:00 AM

Lab ID: 2106E89-004

Matrix: GROUNDWA

Received Date: 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	ND	0.020		mg/L	1	7/1/2021 9:52:07 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	2.5	D	µg/L	5	6/30/2021 11:15:57 PM
Toluene	ND	2.5	D	µg/L	5	6/30/2021 11:15:57 PM
Ethylbenzene	ND	2.5	D	µg/L	5	6/30/2021 11:15:57 PM
Xylenes, Total	ND	5.0	D	µg/L	5	6/30/2021 11:15:57 PM
Surr: 1,2-Dichloroethane-d4	112	70-130	D	%Rec	5	6/30/2021 11:15:57 PM
Surr: Dibromofluoromethane	110	70-130	D	%Rec	5	6/30/2021 11:15:57 PM
Surr: Toluene-d8	97.1	70-130	D	%Rec	5	6/30/2021 11:15:57 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order 2106E89

Date Reported: 7/14/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-8

Project: Nell Hall 1

Collection Date: 6/28/2021 10:50:00 AM

Lab ID: 2106E89-005

Matrix: GROUNDWA

Received Date: 6/29/2021 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	ND	0.020		mg/L	1	7/1/2021 9:53:42 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	2.5	D	µg/L	5	6/30/2021 11:43:06 PM
Toluene	ND	2.5	D	µg/L	5	6/30/2021 11:43:06 PM
Ethylbenzene	ND	2.5	D	µg/L	5	6/30/2021 11:43:06 PM
Xylenes, Total	ND	5.0	D	µg/L	5	6/30/2021 11:43:06 PM
Surr: 1,2-Dichloroethane-d4	105	70-130	D	%Rec	5	6/30/2021 11:43:06 PM
Surr: Dibromofluoromethane	100	70-130	D	%Rec	5	6/30/2021 11:43:06 PM
Surr: Toluene-d8	98.7	70-130	D	%Rec	5	6/30/2021 11:43:06 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2106E89

14-Jul-21

Client: HILCORP ENERGY**Project:** Nell Hall 1

Sample ID: MB	SampType: MBLK	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: PBW	Batch ID: B79507	RunNo: 79507								
Prep Date:	Analysis Date: 7/1/2021	SeqNo: 2795409 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID: LL LCS	SampType: LCSLL	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: BatchQC	Batch ID: B79507	RunNo: 79507								
Prep Date:	Analysis Date: 7/1/2021	SeqNo: 2795410 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.021	0.020	0.02000	0	103	50	150			

Sample ID: LCS	SampType: LCS	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: LCSW	Batch ID: B79507	RunNo: 79507								
Prep Date:	Analysis Date: 7/1/2021	SeqNo: 2795411 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.52	0.020	0.5000	0	104	85	115			

Sample ID: 2106E89-001BMS	SampType: MS	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: MW-4	Batch ID: B79507	RunNo: 79507								
Prep Date:	Analysis Date: 7/1/2021	SeqNo: 2795467 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.2	0.10	2.500	1.882	92.6	70	130			

Sample ID: 2106E89-001BM SD	SampType: MSD	TestCode: EPA Method 200.7: Dissolved Metals								
Client ID: MW-4	Batch ID: B79507	RunNo: 79507								
Prep Date:	Analysis Date: 7/1/2021	SeqNo: 2795471 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	4.2	0.10	2.500	1.882	94.6	70	130	1.16	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

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QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2106E89

14-Jul-21

Client: HILCORP ENERGY**Project:** Nell Hall 1

Sample ID: 100ng lcs	SampType: LCS			TestCode: EPA Method 8260: Volatiles Short List						
Client ID: LCSW	Batch ID: SL79505			RunNo: 79505						
Prep Date:	Analysis Date: 6/30/2021			SeqNo: 2795310		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	105	70	130			
Toluene	20	1.0	20.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		110	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.8		10.00		97.9	70	130			

Sample ID: mb	SampType: MBLK			TestCode: EPA Method 8260: Volatiles Short List						
Client ID: PBW	Batch ID: SL79505			RunNo: 79505						
Prep Date:	Analysis Date: 6/30/2021			SeqNo: 2795324		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		108	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	9.8		10.00		98.5	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2106E89

RcptNo: 1

Received By: Juan Rojas

6/29/2021 8:00:00 AM

Juan Rojas

Completed By: Desiree Dominguez

6/29/2021 8:34:29 AM

DD

Reviewed By:

*JR 6/29/21*Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Client

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☒ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4"$ for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: 5
(<2 or >12 unless noted)

Adjusted? YESChecked by: SPA 6.29.21Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks: Added 0.4ml HNO_3 to 003B For pH <2 , metals Analysis.

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.6	Good	Yes			
2	1.5	Good	Yes			

SPA 6.29.21

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

[illegible]

Remarks:

Received by:	Via:	Date	Time
--------------	------	------	------

Relinquished by:

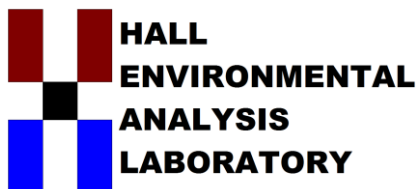
Date:	Time:
-------	-------

Received by:	Via:	Date	Time
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Relinquished by:

Date:	Time:
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If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

October 01, 2021

Mitch Killough
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX:

RE: Nell Hall 1

OrderNo.: 2109C70

Dear Mitch Killough:

Hall Environmental Analysis Laboratory received 6 sample(s) on 9/23/2021 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2109C70

Date Reported: 10/1/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-1

Project: Nell Hall 1

Collection Date: 9/22/2021 12:20:00 PM

Lab ID: 2109C70-001

Matrix: AQUEOUS

Received Date: 9/23/2021 7:09:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.0		µg/L	1	9/27/2021 12:35:55 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 12:35:55 PM
Ethylbenzene	ND	1.0		µg/L	1	9/27/2021 12:35:55 PM
Xylenes, Total	ND	2.0		µg/L	1	9/27/2021 12:35:55 PM
Surr: 4-Bromofluorobenzene	163	70-130	S	%Rec	1	9/27/2021 12:35:55 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	20	1.0	*	mg/L	50	9/29/2021 10:00:47 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order 2109C70

Date Reported: 10/1/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-4

Project: Nell Hall 1

Collection Date: 9/22/2021 9:50:00 AM

Lab ID: 2109C70-002

Matrix: AQUEOUS

Received Date: 9/23/2021 7:09:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.0		µg/L	1	9/27/2021 1:46:36 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 1:46:36 PM
Ethylbenzene	ND	1.0		µg/L	1	9/27/2021 1:46:36 PM
Xylenes, Total	ND	2.0		µg/L	1	9/27/2021 1:46:36 PM
Surr: 4-Bromofluorobenzene	90.6	70-130		%Rec	1	9/27/2021 1:46:36 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	ND	0.020		mg/L	1	9/29/2021 9:17:38 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order 2109C70

Date Reported: 10/1/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-5

Project: Nell Hall 1

Collection Date: 9/22/2021 2:00:00 PM

Lab ID: 2109C70-003

Matrix: AQUEOUS

Received Date: 9/23/2021 7:09:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.0		µg/L	1	9/27/2021 2:10:05 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 2:10:05 PM
Ethylbenzene	ND	1.0		µg/L	1	9/27/2021 2:10:05 PM
Xylenes, Total	ND	2.0		µg/L	1	9/27/2021 2:10:05 PM
Surr: 4-Bromofluorobenzene	92.2	70-130		%Rec	1	9/27/2021 2:10:05 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	ND	0.020		mg/L	1	9/29/2021 9:19:11 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

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Analytical Report

Lab Order 2109C70

Date Reported: 10/1/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-6

Project: Nell Hall 1

Collection Date: 9/22/2021 11:06:00 AM

Lab ID: 2109C70-004

Matrix: AQUEOUS

Received Date: 9/23/2021 7:09:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	3.3	1.0		µg/L	1	9/27/2021 2:33:30 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 2:33:30 PM
Ethylbenzene	5.4	1.0		µg/L	1	9/27/2021 2:33:30 PM
Xylenes, Total	ND	2.0		µg/L	1	9/27/2021 2:33:30 PM
Surr: 4-Bromofluorobenzene	511	70-130	S	%Rec	1	9/27/2021 2:33:30 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	2.5	0.10	*	mg/L	5	9/29/2021 10:02:24 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 4 of 8

Analytical Report

Lab Order 2109C70

Date Reported: 10/1/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-7

Project: Nell Hall 1

Collection Date: 9/22/2021 12:55:00 PM

Lab ID: 2109C70-005

Matrix: AQUEOUS

Received Date: 9/23/2021 7:09:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8021B: VOLATILES						Analyst: NSB
Benzene	ND	1.0		µg/L	1	9/27/2021 2:57:02 PM
Toluene	ND	1.0		µg/L	1	9/27/2021 2:57:02 PM
Ethylbenzene	ND	1.0		µg/L	1	9/27/2021 2:57:02 PM
Xylenes, Total	ND	2.0		µg/L	1	9/27/2021 2:57:02 PM
Surr: 4-Bromofluorobenzene	89.5	70-130		%Rec	1	9/27/2021 2:57:02 PM
EPA METHOD 200.7: DISSOLVED METALS						Analyst: ELS
Iron	ND	0.020		mg/L	1	9/29/2021 9:22:03 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix		

Page 5 of 8

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2109C70

01-Oct-21

Client: HILCORP ENERGY**Project:** Nell Hall 1

Sample ID: LCS	SampType: LCS			TestCode: EPA Method 200.7: Dissolved Metals						
Client ID: LCSW	Batch ID: A81654			RunNo: 81654						
Prep Date:	Analysis Date: 9/29/2021			SeqNo: 2886240		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.50	0.020	0.5000	0	101	85	115			

Sample ID: MB	SampType: MBLK			TestCode: EPA Method 200.7: Dissolved Metals						
Client ID: PBW	Batch ID: A81654			RunNo: 81654						
Prep Date:	Analysis Date: 9/29/2021			SeqNo: 2886258		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID: LLLCS	SampType: LCSLL			TestCode: EPA Method 200.7: Dissolved Metals						
Client ID: BatchQC	Batch ID: A81654			RunNo: 81654						
Prep Date:	Analysis Date: 9/29/2021			SeqNo: 2886260		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.023	0.020	0.02000	0	113	50	150			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2109C70

01-Oct-21

Client: HILCORP ENERGY**Project:** Nell Hall 1

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8021B: Volatiles								
Client ID: PBW	Batch ID: B81596	RunNo: 81596								
Prep Date:	Analysis Date: 9/27/2021	SeqNo: 2883416	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	2.0								
Surr: 4-Bromofluorobenzene	17		20.00		87.5	70	130			

Sample ID: 100ng btex lcs	SampType: LCS	TestCode: EPA Method 8021B: Volatiles								
Client ID: LCSW	Batch ID: B81596	RunNo: 81596								
Prep Date:	Analysis Date: 9/27/2021	SeqNo: 2883417	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.4	80	120			
Toluene	19	1.0	20.00	0	97.0	80	120			
Ethylbenzene	19	1.0	20.00	0	96.6	80	120			
Xylenes, Total	57	2.0	60.00	0	94.7	80	120			
Surr: 4-Bromofluorobenzene	19		20.00		93.2	70	130			

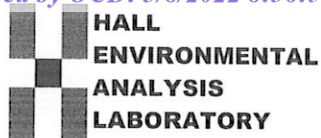
Sample ID: 2109c70-001ams	SampType: MS	TestCode: EPA Method 8021B: Volatiles								
Client ID: MW-1	Batch ID: B81596	RunNo: 81596								
Prep Date:	Analysis Date: 9/27/2021	SeqNo: 2883425	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.3	80	120			
Toluene	19	1.0	20.00	0.2580	95.6	80	120			
Ethylbenzene	19	1.0	20.00	0	96.0	80	120			
Xylenes, Total	57	2.0	60.00	0	95.5	80	120			
Surr: 4-Bromofluorobenzene	32		20.00		162	70	130			S

Sample ID: 2109c70-001amsd	SampType: MSD	TestCode: EPA Method 8021B: Volatiles								
Client ID: MW-1	Batch ID: B81596	RunNo: 81596								
Prep Date:	Analysis Date: 9/27/2021	SeqNo: 2883426	Units: µg/L							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.3	80	120	0.0519	20	
Toluene	19	1.0	20.00	0.2580	94.2	80	120	1.45	20	
Ethylbenzene	19	1.0	20.00	0	94.6	80	120	1.42	20	
Xylenes, Total	57	2.0	60.00	0	94.2	80	120	1.36	20	
Surr: 4-Bromofluorobenzene	33		20.00		163	70	130	0	0	S

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2109C70

RcptNo: 1

Received By: Cheyenne Cason

9/23/2021 7:09:00 AM

Chul

Completed By: Sean Livingston

9/23/2021 9:18:09 AM

*Sean Livingston*Reviewed By: *Chul**9/23/21*Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☒ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4"$ for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved bottles checked for pH: 6
(<2 or >12 unless noted)

Adjusted? YESChecked by: SPA 9.23.21Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

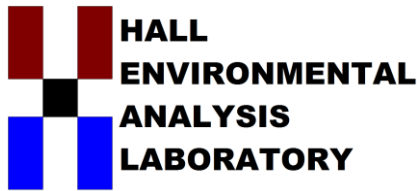
Client Instructions: _____

16. Additional remarks: ADDED 0.4 ml HNO₃ to 004B, 005B for pH⁵², Metals Analysis.

17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.8	Good				

SPA 9.23.21



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

December 06, 2021

Mitch Killough
HILCORP ENERGY
PO Box 4700
Farmington, NM 87499
TEL: (505) 564-0733
FAX:

RE: Nell Hall 1

OrderNo.: 2111761

Dear Mitch Killough:

Hall Environmental Analysis Laboratory received 5 sample(s) on 11/16/2021 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results, it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0901

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Analytical Report

Lab Order 2111761

Date Reported: 12/6/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-4

Project: Nell Hall 1

Collection Date: 11/12/2021 11:45:00 AM

Lab ID: 2111761-001

Matrix: AQUEOUS

Received Date: 11/16/2021 7:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: JLF
Iron	ND	0.020		mg/L	1	11/19/2021 4:02:03 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	1.0		µg/L	1	11/19/2021 8:14:01 AM
Toluene	ND	1.0		µg/L	1	11/19/2021 8:14:01 AM
Ethylbenzene	ND	1.0		µg/L	1	11/19/2021 8:14:01 AM
Xylenes, Total	ND	1.5		µg/L	1	11/19/2021 8:14:01 AM
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	11/19/2021 8:14:01 AM
Surr: 4-Bromofluorobenzene	96.0	70-130		%Rec	1	11/19/2021 8:14:01 AM
Surr: Dibromofluoromethane	104	70-130		%Rec	1	11/19/2021 8:14:01 AM
Surr: Toluene-d8	102	70-130		%Rec	1	11/19/2021 8:14:01 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2111761

Date Reported: 12/6/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-5

Project: Nell Hall 1

Collection Date: 11/15/2021 1:25:00 PM

Lab ID: 2111761-002

Matrix: AQUEOUS

Received Date: 11/16/2021 7:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: JLF
Iron	ND	0.020		mg/L	1	11/19/2021 4:08:53 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	1.0		µg/L	1	11/19/2021 8:40:41 AM
Toluene	ND	1.0		µg/L	1	11/19/2021 8:40:41 AM
Ethylbenzene	ND	1.0		µg/L	1	11/19/2021 8:40:41 AM
Xylenes, Total	ND	1.5		µg/L	1	11/19/2021 8:40:41 AM
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	11/19/2021 8:40:41 AM
Surr: 4-Bromofluorobenzene	97.7	70-130		%Rec	1	11/19/2021 8:40:41 AM
Surr: Dibromofluoromethane	107	70-130		%Rec	1	11/19/2021 8:40:41 AM
Surr: Toluene-d8	105	70-130		%Rec	1	11/19/2021 8:40:41 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2111761

Date Reported: 12/6/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-6

Project: Nell Hall 1

Collection Date: 11/12/2021 1:15:00 PM

Lab ID: 2111761-003

Matrix: AQUEOUS

Received Date: 11/16/2021 7:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: JLF
Iron	0.99	0.020		mg/L	1	11/19/2021 4:11:12 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	140	10		µg/L	10	11/19/2021 4:42:27 PM
Toluene	ND	1.0		µg/L	1	11/19/2021 9:07:27 AM
Ethylbenzene	4.7	1.0		µg/L	1	11/19/2021 9:07:27 AM
Xylenes, Total	ND	1.5		µg/L	1	11/19/2021 9:07:27 AM
Surr: 1,2-Dichloroethane-d4	96.9	70-130		%Rec	1	11/19/2021 9:07:27 AM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	11/19/2021 9:07:27 AM
Surr: Dibromofluoromethane	95.6	70-130		%Rec	1	11/19/2021 9:07:27 AM
Surr: Toluene-d8	105	70-130		%Rec	1	11/19/2021 9:07:27 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Analytical Report

Lab Order 2111761

Date Reported: 12/6/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-7

Project: Nell Hall 1

Collection Date: 11/12/2021 2:45:00 PM

Lab ID: 2111761-004

Matrix: AQUEOUS

Received Date: 11/16/2021 7:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: JLF
Iron	ND	0.020		mg/L	1	11/19/2021 4:13:11 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	1.0		µg/L	1	11/19/2021 9:34:18 AM
Toluene	ND	1.0		µg/L	1	11/19/2021 9:34:18 AM
Ethylbenzene	ND	1.0		µg/L	1	11/19/2021 9:34:18 AM
Xylenes, Total	ND	1.5		µg/L	1	11/19/2021 9:34:18 AM
Surr: 1,2-Dichloroethane-d4	115	70-130		%Rec	1	11/19/2021 9:34:18 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/19/2021 9:34:18 AM
Surr: Dibromofluoromethane	114	70-130		%Rec	1	11/19/2021 9:34:18 AM
Surr: Toluene-d8	104	70-130		%Rec	1	11/19/2021 9:34:18 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

Page 4 of 8

Analytical Report

Lab Order 2111761

Date Reported: 12/6/2021

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW-8

Project: Nell Hall 1

Collection Date: 11/15/2021 9:40:00 AM

Lab ID: 2111761-005

Matrix: AQUEOUS

Received Date: 11/16/2021 7:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 6010B: DISSOLVED METALS						Analyst: JLF
Iron	ND	0.020		mg/L	1	11/19/2021 4:15:33 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: RAA
Benzene	ND	1.0		µg/L	1	11/19/2021 10:01:13 AM
Toluene	ND	1.0		µg/L	1	11/19/2021 10:01:13 AM
Ethylbenzene	ND	1.0		µg/L	1	11/19/2021 10:01:13 AM
Xylenes, Total	ND	1.5		µg/L	1	11/19/2021 10:01:13 AM
Surr: 1,2-Dichloroethane-d4	121	70-130		%Rec	1	11/19/2021 10:01:13 AM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	11/19/2021 10:01:13 AM
Surr: Dibromofluoromethane	113	70-130		%Rec	1	11/19/2021 10:01:13 AM
Surr: Toluene-d8	99.3	70-130		%Rec	1	11/19/2021 10:01:13 AM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	PQL	Practical Quantitative Limit	RL	Reporting Limit
	S	% Recovery outside of range due to dilution or matrix interference		

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2111761

06-Dec-21

Client: HILCORP ENERGY**Project:** Nell Hall 1

Sample ID: 100ng lcs	SampType: LCS		TestCode: EPA Method 8260: Volatiles Short List							
Client ID: LCSW	Batch ID: SL82967		RunNo: 82967							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2945784		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	70	130			
Toluene	20	1.0	20.00	0	99.1	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		106	70	130			
Surr: Dibromofluoromethane	11		10.00		105	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID: mb2	SampType: MBLK		TestCode: EPA Method 8260: Volatiles Short List							
Client ID: PBW	Batch ID: SL82967		RunNo: 82967							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2945790		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		110	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.9	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	11		10.00		106	70	130			

Sample ID: 100ng lcs4	SampType: LCS4		TestCode: EPA Method 8260: Volatiles Short List							
Client ID: BatchQC	Batch ID: SL83025		RunNo: 83025							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2948647		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	115	80	120			
Surr: 1,2-Dichloroethane-d4	11		10.00		109	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		93.9	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID: mb	SampType: MBLK		TestCode: EPA Method 8260: Volatiles Short List							
Client ID: PBW	Batch ID: SL83025		RunNo: 83025							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2948649		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Surr: 1,2-Dichloroethane-d4	12		10.00		115	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.4	70	130			

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix interference

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: 2111761
06-Dec-21

Client: HILCORP ENERGY
Project: Nell Hall 1

Sample ID: mb	SampType: MBLK	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: PBW	Batch ID: SL83025	RunNo: 83025								
Prep Date:	Analysis Date: 11/19/2021	SeqNo: 2948649			Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: Dibromofluoromethane	11		10.00		112	70	130			
Surr: Toluene-d8	11		10.00		105	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
PQL	Practical Quantitative Limit
S	% Recovery outside of range due to dilution or matrix interference

B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Limit

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**

WO#: 2111761

06-Dec-21

Client: HILCORP ENERGY**Project:** Nell Hall 1

Sample ID: MB	SampType: MBLK		TestCode: EPA Method 6010B: Dissolved Metals							
Client ID: PBW	Batch ID: A82995		RunNo: 82995							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2946882		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	ND	0.020								

Sample ID: LCS	SampType: LCS		TestCode: EPA Method 6010B: Dissolved Metals							
Client ID: LCSW	Batch ID: A82995		RunNo: 82995							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2946884		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.47	0.020	0.5000	0	93.0	80	120			

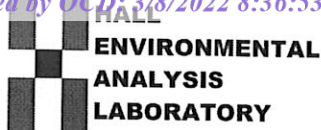
Sample ID: 2111761-001BMS	SampType: MS		TestCode: EPA Method 6010B: Dissolved Metals							
Client ID: MW-4	Batch ID: A82995		RunNo: 82995							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2946886		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.48	0.020	0.5000	0	95.7	75	125			

Sample ID: 2111761-001BMSD	SampType: MSD		TestCode: EPA Method 6010B: Dissolved Metals							
Client ID: MW-4	Batch ID: A82995		RunNo: 82995							
Prep Date:	Analysis Date: 11/19/2021		SeqNo: 2946887		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Iron	0.48	0.020	0.5000	0	96.3	75	125	0.639	20	

Qualifiers:

* Value exceeds Maximum Contaminant Level.
D Sample Diluted Due to Matrix
H Holding times for preparation or analysis exceeded
ND Not Detected at the Reporting Limit
PQL Practical Quantitative Limit
S % Recovery outside of range due to dilution or matrix interference

B Analyte detected in the associated Method Blank
E Value above quantitation range
J Analyte detected below quantitation limits
P Sample pH Not In Range
RL Reporting Limit



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: clients.hallenvironmental.com

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2111761

RcptNo: 1

Received By: Isaiah Ortiz 11/16/2021 7:35:00 AM

Completed By: Tracy Casarrubias 11/16/2021 9:30:45 AM

Reviewed By: *See 11/16/21*Chain of Custody

1. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
4. Were all samples received at a temperature of $>0^{\circ}\text{C}$ to 6.0°C ? Yes ☒ No ☐ NA ☐
5. Sample(s) in proper container(s)? Yes ☒ No ☐
6. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
7. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
8. Was preservative added to bottles? Yes ☒ No ☒ NA ☐
9. Received at least 1 vial with headspace $<1/4$ " for AQ VOA? Yes ☒ No ☐ NA ☐
10. Were any sample containers received broken? Yes ☐ No ☒
11. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes ☒ No ☐
12. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐
13. Is it clear what analyses were requested? Yes ☒ No ☐
14. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes ☒ No ☐

of preserved
bottles checked
for pH: 5

(<2 or >12 unless noted)
Adjusted? yes

Checked by: JR 11/16/21

Special Handling (if applicable)

15. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: _____

Date: _____

By Whom: _____

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

16. Additional remarks: *Filtered off 125ml from unpreserved 100ml plastic bottle. 0.4ml of HNO₃ to samples 001B-005B for pH & 2. For metals analysis*
17. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	0.6	Good	Yes			

Added
Used 6 filters from Lot # FJ 0298.
JR 11/16/21

Chain-of-Custody Record

Client: Hilcorp Farmington NM

Mailing Address: 382 Road 3100 Aztec, NM 87410

Billing Address: PO Box 61529 Houston, TX 77208

Phone #: 505-486-9543

email or Fax#: khoekstra@hilcorp.com

QA/QC Package: mt.khoekstra@hilcorp.com

☐ Standard ☐ Level 4 (Full Validation)Accreditation: ☐ Az Compliance☐ NELAC ☐ Other☐ EDD (Type)

Turn-Around Time:

☒ Standard ☐ Rush

Project Name:

Neil Hall #1

Project #:

Project Manager:

Mitch Killough

Sampler: Kurt Hoekstra

On Ice: ☒ Yes ☐ No

of Coolers:

Cooler Temp (including CP): 0.6 ± 0.5

Date Time Matrix Sample Name

11-12 11:45 Water MW-4

11-15 1:25 Water MW-5

11-12 1:15 Water MW-6

11-12 2:45 Water MW-7

11-15 9:40 Water MW-8

Date: 11-15 1446

Time: 1747

Relinquished by: Kurt Hoekstra

Relinquished by: Christopher Webb

Received by: Mitch Killough

Via: courier

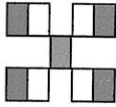
Date: 11/15/21 0735

Date: 11/15/21 1446

Date: 11/15/21 1446

Date: 11/15/21 1446

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL
ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Container Type and #	Preservative Type	HEAL No.	Container Type and #	Preservative Type	HEAL No.
Various	Various	2111761	Various	Various	001
Various	Various		Various	Various	002
Various	Various		Various	Various	003
Various	Various		Various	Various	004
Various	Various		Various	Various	005

Dissolved Fe 500ml HDPE *

BTX 8260 40ml VOA HCl

No SAMPLES FIELD

FILTERED

Remarks: *Dissolved Fe is to be filtered and preserved in the lab.

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 87941

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 87941
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	Review of the 2021 Annual Groundwater Monitoring Report for Nell Hall #1: Content satisfactory 1. Proceed to remove air sparge wells SP-1 through SP-8. May need to check with OSE to see if they have any application requirements for the P&A process. 2. Proceed to P&A wells MW-1 through MW-5. Upload all permits obtained from OSE and ensure all data for MW-1 through MW-5 is uploaded in the incident file for consideration when the closure report is submitted. 3. Submit the 2022 and 2023 Groundwater Annual Reports. 4. Submit the 2024 GW Annual Monitoring Report by April 1, 2025.	5/17/2024