

APPROVED

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By Nelson Velez at 3:37 pm, Jan 03, 2022



March 17, 2021

Mr. Cory Smith
Environmental Specialist
NMOCD
1000 Rio Brazos Drive
Aztec, NM 87410

**Subject: 2020 Annual Groundwater Monitoring Report
OH Randel #007
NMOCD Administrative Order: 3R-386
San Juan County, New Mexico**

Review of 2020 Annual Groundwater Monitoring
Report: Content satisfactory

1. Continued monitoring of groundwater elevations semi-annually in all monitoring wells and collecting groundwater samples semi-annually in monitoring well MW-7 in 2021.
2. Propose a more active remediation options for MW-7 such as chemical additives to increase bioremediation
3. Submit the Annual Monitoring Report to the OCD no later than March 31, 2022

Dear Mr. Smith:

WSP USA Inc. (WSP) presents this annual report on behalf of Hilcorp Energy Company (Hilcorp) to the New Mexico Oil Conservation Division (NMOCD) to document groundwater monitoring activities conducted at the OH Randel #007 natural gas production well (Site) during 2020. The Site is located within Unit Letter D of Section 15 within Township 26 North and Range 11 West, San Juan County, New Mexico (Figure 1) which is considered Navajo Nation lands.

Currently, there are six monitoring wells onsite which are monitored semi-annually for groundwater elevations. One monitoring well is sampled semi-annually. This report presents the results of 2020 monitoring events.

SITE BACKGROUND

In March 2002, former Site operator, XTO, encountered petroleum hydrocarbon-impacted soil, which appeared to be the result of an abandoned earthen separator pit. A Blagg Engineering, Inc. (Blagg) Field Report: *Pit Closure Verification*, documenting subsequent soil sampling and the installation of groundwater monitoring well MW-1 to investigate potential impact to groundwater, is included as Enclosure A. Groundwater was encountered at approximately 16 feet below ground surface (bgs) and phase-separated hydrocarbons (PSH) were detected.

In April 2002, monitoring wells MW-2, MW-3, MW-4, MW-5, and MW-6 were installed upgradient, downgradient, and cross-gradient of the source area. Completion diagrams and borehole logs are included as Enclosure B. From 2002 through 2004, PSH was regularly detected in monitoring wells MW-1 and MW-2, and PSH was detected in monitoring well MW-6 from 2002 through 2006. XTO recovered approximately 22 gallons of PSH by manually bailing monitoring wells MW-1, MW-2, and MW-6 from 2004 through January 2006. XTO submitted a *2005 Annual Groundwater Report* to the NMOCD and proposed excavating impacted soil near the former separator pit and installing additional groundwater monitoring wells to further delineate petroleum hydrocarbon impact to groundwater.

In August 2006, XTO submitted a remediation work plan (Enclosure C) developed by Lodestar Services, Inc. (Lodestar) to Mr. Steve Austin of the Navajo Nation Environmental Protection Agency (NNEPA) and the United States Environmental Protection Agency (EPA) Region 9. The 2002 work plan was approved by the NNEPA in October 2006. In November 2006, the first phase of the 2002 work plan was completed, which included excavating the earthen separator pit to a depth beneath the groundwater table and backfilling with clean soil. Approximately 9,000 cubic yards of petroleum hydrocarbon impacted soil were removed and transported offsite to an NMOCD-permitted landfarm. No PSH was observed on the groundwater table during the excavation. Monitoring wells MW-1, MW-2, and MW-6 were removed during the excavation. The NNEPA and EPA Region 9 approved the closure of the excavation as described in the *Report of Excavation and Sampling at OH Randel #7* by Lodestar dated January 29, 2007 (Enclosure D). Groundwater analytical results indicated samples from monitoring wells MW-3, MW-4, and MW-5 contained concentrations below the laboratory reporting limits for benzene, toluene, ethylbenzene, and total xylenes (BTEX).

XTO submitted a *2006 Annual Groundwater Report* to the NMOCD proposing to install monitoring wells MW-7 and MW-8 to the north and east of the former source area and to conduct quarterly monitoring of BTEX concentrations. In May 2007, monitoring wells MW-7 and MW-8 were installed. Completion diagrams and borehole logs are presented as Enclosure B. Groundwater analytical

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results indicated samples from monitoring well MW-7 contained BTEX concentrations exceeding New Mexico Water Quality Control Commission (NMWQCC) standards. Samples from downgradient monitoring well MW-8 did not contain detectable concentrations of BTEX. XTO proposed to evaluate additional potential sources of groundwater impact around monitoring well MW-7 and appropriate remediation methods.

XTO submitted the *2007 Annual Groundwater Report* to the NMOCD proposing to discontinue sampling of monitoring wells MW-3, MW-4, and MW-5, and to conduct semi-annual sampling of monitoring wells MW-7 and MW-8. XTO submitted the *2008 Annual Groundwater Report* to the NMOCD proposing to install monitoring wells MW-9 and MW-10 to delineate impacted groundwater near existing monitoring well MW-7. Additionally, XTO proposed adding chemical oxygenate to monitoring well MW-7 to enhance bioremediation and conducting quarterly sampling of monitoring wells.

In July 2009, monitoring wells MW-9 and MW-10 were installed. The water-bearing unit supplying the existing groundwater monitoring wells was observed to be a clay with low hydraulic conductivity that was mostly dry. Monitoring wells MW-9 and MW-10 were completed in the same clay bed at similar depths to the existing monitoring wells despite the fact that no saturated sediment was identified in soil borings. Well installation did not penetrate the clay to avoid creating a conduit to deeper aquifers. After allowing 24 hours for the new monitoring wells to fill with groundwater, monitoring well MW-9 contained only 1.5 feet of groundwater and did not recharge after being purged dry. Monitoring well MW-10 never filled with groundwater and was ultimately plugged and abandoned. The completion diagrams and borehole logs for monitoring wells MW-9 and MW-10 are included in Enclosure B. Monitoring well MW-9 was sampled after well development and samples contained benzene concentrations exceeding NMWQCC standards.

In March 2010, XTO submitted the *2009 Annual Groundwater Report* to the NMOCD recommending continued use of chemical oxygenate in monitoring well MW-7 and conducting quarterly sampling of monitoring wells MW-7 and MW-9. XTO proposed to discontinue sampling of monitoring well MW-8 as analytical results for four consecutive sampling events indicated BTEX concentrations were in compliance with the NMWQCC standards.

XTO submitted the *2010 Annual Groundwater Report* to the NMOCD and NNEPA recommending continued quarterly sampling of groundwater for BTEX constituents in monitoring well MW-7. Laboratory analytical results from four consecutive quarters of groundwater sampling from monitoring well MW-9 indicated BTEX concentrations were compliant with NMWQCC standards; therefore, XTO recommended discontinuing sampling of monitoring well MW-9.

In October 2011, XTO met with the NMOCD to present a brief history of the Site and propose the application of hydrogen peroxide to groundwater via monitoring well MW-7 as an injection point to oxygenate the aquifer and enhance bioremediation. The NMOCD did not provide comments for the proposed work plan and XTO did not proceed with the action.

XTO submitted the *2011 Annual Groundwater Report* to the NMOCD and NNEPA. The report included an analysis of the beneficial use of groundwater at the Site. The analysis concluded the groundwater is not a current source of beneficial use and based on the poor background water quality of the aquifer, low productivity, and legal restrictions on its source for uses other than irrigation, the aquifer is not viable for beneficial use in the future. Attenuation of residual BTEX in groundwater at the Site will continue through natural processes, and migration of any BTEX will be restricted by the subsurface lithology and hydrologic properties of the aquifer. As such, XTO requested Site closure from the NMOCD and NNEPA based on the lack of present and reasonably foreseeable beneficial use of the impacted groundwater. Following NMOCD and NNEPA approval for closure, XTO planned to abandon all monitoring well locations in accordance with the monitoring well abandonment plan. XTO was awaiting approval or comments from the NMOCD and NNEPA regarding the closure request and did not conduct monitoring at the Site during 2012.

In March 2013, following the NMOCD and NNEPA verbal request that XTO pursue additional remediation before requesting Site closure, XTO resumed applying chemical oxygenate by installing ten Oxygen Release Compound® (ORC) socks in monitoring well MW-7. The ORC socks were removed from monitoring well MW-7 in December 2013 to assess equilibrium conditions.

XTO submitted the *2014, 2015, 2016, and 2017 Annual Groundwater Reports* to the NMOCD recommending continued semi-annual gauging of depth to groundwater and sampling of groundwater for BTEX in monitoring well MW-7. Additionally, XTO investigated the application of a chemical amendment to enhance natural attenuation, however, based on the historical sampling results and the groundwater flow direction, XTO opted not to pursue further active remediation as the elevated benzene concentrations appeared to be confined to a small area surrounding monitoring well MW-7 and are not likely to migrate offsite.

In August of 2017, Hilcorp acquired the Site from XTO and continued semi-annual monitoring of groundwater through 2019. Hilcorp submitted the *2018 and 2019 Annual Groundwater Reports* to the NMOCD recommending continued semi-annual gauging of all wells



and sampling groundwater for BTEX analysis in monitoring well MW-7. A summary of groundwater elevations and laboratory analytical results from historical and current groundwater monitoring are presented in Table 1 and Table 2, respectively.

GROUNDWATER SAMPLING ACTIVITIES AND RESULTS

In 2020, depth to groundwater was measured in monitoring wells MW-3, MW-4, MW-5, MW-7, MW-8, and MW-9. Semi-annual groundwater samples were collected from groundwater monitoring well MW-7 and submitted to Hall Environmental Analytical Laboratory (HEAL) in Albuquerque, New Mexico, for laboratory analysis of BTEX by EPA Method 8021B.

GROUNDWATER-LEVEL MEASUREMENTS

Prior to collection of groundwater samples depth to groundwater in each well was measured using a keck oil/water interface probe. Groundwater elevations are detailed in Table 1. Presence of any free-phase petroleum hydrocarbons was investigated using the interface probe. The interface probe was decontaminated with Alconox™ soap and rinsed with de-ionized water prior to each measurement to prevent cross-contamination.

GROUNDWATER SAMPLING

The volume of groundwater in monitoring well MW-7 was calculated, and a minimum of three well casing volumes of groundwater was purged (unless the well purged dry) using a new disposable polyvinyl chloride (PVC) bailer or a dedicated PVC bailer. All purge groundwater was disposed of into Hilcorp tanks. Once the monitoring well was purged, groundwater samples were collected by filling a minimum of two 40-milliliter (mL) glass vials. The laboratory-supplied vials were filled and capped with zero headspace to prevent degradation of the samples. Samples were labeled with the date and time of collection, well designation, project name, sample collector's name, and parameters to be analyzed. The samples were immediately sealed, packed on ice, and hand delivered to HEAL. 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. Laboratory analytical reports for 2020 are included as Enclosure E and the 2020 groundwater sample collection forms semi-annual monitoring events are included as Enclosure F.

GROUNDWATER CONTOUR MAPS

Groundwater elevations measured in monitoring wells during June and December 2020 visits were used to draft groundwater potentiometric surface maps (Figures 2 and 3). Contours were inferred based on groundwater elevations and observation of physical characteristics (topography, proximity to irrigation ditches, etc.) at the Site.

GROUNDWATER ANALYTICAL RESULTS

Groundwater elevations measured during 2020 Site monitoring activities indicate the groundwater continues to flow to the north, which is consistent with historical monitoring events. Figures 2 and 3 depict the inferred groundwater potentiometric surface and groundwater analytical results for the June and the December 2020 semi-annual monitoring events. Groundwater elevation data are summarized in Table 1.

During 2020, laboratory analytical results indicated benzene and total xylenes concentrations in samples from monitoring well MW-7 exceeded the NMWQCC standards during both semi-annual sampling events. Benzene concentrations ranged from 830 micrograms per liter (µg/L) in June to 9,400 µg/L in December. Total xylenes concentrations ranged from 640 µg/L in June to 6,600 µg/L in December. The toluene and ethylbenzene concentrations were in compliance with the NMWQCC standards for both 2020 semi-annual sampling events. Laboratory analytical results are summarized in Table 2.

CONCLUSIONS AND RECOMMENDATIONS

Laboratory analytical results from groundwater monitoring in 2020 indicate benzene and total xylenes concentrations in monitoring well MW-7 exceeded NMWQCC standards during both semi-annual sampling events. Toluene and ethylbenzene concentrations were in compliance with the NMWQCC standards in monitoring well MW-7 during both 2020 semi-annual sampling events. Based on historical sampling results and the groundwater flow direction, elevated benzene and total xylenes concentrations appear confined to a limited area surrounding monitoring well MW-7 and are not likely to migrate offsite.

WSP proposes continued monitoring of groundwater elevations semi-annually in all monitoring wells and collecting groundwater samples semi-annually in monitoring well MW-7 in 2021. WSP and Hilcorp will investigate more active remediation options for MW-7 such as chemical additives to increase bioremediation.



Kind regards,

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

Josh Adams, P.G.
Associate Consultant, Geologist

A handwritten signature in black ink, appearing to read 'Ashley L. Ager'.

Ashley Ager, M.S., P.G.
Managing Director

Enclosed:

Figure 1: Site Location Map

Figure 2: Groundwater Elevation and Analytical Results- June 2020

Figure 3: Groundwater Elevation and Analytical Results- December 2020

Table 1: Groundwater Elevation Summary

Table 2: Groundwater Analytical Results

Enclosure A: Blagg Field Report: Pit Closure Verification (2002)

Enclosure B: Completion Diagrams and Borehole Logs

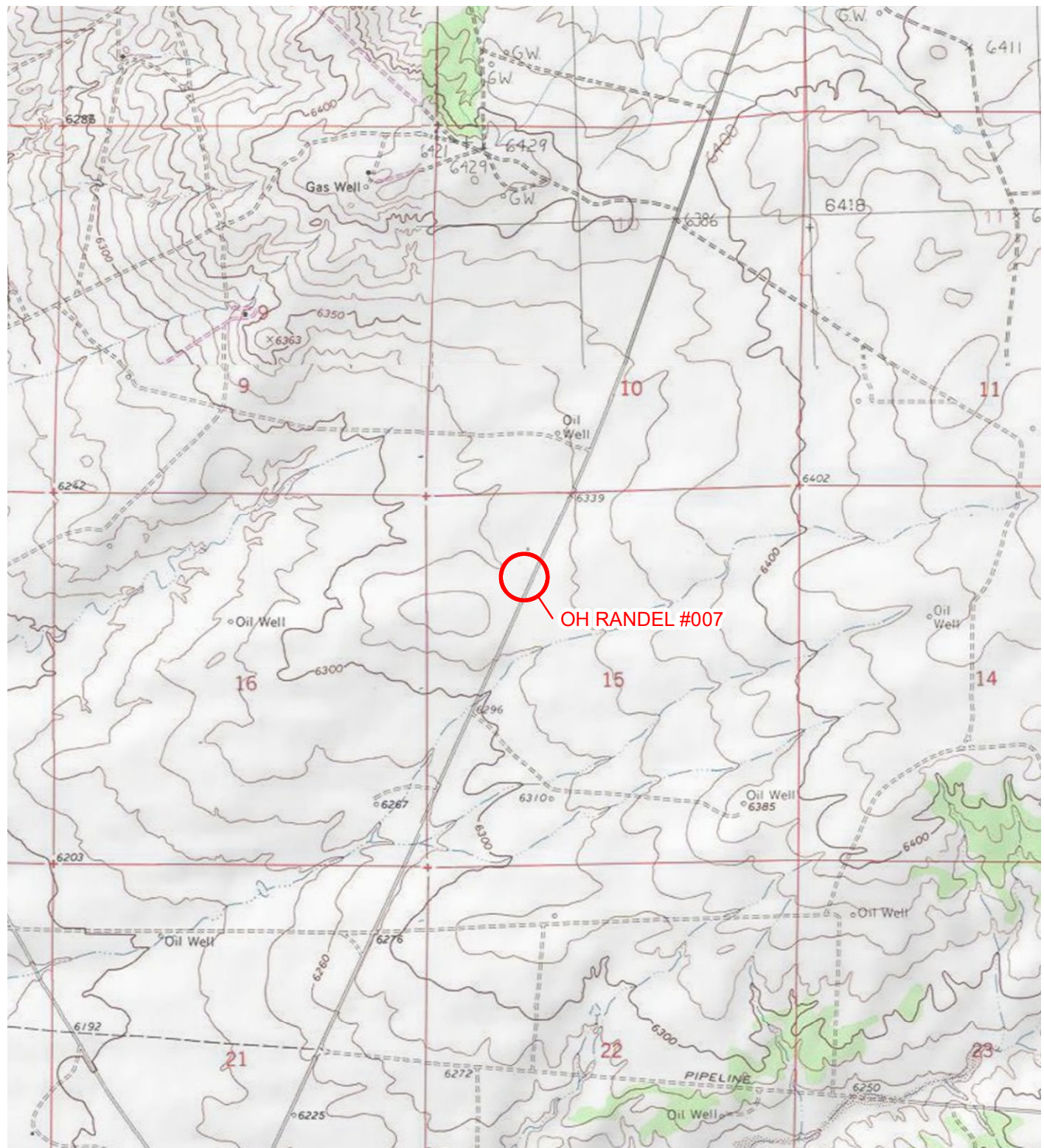
Enclosure C: Lodestar Remediation Work Plan (2006)

Enclosure D: Lodestar Report of Excavation and Sampling at OH Randel #7 (2007)

Enclosure E: 2020 Laboratory Analytical Reports

Enclosure F: 2020 Groundwater Sample Collection Forms

FIGURES

**LEGEND**

○ SITE LOCATION

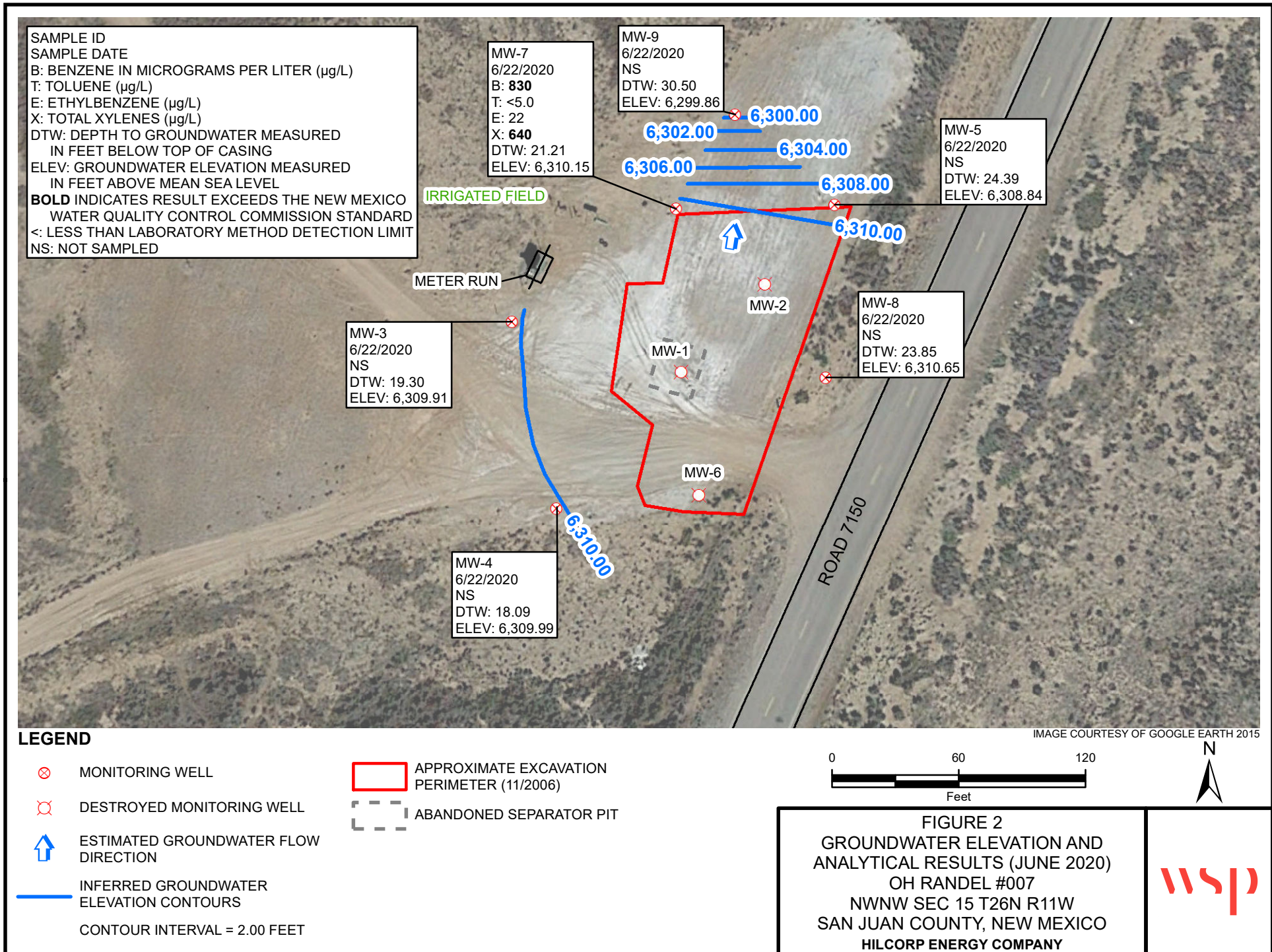
IMAGE COURTESY OF ESRI/USGS

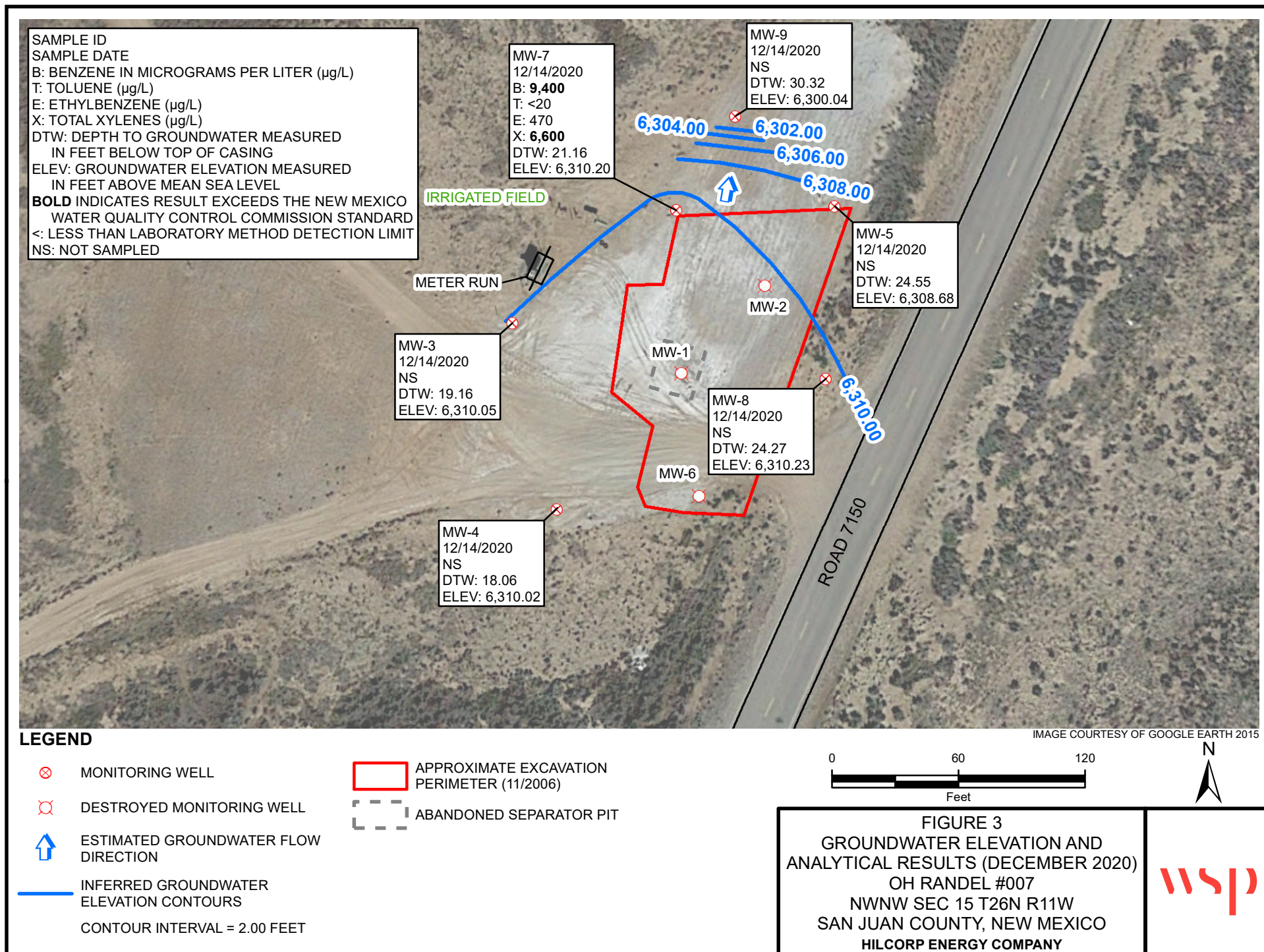
0 2,000 4,000
Feet



FIGURE 1
SITE LOCATION MAP
OH RANDEL #007
 NWNW SEC 15 T26N R11W
 SAN JUAN COUNTY, NEW MEXICO
 HILCORP ENERGY COMPANY







TABLES

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-1	4/22/2002	16.30	16.63	No Survey Data
MW-1	4/24/2002	NM	NM	No Survey Data
MW-1	8/27/2002	16.19	16.49	No Survey Data
MW-1	10/08/2002	15.79	16.16	No Survey Data
MW-1	5/23/2003	15.73	16.04	No Survey Data
MW-1	5/28/2003	15.81	15.99	No Survey Data
MW-1	6/6/2003	15.93	16.04	No Survey Data
MW-1	6/18/2003	15.97	16.04	No Survey Data
MW-1	6/26/2003	17.85	17.93	No Survey Data
MW-1	7/31/2003	16.18	16.19	No Survey Data
MW-1	8/29/2003	NM	16.29	No Survey Data
MW-1	6/21/2004	16.28	17.09	No Survey Data
MW-1	9/20/2006	0.00	22.28	No Survey Data
MW-1	12/5/2006 *	NM	NM	No Survey Data
MW-2	4/22/2002	NM	18.32	No Survey Data
MW-2	4/24/2002	18.35	18.38	No Survey Data
MW-2	8/27/2002	18.92	19.86	No Survey Data
MW-2	10/08/2002	17.50	18.02	No Survey Data
MW-2	5/23/2003	17.30	17.83	No Survey Data
MW-2	5/28/2003	17.62	17.78	No Survey Data
MW-2	6/6/2003	17.71	17.83	No Survey Data
MW-2	6/18/2003	17.79	17.88	No Survey Data
MW-2	6/26/2003	16.05	16.09	No Survey Data
MW-2	7/31/2003	NM	15.86	No Survey Data
MW-2	8/29/2003	NM	15.99	No Survey Data
MW-2	6/21/2004	16.10	16.83	No Survey Data
MW-2	9/20/2006	0.00	17.15	No Survey Data
MW-2	12/5/2006 *	NM	NM	No Survey Data

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-3	4/22/2002	ND	16.26	6,312.95
MW-3	4/24/2002	ND	16.25	6,312.96
MW-3	8/27/2002	ND	15.28	6,313.93
MW-3	10/8/2002	ND	14.74	6,314.47
MW-3	3/3/2003	ND	15.17	6,314.04
MW-3	6/18/2003	ND	15.16	6,314.05
MW-3	8/29/2003	ND	15.39	6,313.82
MW-3	9/20/2006	NM	NM	NM
MW-3	12/5/2006	ND	13.85	6,315.36
MW-3	3/8/2007	ND	13.40	6,315.81
MW-3	5/17/2007	ND	12.87	6,316.34
MW-3	8/9/2007	ND	12.37	6,316.84
MW-3	5/12/2008	ND	14.83	6,314.38
MW-3	11/7/2008	ND	13.92	6,315.29
MW-3	7/8/2009	ND	14.14	6,315.07
MW-3	11/5/2009	ND	14.53	6,314.68
MW-3	5/25/2010	ND	14.21	6,315.00
MW-3	8/12/2010	ND	NM	NM
MW-3	11/17/2010	ND	15.30	6,313.91
MW-3	2/14/2011	ND	NM	NM
MW-3	5/17/2011	ND	15.74	6,313.47
MW-3	8/9/2011	ND	15.87	6,313.34
MW-3	11/9/2011	ND	16.21	6,313.00
MW-3	6/17/2013	ND	17.32	6,311.89
MW-3	12/16/2013	ND	16.88	6,312.33
MW-3	6/11/2014	ND	18.60	6,310.61
MW-3	12/9/2014	ND	17.37	6,311.84
MW-3	6/11/2015	ND	18.45	6,310.76
MW-3	12/21/2015	ND	17.55	6,311.66
MW-3	6/20/2016	ND	18.86	6,310.35

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-3	12/14/2016	ND	17.86	6,311.35
MW-3	6/26/2017	ND	18.11	6,311.10
MW-3	12/12/2017	ND	18.28	6,310.93
MW-3	6/28/2018	ND	18.65	6,310.56
MW-3	12/10/2018	ND	18.77	6,310.44
MW-3	6/19/2019	ND	19.25	6,309.96
MW-3	12/9/2019	ND	18.90	6,310.31
MW-3	6/22/2020	ND	19.30	6,309.91
MW-3	12/14/2020	ND	19.16	6,310.05
MW-4	4/22/2002	ND	16.63	6,311.45
MW-4	4/24/2002	ND	16.66	6,311.42
MW-4	8/27/2002	ND	16.47	6,311.61
MW-4	10/8/2002	ND	16.03	6,312.05
MW-4	3/3/2003	ND	15.94	6,312.14
MW-4	6/18/2003	ND	16.03	6,312.05
MW-4	8/29/2003	ND	16.29	6,311.79
MW-4	9/20/2006	NM	NM	NM
MW-4	12/5/2006	ND	13.75	6,314.33
MW-4	3/8/2007	ND	12.55	6,315.53
MW-4	5/17/2007	ND	13.03	6,315.05
MW-4	8/9/2007	ND	12.59	6,315.49
MW-4	5/12/2008	ND	12.57	6,315.51
MW-4	11/7/2008	ND	13.68	6,314.40
MW-4	7/8/2009	ND	13.72	6,314.36
MW-4	11/5/2009	ND	14.12	6,313.96
MW-4	5/25/2010	ND	13.86	6,314.22
MW-4	8/12/2010	ND	14.39	6,313.69
MW-4	11/17/2010	ND	14.60	6,313.48
MW-4	2/14/2011	ND	15.55	6,312.53

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-4	5/17/2011	ND	14.95	6,313.13
MW-4	8/9/2011	ND	15.11	6,312.97
MW-4	11/9/2011	ND	15.38	6,312.70
MW-4	6/17/2013	ND	16.33	6,311.75
MW-4	12/16/2013	ND	15.99	6,312.09
MW-4	6/11/2014	ND	16.30	6,311.78
MW-4	12/9/2014	ND	16.48	6,311.60
MW-4	6/11/2015	ND	16.14	6,311.94
MW-4	12/21/2015	ND	16.75	6,311.33
MW-4	6/20/2016	ND	16.98	6,311.10
MW-4	12/14/2016	ND	16.95	6,311.13
MW-4	6/26/2017	ND	17.09	6,310.99
MW-4	12/12/2017	ND	17.27	6,310.81
MW-4	6/28/2018	ND	17.53	6,310.55
MW-4	12/10/2018	ND	17.66	6,310.42
MW-4	6/19/2019	ND	17.89	6,310.19
MW-4	12/9/2019	ND	17.83	6,310.25
MW-4	6/22/2020	ND	18.09	6,309.99
MW-4	12/14/2020	ND	18.06	6,310.02
MW-5	4/22/2002	ND	19.11	6,314.12
MW-5	4/24/2002	ND	19.14	6,314.09
MW-5	8/10/2002	ND	19.10	6,314.13
MW-5	6/18/2003	ND	18.86	6,314.37
MW-5	6/21/2004	ND	19.64	6,313.59
MW-5	6/28/2005	ND	17.30	6,315.93
MW-5	9/20/2006	NM	NM	NM
MW-5	12/5/2006	ND	18.65	6,314.58
MW-5	3/8/2007	ND	18.15	6,315.08
MW-5	5/17/2007	ND	17.78	6,315.45

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-5	8/9/2007	ND	NM	NM
MW-5	5/12/2008	ND	18.82	6,314.41
MW-5	11/7/2008	ND	18.90	6,314.33
MW-5	7/8/2009	ND	20.08	6,313.15
MW-5	11/5/2009	ND	20.44	6,312.79
MW-5	5/25/2010	ND	20.33	6,312.90
MW-5	8/12/2010	ND	20.51	6,312.72
MW-5	11/17/2010	ND	20.93	6,312.30
MW-5	2/14/2011	ND	20.97	6,312.26
MW-5	5/17/2011	ND	21.20	6,312.03
MW-5	8/9/2011	ND	21.47	6,311.76
MW-5	11/9/2011	ND	21.69	6,311.54
MW-5	6/17/2013	ND	22.74	6,310.49
MW-5	12/16/2013	ND	22.36	6,310.87
MW-5	6/11/2014	ND	22.77	6,310.46
MW-5	12/9/2014	ND	22.21	6,311.02
MW-5	6/11/2015	ND	22.69	6,310.54
MW-5	12/21/2015	ND	22.55	6,310.68
MW-5	6/20/2016	ND	23.08	6,310.15
MW-5	12/14/2016	ND	23.19	6,310.04
MW-5	6/26/2017	ND	23.28	6,309.95
MW-5	12/12/2017	ND	23.45	6,309.78
MW-5	6/28/2018	ND	24.76	6,308.47
MW-5	12/10/2018	ND	23.99	6,309.24
MW-5	6/19/2019	ND	24.18	6,309.05
MW-5	12/9/2019	ND	24.24	6,308.99
MW-5	3/13/2020	ND	24.30	6,308.93
MW-5	6/22/2020	ND	24.39	6,308.84
MW-5	12/14/2020	ND	24.55	6,308.68

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-6	4/22/2002	0.00	18.31	No Survey Data
MW-6	4/24/2002	0.00	18.32	No Survey Data
MW-6	8/27/2002	NM	NM	No Survey Data
MW-6	10/8/2002	16.84	18.13	No Survey Data
MW-6	5/23/2003	16.62	17.95	No Survey Data
MW-6	5/28/2003	16.68	17.90	No Survey Data
MW-6	6/6/2003	16.80	18.00	No Survey Data
MW-6	6/18/2003	16.78	18.02	No Survey Data
MW-6	6/26/2003	16.88	18.10	No Survey Data
MW-6	7/31/2003	17.77	19.13	No Survey Data
MW-6	8/29/2003	16.88	18.34	No Survey Data
MW-6	6/21/2004	17.78	18.95	No Survey Data
MW-6	9/20/2006	15.79	16.87	No Survey Data
MW-6	12/5/2006 *	NM	NM	No Survey Data
MW-7	5/17/2007	ND	15.46	6,315.90
MW-7	8/9/2007	ND	14.72	6,316.64
MW-7	11/27/2007	ND	14.91	6,316.45
MW-7	5/12/2008	ND	15.12	6,316.24
MW-7	11/7/2008	ND	15.82	6,315.54
MW-7	7/8/2009	ND	16.44	6,314.92
MW-7	11/5/2009	ND	16.76	6,314.60
MW-7	5/25/2010	ND	16.63	6,314.73
MW-7	8/12/2010	ND	16.82	6,314.54
MW-7	11/17/2010	ND	17.65	6,313.71
MW-7	2/14/2011	ND	17.74	6,313.62
MW-7	5/17/2011	ND	17.92	6,313.44
MW-7	8/9/2011	ND	18.11	6,313.25
MW-7	11/9/2011	ND	18.46	6,312.90
MW-7	6/17/2013	ND	19.45	6,311.91

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-7	12/16/2013	ND	19.39	6,311.97
MW-7	6/11/2014	ND	19.56	6,311.80
MW-7	12/9/2014	ND	19.67	6,311.69
MW-7	6/11/2015	ND	19.40	6,311.96
MW-7	12/21/2015	ND	19.50	6,311.86
MW-7	6/20/2016	ND	19.91	6,311.45
MW-7	12/14/2016	ND	20.04	6,311.32
MW-7	6/26/2017	ND	20.33	6,311.03
MW-7	12/12/2017	ND	20.44	6,310.92
MW-7	6/28/2018	ND	20.91	6,310.45
MW-7	12/10/2018	ND	20.94	6,310.42
MW-7	6/19/2019	ND	21.15	6,310.21
MW-7	12/9/2019	ND	20.95	6,310.41
MW-7	6/22/2020	ND	21.21	6,310.15
MW-7	12/14/2020	ND	21.16	6,310.20
MW-8	5/17/2007	ND	19.64	6,314.86
MW-8	8/9/2007	ND	18.94	6,315.56
MW-8	11/27/2007	ND	19.20	6,315.30
MW-8	5/12/2008	ND	19.97	6,314.53
MW-8	11/7/2008	ND	19.55	6,314.95
MW-8	7/8/2009	ND	20.01	6,314.49
MW-8	11/5/2009	ND	20.41	6,314.09
MW-8	5/25/2010	ND	20.31	6,314.19
MW-8	8/12/2010	ND	20.41	6,314.09
MW-8	11/17/2010	ND	20.63	6,313.87
MW-8	2/14/2011	ND	20.35	6,314.15
MW-8	5/17/2011	ND	20.30	6,314.20
MW-8	8/9/2011	ND	20.83	6,313.67
MW-8	11/9/2011	ND	21.00	6,313.50

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-8	6/17/2013	ND	22.17	6,312.33
MW-8	12/16/2013	ND	21.40	6,313.10
MW-8	6/11/2014	ND	22.09	6,312.41
MW-8	12/9/2014	ND	22.80	6,311.70
MW-8	6/11/2015	ND	21.76	6,312.74
MW-8	12/21/2015	ND	22.83	6,311.67
MW-8	6/20/2016	ND	22.40	6,312.10
MW-8	12/14/2016	ND	23.54	6,310.96
MW-8	6/26/2017	ND	22.28	6,312.22
MW-8	12/12/2017	ND	22.70	6,311.80
MW-8	6/28/2018	ND	23.02	6,311.48
MW-8	12/10/2018	ND	23.21	6,311.29
MW-8	6/19/2019	ND	23.28	6,311.22
MW-8	12/9/2019	ND	23.50	6,311.00
MW-8	6/22/2020	ND	23.85	6,310.65
MW-8	12/14/2020	ND	24.27	6,310.23
MW-9	7/8/2009	ND	35.26	6,295.10
MW-9	11/5/2009	ND	33.08	6,297.28
MW-9	5/25/2010	ND	29.28	6,301.08
MW-9	8/12/2010	ND	31.12	6,299.24
MW-9	5/25/2010	ND	20.31	6,310.05
MW-9	8/12/2010	ND	20.41	6,309.95
MW-9	11/17/2010	ND	30.49	6,299.87
MW-9	2/14/2011	ND	31.60	6,298.76
MW-9	5/17/2011	ND	30.39	6,299.97
MW-9	8/9/2011	ND	29.84	6,300.52
MW-9	11/9/2011	ND	28.76	6,301.60
MW-9	6/17/2013	ND	28.36	6,302.00
MW-9	12/16/2013	ND	27.97	6,302.39

Table 1

Groundwater Elevation Summary
OH Randel #007
San Juan County, New Mexico

Well ID	Date	Depth to Product (feet BTOC)	Depth to Water (feet BTOC)	Groundwater Elevation (feet AMSL)
MW-9	6/11/2014	ND	28.68	6,301.68
MW-9	12/9/2014	ND	28.45	6,301.91
MW-9	6/11/2015	ND	28.98	6,301.38
MW-9	12/21/2015	ND	28.22	6,302.14
MW-9	6/20/2016	ND	28.66	6,301.70
MW-9	12/14/2016	ND	28.42	6,301.94
MW-9	6/26/2017	ND	29.05	6,301.31
MW-9	12/12/2017	ND	29.00	6,301.36
MW-9	6/28/2018	ND	29.48	6,300.88
MW-9	12/10/2018	ND	29.48	6,300.88
MW-9	6/19/2019	ND	30.09	6,300.27
MW-9	12/9/2019	ND	30.20	6,300.16
MW-9	6/22/2020	ND	30.50	6,299.86
MW-9	12/14/2020	ND	30.32	6,300.04

AMSL - above mean sea level

BTOC - below top of casing

ND - none detected

NM - not measured

* - well was destroyed

Table 2

**Groundwater Analytical Results
OH Randel #007
San Juan County, New Mexico**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Groundwater Standard		5	1,000	700	620
MW-3	4/24/2002	24	2.4	0.58	200
MW-3	8/27/2002	9.4	ND	ND	150
MW-3	3/3/2003	5.5	ND	ND	43
MW-3	6/18/2003	6.1	0.97	ND	43
MW-3	8/29/2003	3.2	0.53	ND	24
MW-3	12/5/2006	<1	<1	<1	<3
MW-3	5/17/2007	<1	<1	<1	<2
MW-3	8/9/2007	<1	<1	<1	<2
MW-4	4/24/2002	ND	0.59	ND	2.1
MW-4	8/27/2002	1.3	ND	ND	3.5
MW-4	3/3/2003	4.2	ND	ND	5
MW-4	6/18/2003	6.2	ND	ND	4.5
MW-4	8/29/2003	8.3	ND	ND	4.3
MW-4	12/5/2006	<1	<1	<1	<3
MW-4	5/17/2007	<1	<1	<1	<2
MW-4	8/9/2007	<1	<1	<1	<2
MW-5	4/24/2002	510	0.64	8.9	240
MW-5	6/18/2003	1,100	20	ND	660
MW-5	6/21/2004	2,000	ND	ND	260
MW-5	6/28/2005	1,100	15	ND	160
MW-5	12/5/2006	37	<1	<1	4.1
MW-5	5/17/2007	<1	<1	<1	<2
MW-6	4/24/2002	6,100	4,800	920	6,600
MW-7	5/17/2007	8,500	17,000	980	16,000
MW-7	8/9/2007	9,800	11,000	770	12,000
MW-7	11/27/2007	12,000	9,000	940	13,000
MW-7	5/12/2008	7,900	11,000	830	12,000

Table 2

**Groundwater Analytical Results
OH Randel #007
San Juan County, New Mexico**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Groundwater Standard		5	1,000	700	620
MW-7	11/7/2008	12,000	16,000	1,100	17,000
MW-7	7/8/2009	9,800	8,200	<100	12,000
MW-7	11/5/2009	9,800	7,900	570	13,000
MW-7	5/25/2010	7,200	3,800	440	11,000
MW-7	8/12/2010	82	58	9.2	200
MW-7	11/17/2010	5,200	5,500	76	3,400
MW-7	2/14/2011	2,200	1,000	<120	1,800
MW-7	5/17/2011	500	190	16	180
MW-7	8/9/2011	81.3	36.9	5.3	39.4
MW-7	11/9/2011	26	16	2.3	20
MW-7	6/17/2013	0.72	<5.0	<0.50	<1.5
MW-7	12/16/2013	130	<50	7.6	62
MW-7	6/11/2014	7,600	6,400	100	5,900
MW-7	12/9/2014	9,400	2,600	250	6,100
MW-7	6/11/2015	8,300	960	410	7,200
MW-7	12/21/2015	9,040	67.6	465	7,310
MW-7	6/20/2016	9,160	412	615	8,750
MW-7	12/14/2016	8,400	368	284	6,950
MW-7	6/26/2017	6,580	<10.0	126	3,950
MW-7	12/12/2017	9,050	<50.0	406	7,020
MW-7	6/28/2018	8,300	6.2	220	6,100
MW-7	12/10/2018	8,400	<10.0	320	6,200
MW-7	6/19/2019	14,000	<50	540	12,000
MW-7	12/9/2019	6,800	<50	330	5,700
MW-7	6/22/2020	830	<5.0	22	640
MW-7	12/14/2020	9,400	<20	470	6,600
MW-8	5/17/2007	<1.0	1.9	<1.0	3.7
MW-8	8/9/2007	<1.0	<1.0	<1.0	<2.0
MW-8	11/27/2007	21.0	<1.0	<1.0	<2.0
MW-8	5/12/2008	1.4	<1.0	<1.0	<2.0

Table 2

**Groundwater Analytical Results
OH Randel #007
San Juan County, New Mexico**

Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
NMWQCC Groundwater Standard		5	1,000	700	620
MW-8	11/7/2008	1.2	<1.0	<1.0	<2.0
MW-8	7/8/2009	<1.0	<1.0	<1.0	<2.0
MW-8	11/5/2009	1.1	<1.0	<1.0	<2.0
MW-9	7/8/2009	91	160	6.9	100
MW-9	11/30/2009	<1	<1	<1	<2
MW-9	5/25/2010	<1.0	<1.0	<1.0	<2.0
MW-9	8/12/2010	<0.5	<5.0	<0.5	<1.5
MW-9	11/17/2010	2.4	<5.0	<0.5	<1.5

µg/L - micrograms per liter

ND - not detected

NMWQCC - New Mexico Water Quality Control Commission

BOLD indicates the result exceeds the NMWQCC Standard

< indicates result is less than the stated laboratory method detection limit

ENCLOSURE A – BLAGG FIELD REPORT: PIT CLOSURE VERIFICATION (2002)

CLIENT: <u>XTO</u>	BLAGG ENGINEERING, INC. P.O. BOX 87, BLOOMFIELD, NM 87413 (505) 632-1199	LOCATION NO: _____ C.O.C. NO: <u>9796</u>																																																		
FIELD REPORT: PIT CLOSURE VERIFICATION		PAGE No: <u>1</u> of <u>1</u>																																																		
LOCATION: NAME: <u>O.H. RANDEL</u> WELL #: <u>7</u> TYPE: <u>ABAN. SEP.</u>		DATE STARTED: <u>3/12/02</u>																																																		
QUAD/UNIT: <u>D</u> SEC: <u>15</u> TWP: <u>26N</u> RNG: <u>11W</u> PM: <u>NM</u> CNTY: <u>SJ</u> ST: <u>NM</u>		DATE FINISHED: _____																																																		
QTR/FOOTAGE: <u>1150'N/1150'W</u> NW/NEW CONTRACTOR: _____		ENVIRONMENTAL SPECIALIST: <u>NV</u>																																																		
EXCAVATION APPROX. <u>NA</u> FT. x <u>NA</u> FT. x <u>NA</u> FT. DEEP. CUBIC YARDAGE: <u>NA</u>																																																				
DISPOSAL FACILITY: <u>ON-SITE</u> REMEDIATION METHOD: _____																																																				
LAND USE: <u>RANGE - BLM</u> LEASE: _____ FORMATION: <u>DK</u>																																																				
FIELD NOTES & REMARKS: PIT LOCATED APPROXIMATELY <u>239</u> FT. <u>SE</u> FROM WELLHEAD.																																																				
DEPTH TO GROUNDWATER: <u>>100'</u> NEAREST WATER SOURCE: <u>>1000'</u> NEAREST SURFACE WATER: <u>>1000'</u>																																																				
NMOC RANKING SCORE: <u>0</u> NMOC TPH CLOSURE STD: <u>5000</u> PPM																																																				
SOIL AND EXCAVATION DESCRIPTION:		OVM CALIB. READ: <u>52.7</u> ppm OVM CALIB. GAS = <u>100</u> ppm RF = <u>0.52</u> TIME: <u>11:48</u> am/pm DATE: <u>3/12/02</u>																																																		
SOIL TYPE: <u>SAND</u> / SILTY SAND / SILT / SILTY CLAY / CLAY / GRAVEL / OTHER _____																																																				
SOIL COLOR: <u>MED. GRAY</u>																																																				
COHESION (ALL OTHERS): <u>NON COHESIVE</u> / SLIGHTLY COHESIVE / COHESIVE / HIGHLY COHESIVE																																																				
CONSISTENCY (NON COHESIVE SOILS): <u>LOOSE</u> / <u>FIRM</u> / DENSE / VERY DENSE																																																				
PLASTICITY (CLAYS): <u>NON PLASTIC</u> / SLIGHTLY PLASTIC / COHESIVE / MEDIUM PLASTIC / HIGHLY PLASTIC																																																				
DENSITY (COHESIVE CLAYS & SILTS): <u>SOFT</u> / <u>FIRM</u> / <u>STIFF</u> / <u>VERY STIFF</u> / <u>HARD</u>																																																				
MOISTURE: <u>DRY</u> / <u>SLIGHTLY MOIST</u> / <u>MOIST</u> / <u>WET</u> / <u>SATURATED</u> / <u>SUPER SATURATED</u>																																																				
DISCOLORATION/STAINING OBSERVED: <u>YES</u> / NO EXPLANATION - <u>BET. 4-6' BELOW GRADE</u>																																																				
HC ODOR DETECTED: <u>YES</u> / NO EXPLANATION - <u>MED. GRAY SAND (STRONG)</u>																																																				
SAMPLE TYPE: <u>GRAB</u> / COMPOSITE - # OF PTS. <u>-</u>																																																				
ADDITIONAL COMMENTS: <u>CONDUCTED SAMPLING WITH HAND SHOVEL.</u>																																																				
FIELD 418.1 CALCULATIONS																																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>SAMP. TIME</th> <th>SAMPLE I.D.</th> <th>LAB No:</th> <th>WEIGHT (g)</th> <th>mL. FREON</th> <th>DILUTION</th> <th>READING</th> <th>CALC. ppm</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>			SAMP. TIME	SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm																																										
SAMP. TIME	SAMPLE I.D.	LAB No:	WEIGHT (g)	mL. FREON	DILUTION	READING	CALC. ppm																																													
PIT PERIMETER		PIT PROFILE																																																		
		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">OVM RESULTS</th> </tr> <tr> <th>SAMPLE ID</th> <th>FIELD HEADSPACE PID (ppm)</th> </tr> </thead> <tbody> <tr><td>1 @ 6'</td><td>1,015</td></tr> <tr><td>2 @</td><td> </td></tr> <tr><td>3 @</td><td> </td></tr> <tr><td>4 @</td><td> </td></tr> <tr><td>5 @</td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </tbody> </table> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3">LAB SAMPLES</th> </tr> <tr> <th>SAMPLE ID</th> <th>ANALYSIS</th> <th>TIME</th> </tr> </thead> <tbody> <tr><td>1 @ 6'</td><td>TPH (30158)</td><td>1130</td></tr> <tr><td>"</td><td>BTEX (30118)</td><td>"</td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	OVM RESULTS		SAMPLE ID	FIELD HEADSPACE PID (ppm)	1 @ 6'	1,015	2 @		3 @		4 @		5 @														LAB SAMPLES			SAMPLE ID	ANALYSIS	TIME	1 @ 6'	TPH (30158)	1130	"	BTEX (30118)	"												
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SAMPLE ID	ANALYSIS	TIME																																																		
1 @ 6'	TPH (30158)	1130																																																		
"	BTEX (30118)	"																																																		
P.D. = PIT DEPRESSION; B.G. = BELOW GRADE T.H. = TEST HOLE; ~ = APPROX.; B = BELOW																																																				
TRAVEL NOTES: CALLOUT: <u>3/12/02-MORN.</u> ONSITE: <u>3/12/02-MORN.</u>																																																				

revised: 02/27/02

bei1005C.skd

ENCLOSURE B – COMPLETION DIAGRAMS AND BOREHOLE LOGS

FIGURE 8

BLAGG ENGINEERING, INC.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

CLIENT: XTO ENERGY INC.
LOCATION NAME: RANDEL, O.H. #7 - SEP. PIT, UNIT D, SEC. 15, T26N, R11W
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: 240 FT., S76.5E FEET FROM WELL HEAD.

BORING #..... BH - 1
MW #..... 1
PAGE #..... 1
DATE STARTED 3/22/02
DATE FINISHED 3/22/02
OPERATOR..... JCB
PREPARED BY NJV

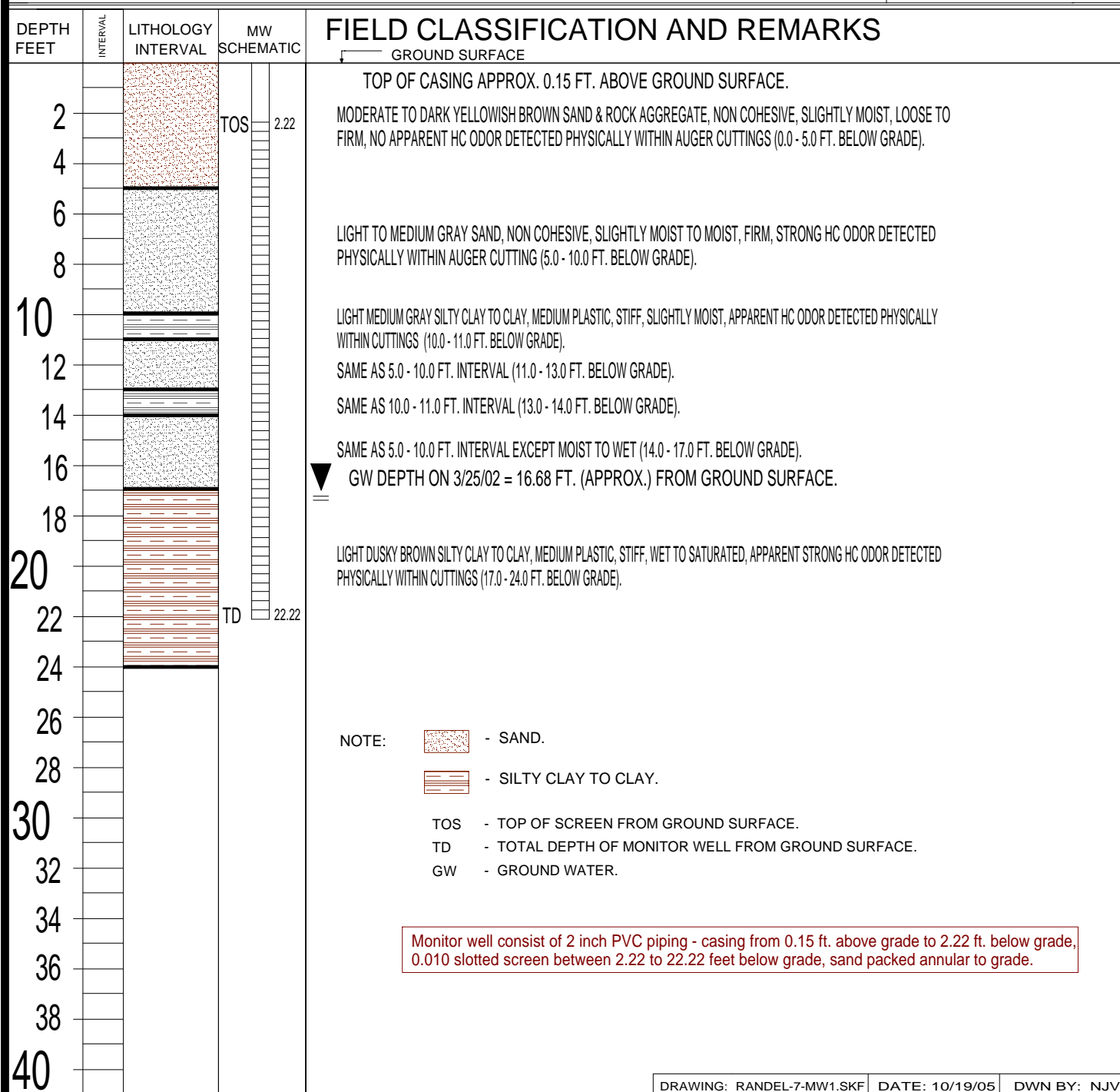


FIGURE 9

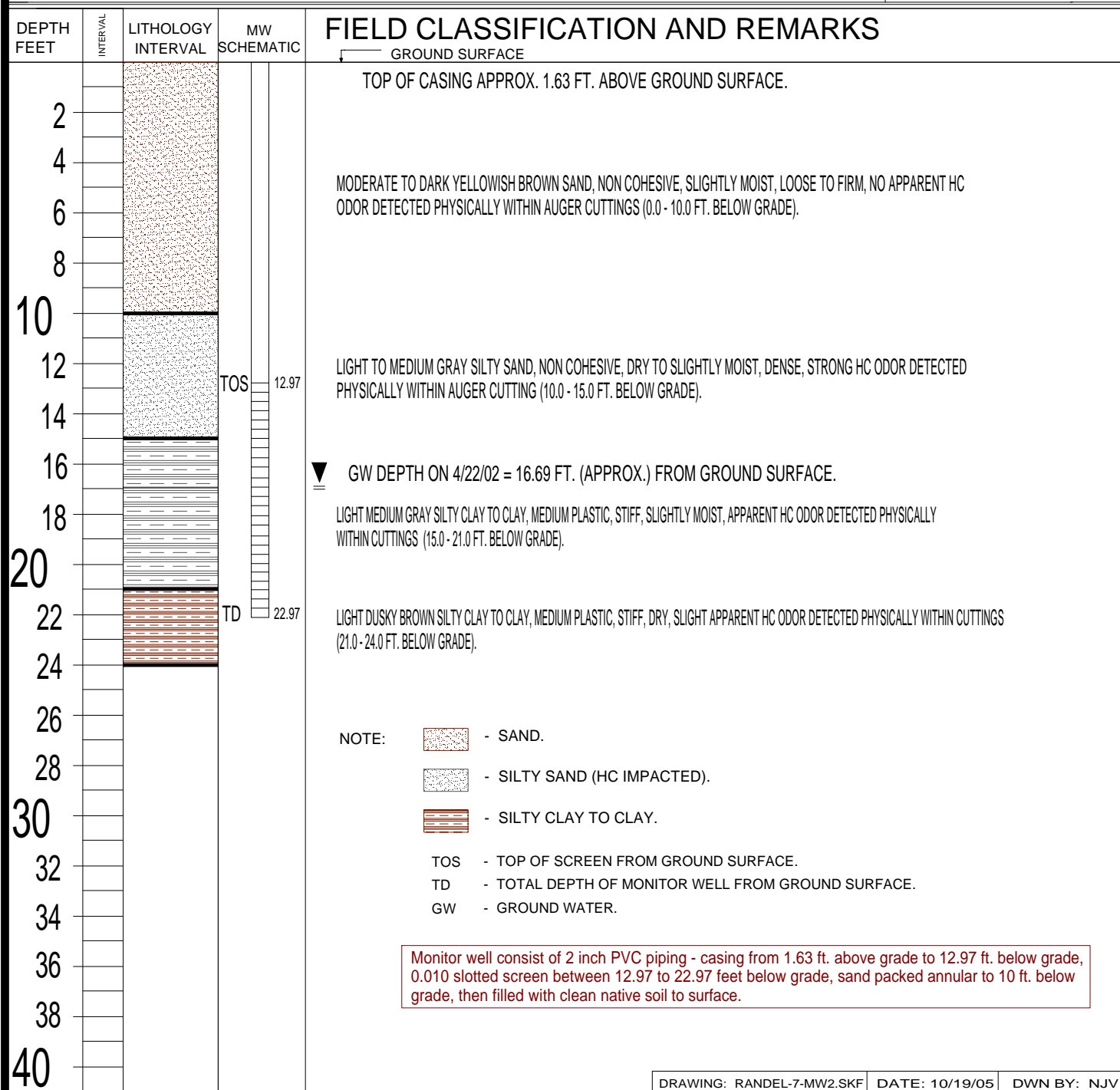
BLAGG ENGINEERING, INC.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

CLIENT: XTO ENERGY INC.
LOCATION NAME: RANDEL, O.H. #7 - SEP. PIT, UNIT D, SEC. 15, T26N, R11W
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHROBE)
BORING LOCATION: 274 FT., S87.5E FEET FROM WELL HEAD.

BORING #..... BH - 2
MW #..... 2
PAGE #..... 2
DATE STARTED 4/09/02
DATE FINISHED 4/09/02
OPERATOR..... JCB
PREPARED BY NJV



DRAWING: RANDEL-7-MW2.SKF DATE: 10/19/05 DWN BY: NJV

FIGURE 10

BLAGG ENGINEERING, INC.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

CLIENT: XTO ENERGY INC.
LOCATION NAME: RANDEL, O.H. #7 - SEP. PIT, UNIT D, SEC. 15, T26N, R11W
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHROBE)
BORING LOCATION: 158 FT., S80.5E FEET FROM WELL HEAD.

BORING #..... BH - 3
MW #..... 3
PAGE #..... 3
DATE STARTED 4/09/02
DATE FINISHED 4/09/02
OPERATOR..... JCB
PREPARED BY NJV

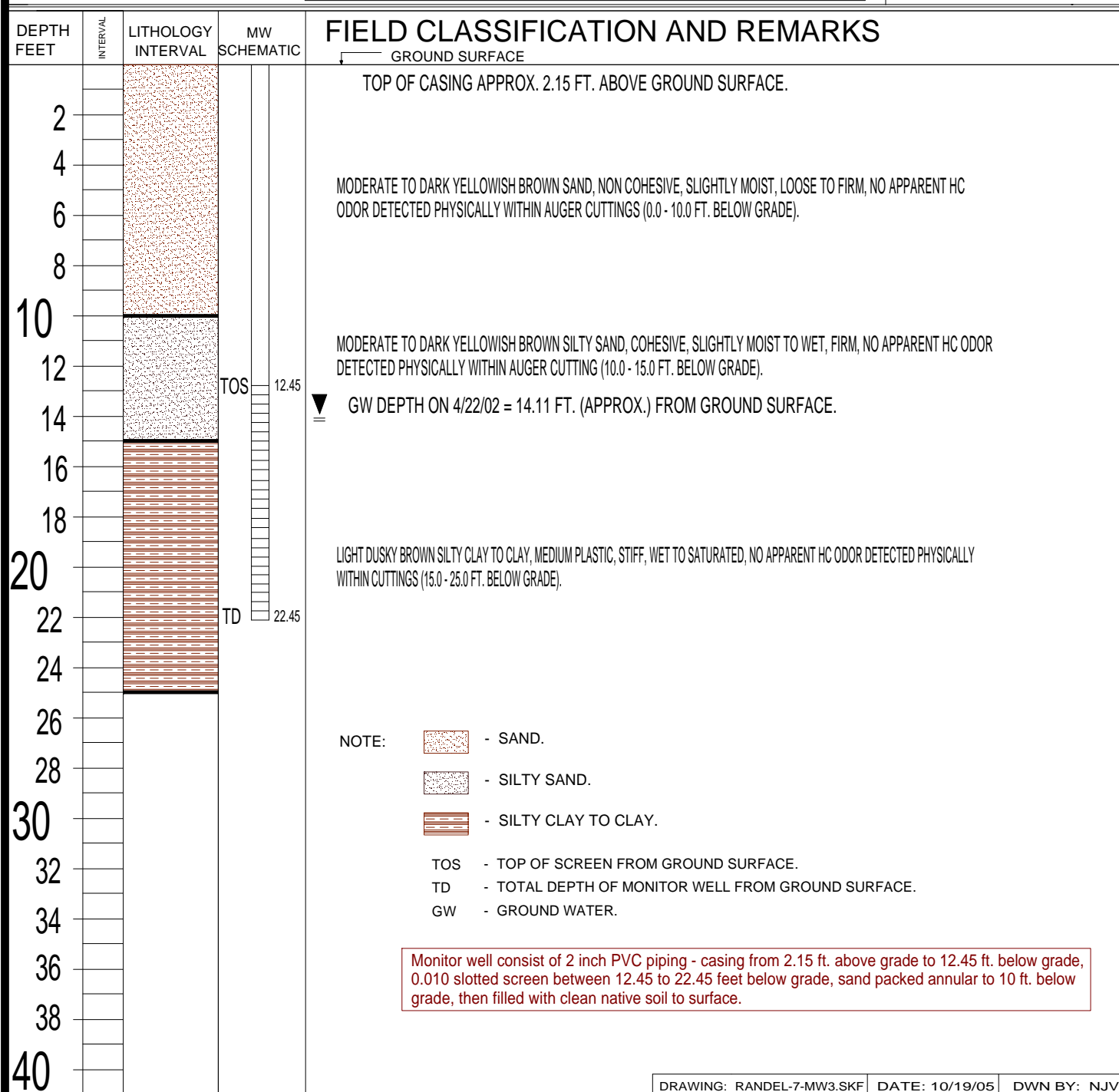


FIGURE 11

BLAGG ENGINEERING, INC.

P.O. BOX 87
BLOOMFIELD, NM 87413

(505) 632-1199

BORE / TEST HOLE REPORT

CLIENT: XTO ENERGY INC.
LOCATION NAME: RANDEL, O.H. #7 - SEP. PIT, UNIT D, SEC. 15, T26N, R11W
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: 210 FT., S56E FEET FROM WELL HEAD.

BORING #..... BH - 4
MW #..... 4
PAGE #..... 4
DATE STARTED 4/09/02
DATE FINISHED 4/09/02
OPERATOR..... JCB
PREPARED BY NJV

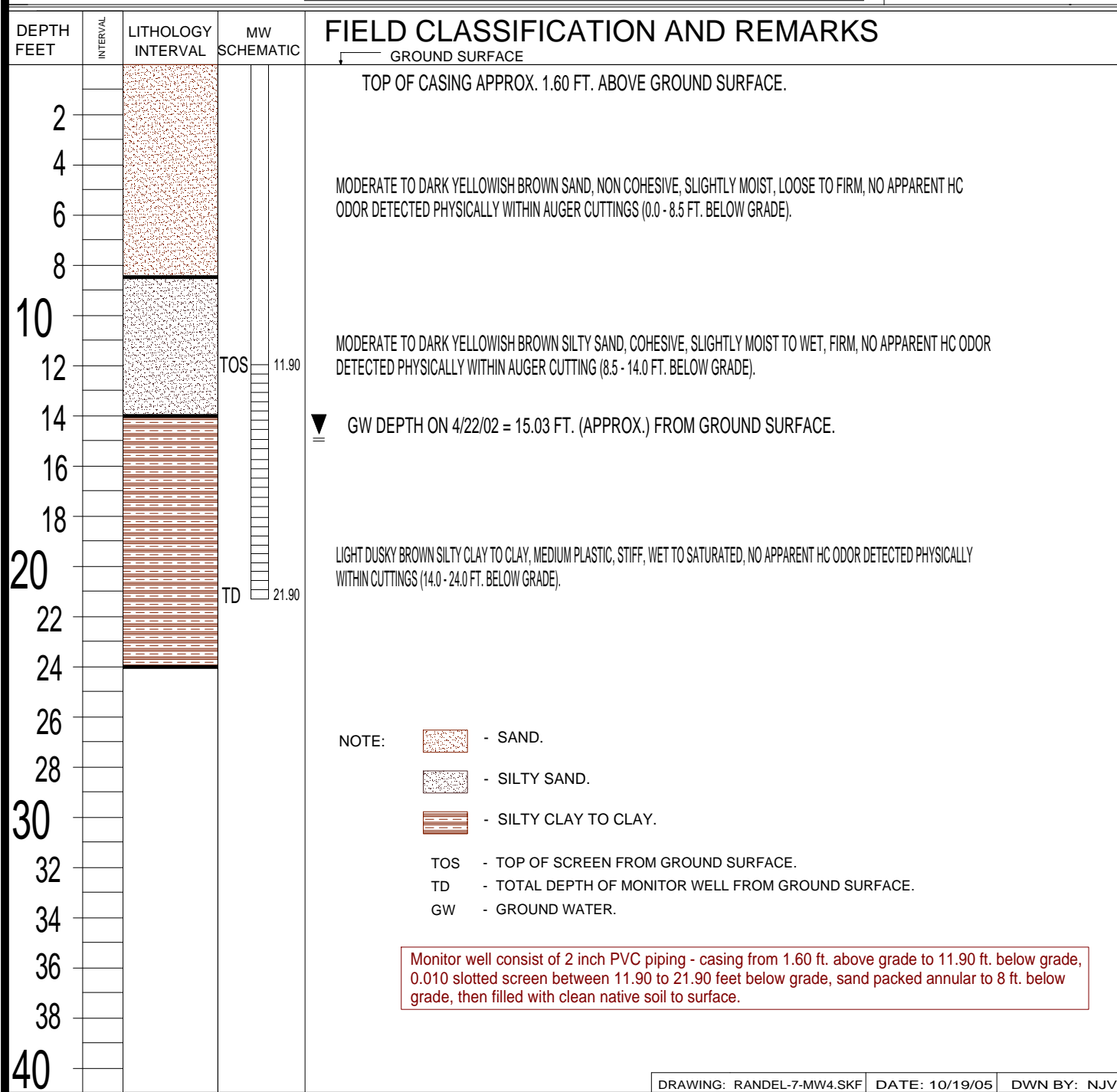


FIGURE 12

BLAGG ENGINEERING, INC.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

CLIENT: XTO ENERGY INC.
LOCATION NAME: RANDEL, O.H. #7 - SEP. PIT, UNIT D, SEC. 15, T26N, R11W
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: 312 FT., N86E FEET FROM WELL HEAD.

BORING #..... BH - 5
MW #..... 5
PAGE #..... 5
DATE STARTED 4/19/02
DATE FINISHED 4/19/02
OPERATOR..... JCB
PREPARED BY NJV

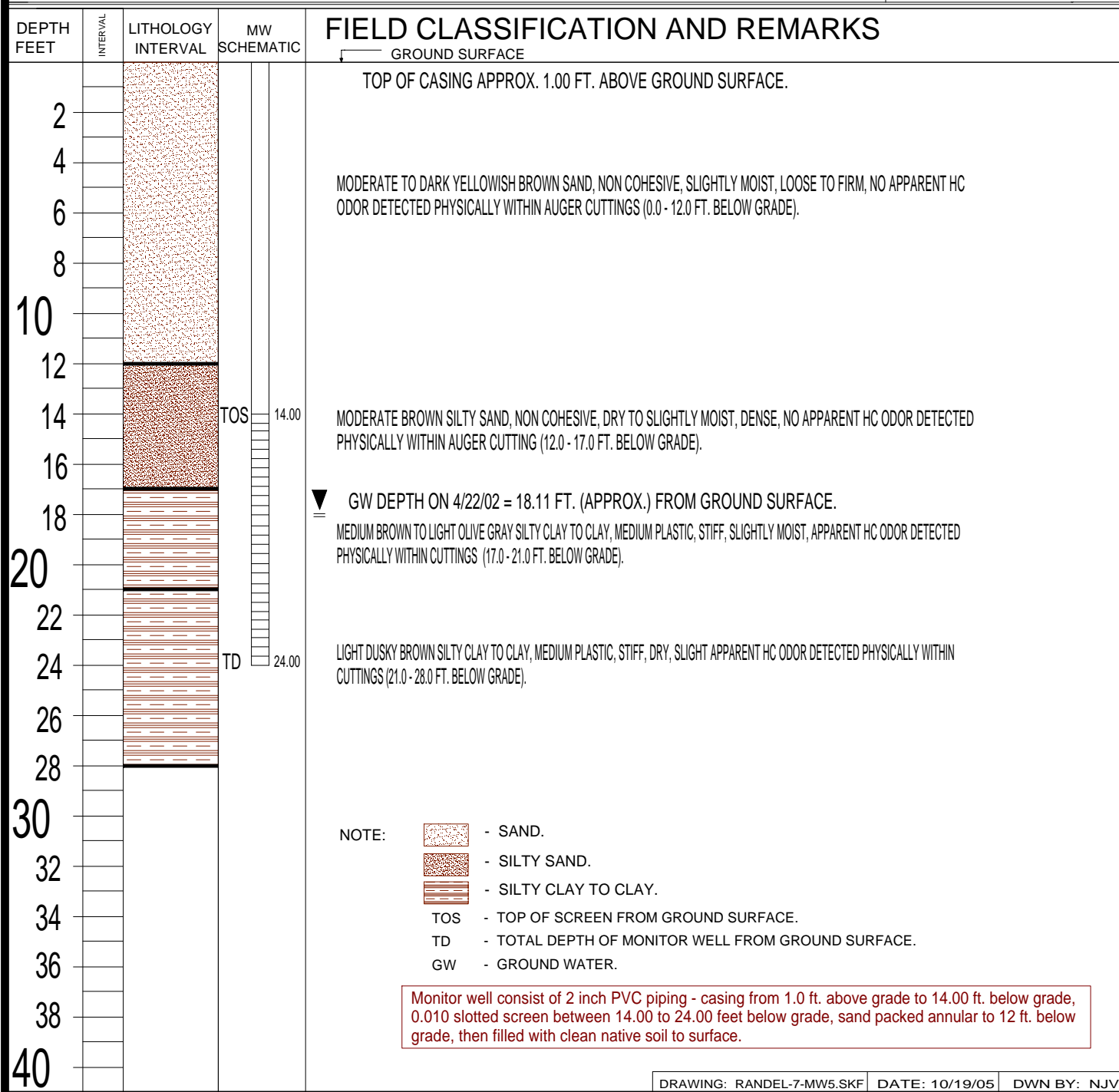


FIGURE 13

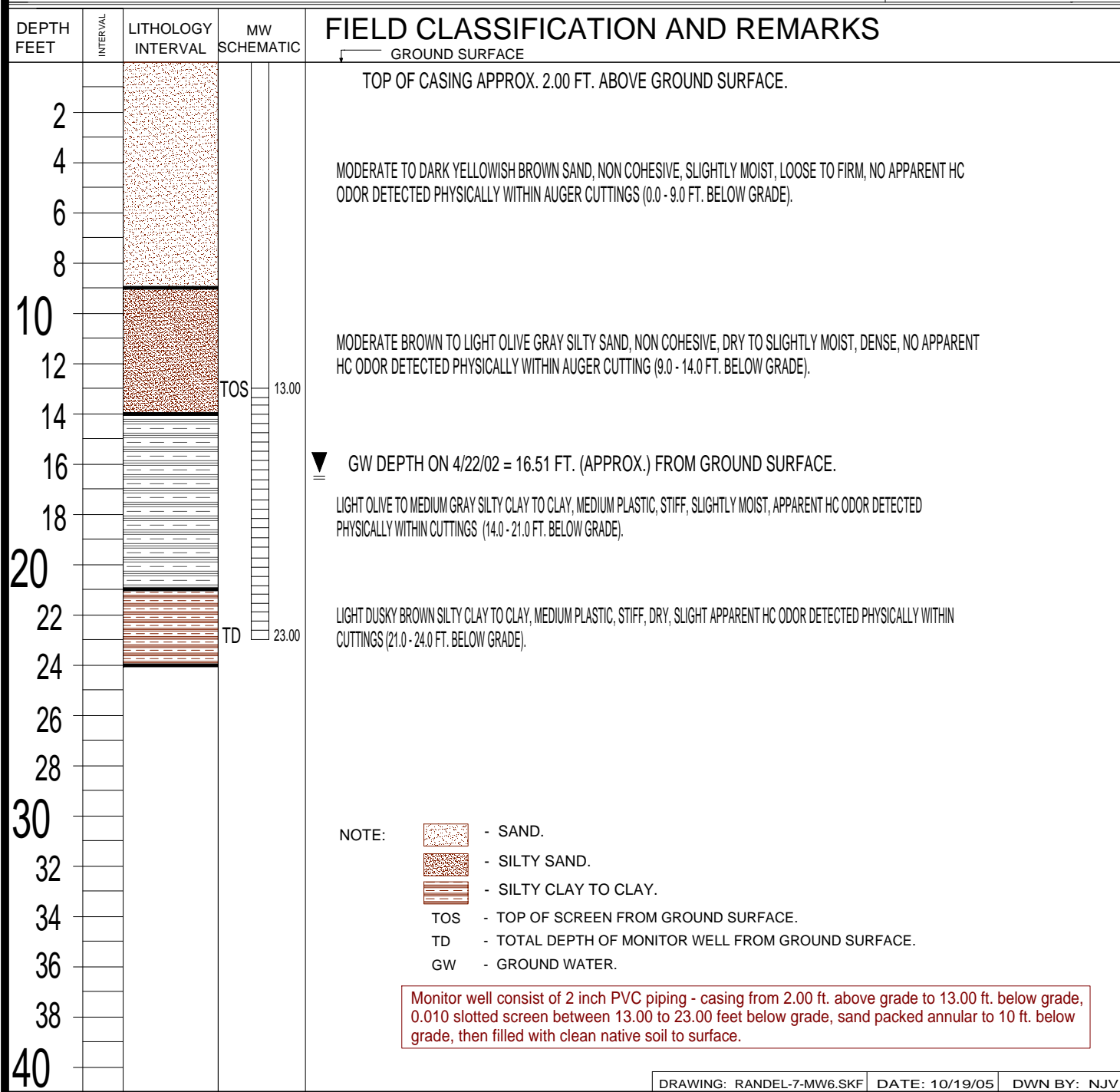
BLAGG ENGINEERING, INC.

P.O. BOX 87
BLOOMFIELD, NM 87413
(505) 632-1199

BORE / TEST HOLE REPORT

CLIENT: XTO ENERGY INC.
LOCATION NAME: RANDEL, O.H. #7 - SEP. PIT, UNIT D, SEC. 15, T26N, R11W
CONTRACTOR: BLAGG ENGINEERING, INC.
EQUIPMENT USED: MOBILE DRILL RIG (EARTHPROBE)
BORING LOCATION: 266 FT., S65.5E FEET FROM WELL HEAD.

BORING #..... BH - 6
MW #..... 6
PAGE #..... 6
DATE STARTED 4/19/02
DATE FINISHED 4/19/02
OPERATOR..... JCB
PREPARED BY NJV



RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: 1
Well #: MW-7
Page: 1 of 2

Project Number: _____
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29.508' N, 107° 59.720' W
GWL Depth: 19'
Drilled By: Enviro-Drill
Well Logged By: Ashley Ager
Date Started: 05/01/07
Date Completed: 05/01/07

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
0						
1	1	0-5'	cuttings	brown, unconsolidated, poorly sorted sand and gravel, damp	0	Easy
5	2	5-7'	split spoon	brown, unconsolidated, poorly sorted sand and gravel, damp	0	Easy
10	3	10-12	split spoon	10-10.5: brown, unconsolidated, poorly sorted sand and gravel, damp 10.5-12: whitish-brown medium sand, well sorted, unconsolidated, dry	0 0	Easy
15	4	15-17	split spoon	15-15.5: reddish brown coarse sand, poorly sorted, damp 15.5-16.5: brown clay with white chalkish material on top 16.5-17: reddish brown silty sand, coarse, poorly sorted, damp	7.2 0 0	Easy
20						

Comments: _____

Geologist Signature Ashley L. Ager

RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: 1
Well #: MW-7
Page: 2 of 2

Project Number: _____
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29.522' N, 107° 59.736' W
GWL Depth: 16.5
Drilled By: Enviro-Drill
Well Logged By: Ashley Ager
Date Started: 05/01/07
Date Completed: 05/01/07

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
20	5	20-22	split spoon	20-20.4: reddish brown, coarse sand, poorly sorted, damp 20.4-20.8: gray coarse sand, moist, poorly sorted 20.8-21: saturated gray coarse sand, poorly sorted	1.3 1.0 0.5	Easy
25	6	25-16	split spoon	21-22: reddish gray clay Variegated reddish brown clay, dry	0 0	Easy
30	7	30-32	split spoon	Variegated reddish brown clay, dry	0	Easy
35						
40						

Comments: Very thin saturated layer at approximately 20'. Stiff clay is present below that.
Wet layer probably represents a small perched aquifer atop the clay.

Geologist Signature Ashley L. Ager

RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: 1
Well #: MW-8
Page: 1 of 2

Project Number: _____
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29.522' N, 107° 59.736' W
GWL Depth: 16.5
Drilled By: Enviro-Drill
Well Logged By: Ashley Ager
Date Started: 05/01/07
Date Completed: 05/01/07

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
0						
1	1	0-5'	cuttings	brown, unconsolidated, poorly sorted sand and gravel, damp	0	Easy
5	2	5-7'	split spoon	brown, unconsolidated, poorly sorted sand and gravel, damp	0	Easy
10	3	10-11.8	split spoon	brown, unconsolidated, poorly sorted sand and gravel, damp	0	Easy
15	4	15-16.9	split spoon	15-15.8: brown, unconsolidated, poorly sorted sand and gravel 15.8-16.4: moist, grayish brown sandy silt 16.4-16.9: coarse, poorly sorted, grayish brown sand, wet, some HC odor	0 52.8 319	Easy Easy Easy
20						

Comments: _____

Geologist Signature Ashley L. Ager

RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: 1
Well #: MW-8
Page: 2 of 2

Project Number: _____
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29.522' N, 107° 59.736' W
GWL Depth: 16.5
Drilled By: Enviro-Drill
Well Logged By: Ashley Ager
Date Started: 05/01/07
Date Completed: 05/01/07

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
20	5	20-21.8	split spoon	20-20.4: reddish brown sand, coarse, poorly sorted, some gravel content, moist 20.4-21.8: variegated reddish gray stiff clay, moist	78.9 0.2	Easy Easy
25	6	25-27	split spoon	Variegated reddish brown clay wet at top, dry at bottom	0	Easy
30	7	30-32	split spoon	30-30.7: variegated reddish brown clay 30.7-31.8: greenish gray silty sand, coarse, poorly sorted, consolidated, dry	0 0	Steady
35						
40						

Comments: Very thin saturated layer at approximately 16.5'. Stiff clay is present below that.
Wet layer probably represents a small perched aquifer atop the clay.

Geologist Signature Ashley L. Ager

RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: B-1
Well #: MW-9
Page: 1 of 2

Project Number: _____
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29.531' N, 107° 59.731' W
GWL Depth: 16'
Drilled By: Kelly Padilla
Well Logged By: Ashley Ager
Date Started: 07/07/09
Date Completed: 07/07/09

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
0		0-5	cuttings	brown, poorly sorted coarse sand and gravel, road base		easy
5	1	5-7'	split spoon, 17"	0-13.5": 7.5 YR 5/6 strong brown sp, poorly sorted coarse sand, sub angular, dry, unconsolidated 13.5 - 17": 10YR 6/1 gray, sandy shale, crumbly	0	34 Blows
10	2	10-12	split spoon, 22"	10 YR 5/3 brown sp, poorly sorted, coarse sand, sub angular, dry	0	30 Blows
15	3	15-17	split spoon, 18"	0-2": same as above 2 - 16": 10 YR 5/3 brown sm, poorly sorted, medium sand w/ higher silt content, damp	0	25 Blows
20						

Comments:

Geologist Signature: Ashley L. Ager

RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: B-1
Well #: MW-9
Page: 2 of 2

Project Number: _____
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29.531' N, 107° 59.731' W
GWL Depth: 16'
Drilled By: Kelly Padilla
Well Logged By: Ashley Ager
Date Started: 07/07/09
Date Completed: 07/07/09

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
20	4	20-22	split spoon, 20"	10 YR 3/2 v. dark grayish brown CL, clay some coarse sand at top, damp	0.1	68 Blows rod Wet
25	5	25-27	split spoon, 18"	10 YR 7/2 light gray CL, clay interbedded with 10 yr 4/2 dark grayish brown clays, iron discoloration, dry	0	58 Blows
30	6	30-32	split spoon, 18"	same as above, dry	0	76 Blows
35	7	35-37'	split spoon, 15"	same as above, dry	0	41 Blows
40						

Comments: Drilling stopped at 35' based on previous knowledge of depth in existing monitoring wells.
Identified damp sandy layer at 16', and hole is dry after drilling to 37'.
Will let sit and see if water fills in. 3" of water in hole after 30 mins. Set well.

Geologist Signature: Ashley L. Ager

RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: B-2
Well #: _____
Page: 1 of 2

Project Number: _____
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29' 30.46" N, 107° 59' 44.2" W
GWL Depth: Dry Hole
Drilled By: Kelly Padilla
Well Logged By: Ashley Ager
Date Started: 07/07/09
Date Completed: 07/08/09

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
0		0-5'	cuttings	brown poorly sorted coarse sand and gravel - road base		easy
5	1	5-7'	split spoon, 11"	2.5 Y 6/1 Gray coarse sand sp, subrounded, backfill	0	Easy, 26 Blows
10	2	10-12	split spoon, 16"	2.5 Y 4/2 dark grayish brown, fine sand, poorly sorted, lots of fines	0	25 Blows
15	3	15-17	split spoon, 10"	2.5 Y 4/1 Dark Gray, fine silty sand, about 5% c. content, damp, backfill	0	12 Blows rod Wet
20						

Comments:

Geologist Signature: Ashley L. Ager

RECORD OF SUBSURFACE EXPLORATION

LodeStar Services
P.O. Box 4465
Durango, CO 81302
303-917-6288

Borehole #: B-2
Well #:
Page: 2 of 2

Project Number:
Project Name: XTO Ground Water
Project Location: OH Randel #7

Borehole Location: 36° 29' 30.46" N, 107° 59' 44.2" W
GWL Depth: dry hole
Drilled By: Kelly Padilla
Well Logged By: Ashley Ager
Date Started: 07/07/09
Date Completed: 07/08/09

Drilling Method: Hollow Stem Auger
Air Monitoring Method: PID

Depth (feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description	Air Monitoring	Drilling Conditions
20	4	20-22	split spoon, 19"	5 YR 3/2 Dark reddish brown CL, Clay, damp	0.1	59 Blows
25	5	25-27	split spoon, 16.5"	0 - 2": same as above 2-16.5": 10YR 6/2 light brownish gray, silty clay, dry	0	66 Blows
30	6	30-32	split spoon, 14"	same as above, damp	0	48 Blows
35	7	35-37'	split spoon, 9"	same as above, dry Stop to see if it fills	11.2	45 Blows
40						

Comments: Drilling stopped at 35' based on previous knowledge of depth in existing monitoring wells.
Identified damp sandy layer at ~16' and hole is dry after drilling to 37'. Let sit for 2 hours and
did not fill in. Let sit overnight. At 11:15 am on 07/08/09, hole is still dry. Plug.

Geologist Signature: Ashley L. Ager

ENCLOSURE C – LODESTAR REMEDIATION WORK PLAN (2006)

**Lodestar Services, Inc.**

P.O. Box 3861, Farmington, NM 87499-3861, 505-334-2791

August 15, 2006

Mr. Steve Austin
Navajo Nation EPA
PO Box 1999
Shiprock, NM 87420

CERTIFIED MAIL: 7004 1160 0007 4952 1517**RE: OH Randel #7**

Dear Mr. Austin,

XTO Energy Inc. (XTO) has contracted Lodestar Services, Incorporated (Lodestar) to oversee groundwater monitoring and remedial activities at the OH Randel #7 natural gas production well. It has come to our attention that the well is located on land regulated by the Navajo Nation Environmental Protection Agency (NNEPA). Previous regulatory correspondence has been with the New Mexico Oil Conservation Division (NMOCD). An annual comprehensive report was submitted to the NMOCD in January 2006 and is included for your review.

The OH Randel #7 is located in Unit D of Section 16 of Township 26N, Range 11W, and includes a former oil-water-separator pit that may have affected shallow groundwater. Six groundwater monitoring wells were previously installed on the site to investigate groundwater quality. One of the wells, MW-6, contains free-phase hydrocarbons. Previously MW-1 and MW-2 contained free-phase hydrocarbons. MW-1 is located in the center of the former pit. MW-2 is directly adjacent to the pit, and MW-6 is located down gradient of the pit. The annual report included herein has several groundwater contour maps provided by Blagg Engineering that indicate varying groundwater flow directions. Navajo Agricultural Products Incorporated (NAPI) conducts irrigation adjacent to the site and may influence groundwater flow direction.

The following steps are proposed remove impacted soil and free-phase hydrocarbons:

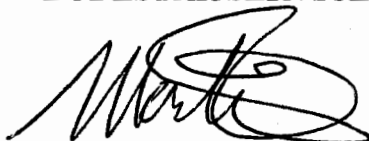
1. Excavate affected soil associated with historical operations from the former pit. Impacted soil will be disposed at a local land farm permitted by the NMOCD. Soil headspace gas will be monitored with a photo-ionization detector (PID) to determine extent of impacted soil during excavation according to the NMOCD Guidelines for headspace analysis. Soil above 10 milligrams per kilogram (mg/kg) benzene, 50 mg/kg total benzene, toluene, ethylbenzene, and xylenes (BTEX), and 100 mg/kg total petroleum hydrocarbons will be removed. Laboratory analyses of composite samples collected from the sidewalls of the excavation will be used to document that impacted soil has been removed.
2. Erect temporary fencing around the excavated site and remove impacted water and free-phase hydrocarbons from the pit.

Mr. Steve Austin
August 15, 2006
Page 2 of 2

3. Once the free-phase hydrocarbons have been removed, backfill the excavation site with clean soil.
4. Replace groundwater-monitoring wells as necessary.
5. Install additional down gradient monitoring wells as necessary to characterize impacted groundwater.
6. Remove free phase hydrocarbons from groundwater, then sample groundwater-monitoring wells for benzene, toluene, ethylbenzene and total xylenes (BTEX) on a quarterly basis to monitor progress at the site.

Following completion of the above tasks, XTO will provide a letter report describing onsite activities and analytical results. XTO wishes to complete this work as soon as practical and will contact you to schedule activities. Should you have any questions or require additional information, please do not hesitate to contact Lisa Winn of XTO at (505) 324-1090 or you can call me at (505) 334 2791.

Sincerely,
LODESTAR SERVICES, INC



Martin Nee

Cc: Lisa Winn, XTO, w/o enclosures
Kim Champlin, XTO, w/o enclosures
Ashley Ager, LSI, w/o enclosures
Glenn Von Gonten, NMOCD
File

Attachments: Annual Report

cc Mr Jim Walsh USEPA



Lodestar Services, Inc.

P.O. Box 3861, Farmington, NM 87499-3861, 505-334-2791

ENCLOSURE D – LODESTAR REPORT OF EXCAVATION AND SAMPLING AT OH
RANDEL #7 (2007)



PO Box 3861 Farmington, NM 87499-3861 Office (505) 334-2791

January 29, 2007

Mr. William Freeman
Navajo Nation Environmental Protection Agency
PO Box 1999
Shiprock, NM 87420

RE: Report of Excavation and Sampling at OH Randel #7

Dear Mr. Freeman:

XTO Energy Inc. (XTO) operates the OH Randel #7 natural gas production well located in Unit D of Section 16 of Township 26N, Range 11W, San Juan County, New Mexico. A former oil-water-separator pit may have impacted soil and shallow groundwater at the site. On August 15, 2006, XTO submitted a work plan to the Navajo Nation Environmental Protection Agency (NNEPA) describing planned remedial activities to investigate and remove impacted soil. XTO contracted Lodestar Services, Incorporated (Lodestar) to direct excavation activities according to the August 15 work plan. Core Oilfield Services completed the excavation, backfilling, and transportation of impacted soil to Envirotech Inc.'s land farm. Clean backfill was purchased from Moss Excavation's gravel pit located on highway 550 in Bloomfield, NM.

On November 13-27, 2006, a geologist from Lodestar was present during excavation of impacted soil at the OH Randel #7. During excavation, field screening according to the New Mexico Oil Conservation Division's (NMOCD) guidelines for headspace analysis was conducted to determine extent of impacted soil by collecting samples from the sidewalls and floor of the excavated pit. Following headspace screening and excavation, composite samples from the sidewalls and floor of the excavation were collected for laboratory analysis. Samples were collected where field screening indicated the highest concentrations of hydrocarbons. Compositing included placing four aliquots of soil from a given wall or floor into a one-gallon plastic bag. The soil within the bag was thoroughly mixed before filling a four-ounce glass jar. The sample was immediately placed on ice, and maintained under strict chain-of-custody until delivered to Envirotech Laboratories in Farmington, NM. Envirotech Laboratories analyzed the samples for benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) by United States Environmental Protection Agency (USEPA) methods 8021 and 8015, respectively. The results of sample analyses are as follows:

	GRO (ppm)	DRO (ppm)	TPH (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	P&M Xylenes (ppb)	O Xylenes (ppb)	Total BTEX (ppb)
NMOCD Standard			100	10,000					50,000
North Excavation North Wall	2.6	3.6	6.2	2.2	20.3	39.1	374	64.8	500
North Excavation East Wall	1080	266	1350	518	3230	3290	9590	3610	20240

Mr. William Freeman

January 29, 2007

Page 2 of 2

	GRO (ppm)	DRO (ppm)	TPH (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	P&M Xylenes (ppb)	O Xylenes (ppb)	Total BTEX (ppb)
NMOCD Standard			100	10,000					50,000
North Excavation West Wall	8.0	ND	8.0	2.0	746	889	2170	979	4790
North Excavation Floor	3.6	ND	3.6	10.5	65.9	119	619	202	1020
South Excavation East Wall	5.2	15.0	20.2	7.4	50.7	16.7	78.6	37.0	190
South Excavation West Wall	0.5	0.4	0.9	3.3	9.1	19.6	84.7	28.4	145
South Excavation Floor	ND	ND	ND	ND	4.4	7.7	24.5	5.3	41.9
South Excavation South Wall	ND	ND	ND	ND	1.9	7.9	24.8	8.7	43.3

GRO: Gasoline Range Organics; DRO: Diesel Range Organics;

ND: Not Detected in sample; ppm: parts per million; ppb: parts per billion

Approximately six thousand eight hundred and eighty two cubic yards of soil were removed for treatment to the land farm. Lodestar and XTO met with the USEPA and the NNEPA on November 27, 2006 at the job site and received permission to backfill the excavation based on the above results.

Six groundwater monitoring wells were previously installed on the site to investigate groundwater quality. Three of the wells, MW-1, MW-2, and MW-6 were removed during excavation activities.

Laboratory reports and Bill-of-Lading copies are attached. Please contact Lisa Winn of XTO at (505) 324-1090 with any questions that may arise.

Sincerely,

Lodestar Services, Inc.

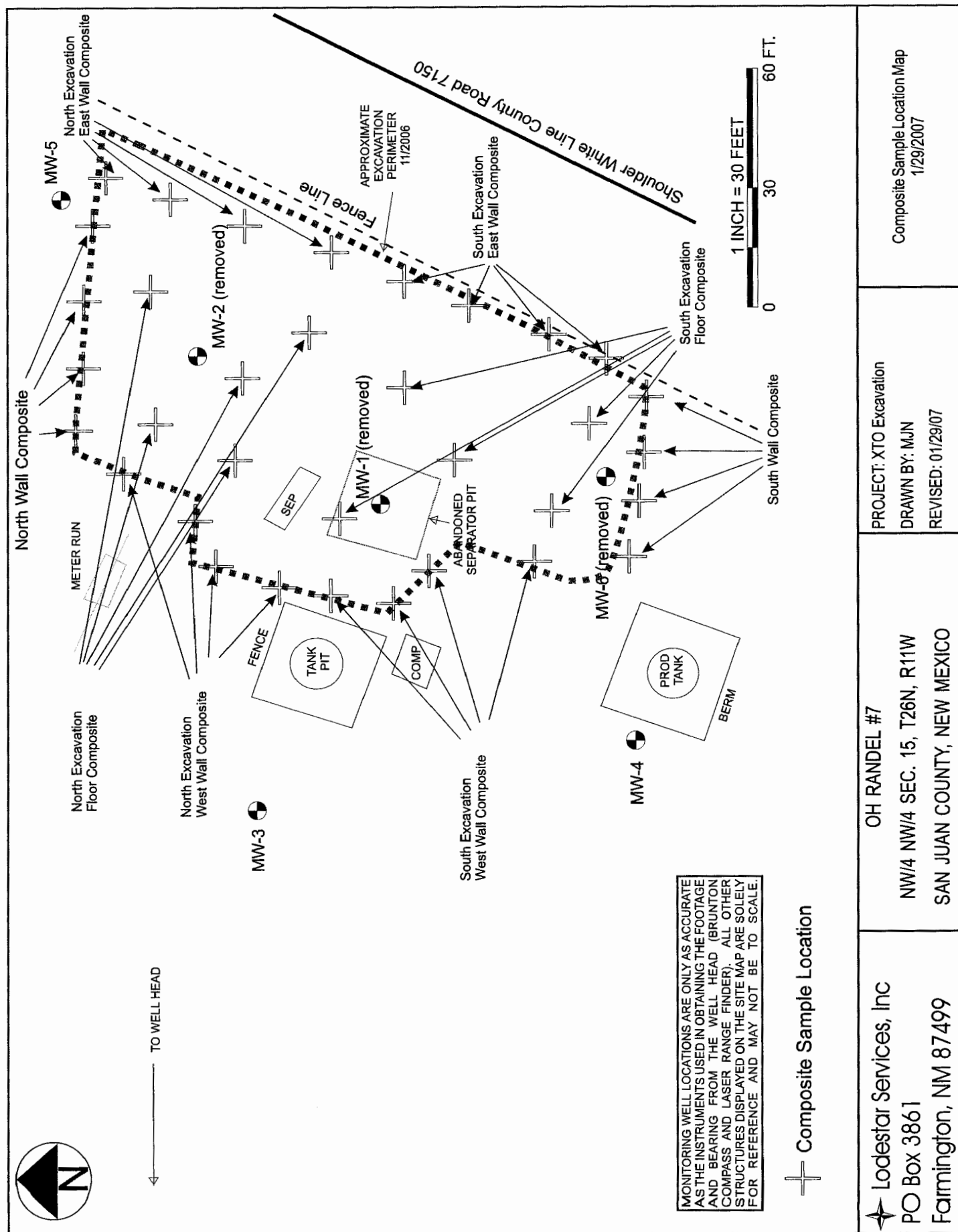


Martin Nee

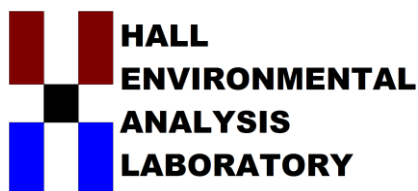
Cc: Jim Walker, USEPA
 Lisa Winn, XTO Energy
 Kim Champlin, XTO Energy
 Ashley Ager, Lodestar Services



Lodestar Services, Incorporated PO Box 3861 Farmington, NM 87499 (505) 334-2791



ENCLOSURE E – 2020 LABORATORY ANALYTICAL REPORTS



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

July 01, 2020

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

RE: OH Randel #7

OrderNo.: 2006B22

Dear Jennifer Deal:

Hall Environmental Analysis Laboratory received 1 sample(s) on 6/23/2020 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 2006B22

Date Reported: 7/1/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: HILCORP ENERGY

Client Sample ID: MW 7

Project: OH Randel #7

Collection Date: 6/22/2020 11:00:00 AM

Lab ID: 2006B22-001

Matrix: AQUEOUS

Received Date: 6/23/2020 8:05:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: DJF
Benzene	830	50	P	µg/L	50	6/26/2020 3:20:08 PM	SL69947
Toluene	ND	5.0	P	µg/L	5	6/26/2020 3:48:44 PM	SL69947
Ethylbenzene	22	5.0	P	µg/L	5	6/26/2020 3:48:44 PM	SL69947
Xylenes, Total	640	7.5	P	µg/L	5	6/26/2020 3:48:44 PM	SL69947
Surr: 1,2-Dichloroethane-d4	105	70-130	P	%Rec	5	6/26/2020 3:48:44 PM	SL69947
Surr: 4-Bromofluorobenzene	98.5	70-130	P	%Rec	5	6/26/2020 3:48:44 PM	SL69947
Surr: Dibromofluoromethane	103	70-130	P	%Rec	5	6/26/2020 3:48:44 PM	SL69947
Surr: Toluene-d8	102	70-130	P	%Rec	5	6/26/2020 3:48:44 PM	SL69947

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 3

QC SUMMARY REPORT**Hall Environmental Analysis Laboratory, Inc.**WO#: **2006B22****08-Jul-20****Client:** HILCORP ENERGY**Project:** OH Randel #7

Sample ID: mb1	SampType: MBLK	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: PBW	Batch ID: SL69947	RunNo: 69947								
Prep Date:	Analysis Date: 6/26/2020	SeqNo: 2429275 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		107	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		96.1	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID: 100ng lcs	SampType: LCS	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: LCSW	Batch ID: SL69947	RunNo: 69947								
Prep Date:	Analysis Date: 6/26/2020	SeqNo: 2429276 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	114	70	130			
Toluene	20	1.0	20.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		111	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.6	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.4	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID: 2006b22-001a ms	SampType: MS	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: MW 7	Batch ID: SL69947	RunNo: 69947								
Prep Date:	Analysis Date: 6/26/2020	SeqNo: 2429279 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	960	5.0	100.0	795.1	162	70	130			ESP
Toluene	100	5.0	100.0	0	103	70	130			P
Surr: 1,2-Dichloroethane-d4	54		50.00		108	70	130			P
Surr: 4-Bromofluorobenzene	47		50.00		94.0	70	130			P
Surr: Dibromofluoromethane	48		50.00		96.3	70	130			P
Surr: Toluene-d8	51		50.00		103	70	130			P

Sample ID: 2006b22-001a msd	SampType: MSD	TestCode: EPA Method 8260: Volatiles Short List								
Client ID: MW 7	Batch ID: SL69947	RunNo: 69947								
Prep Date:	Analysis Date: 6/26/2020	SeqNo: 2429280 Units: µg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	940	5.0	100.0	795.1	142	70	130	2.09	20	ESP
Toluene	97	5.0	100.0	0	96.7	70	130	6.46	20	P

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#: 2006B22

08-Jul-20

Client: HILCORP ENERGY

Project: OH Randel #7

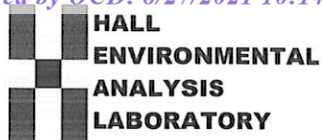
Sample ID: 2006b22-001a msd		SampType: MSD		TestCode: EPA Method 8260: Volatiles Short List						
Client ID: MW 7		Batch ID: SL69947		RunNo: 69947						
Prep Date:		Analysis Date: 6/26/2020		SeqNo: 2429280		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	56		50.00		112	70	130	0	0	P
Surr: 4-Bromofluorobenzene	49		50.00		98.3	70	130	0	0	P
Surr: Dibromofluoromethane	49		50.00		98.3	70	130	0	0	P
Surr: Toluene-d8	50		50.00		100	70	130	0	0	P

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

Page 3 of 3



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

Sample Log-In Check List

Client Name: HILCORP ENERGY

Work Order Number: 2006B22

RcptNo: 1

Received By: Emily Mocho 6/23/2020 8:05:00 AM

Completed By: Emily Mocho 6/23/2020 8:16:21 AM

Reviewed By: DAD 6/23/20

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:
(<2 or >12 unless noted)

Adjusted? _____

Checked by: SPA 6.23.20

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: _____

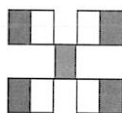
16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.0	Good	Not Present			

[illegible]

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

[illegible]

Remarks: Please cc' Sadams@Ltenv.com
TShort@Ltenv.com



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

December 23, 2020

Josh Adams

Hilcorp Energy

PO Box 61529

Houston, TX 77208-1529

TEL: (337) 276-7676

FAX

RE: OH Randel 7

OrderNo.: 2012702

Dear Josh Adams:

Hall Environmental Analysis Laboratory received 1 sample(s) on 12/15/2020 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 2012702

Date Reported: 12/23/2020

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Hilcorp Energy

Client Sample ID: MW-7

Project: OH Randel 7

Collection Date: 12/14/2020 12:30:00 PM

Lab ID: 2012702-001

Matrix: AQUEOUS

Received Date: 12/15/2020 8:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: DJF
Benzene	9400	200		µg/L	200	12/18/2020 4:24:37 PM	R74129
Toluene	ND	20		µg/L	20	12/18/2020 6:53:26 AM	R74108
Ethylbenzene	470	20		µg/L	20	12/18/2020 6:53:26 AM	R74108
Xylenes, Total	6600	300		µg/L	200	12/18/2020 4:24:37 PM	R74129
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	20	12/18/2020 6:53:26 AM	R74108
Surr: Dibromofluoromethane	108	70-130		%Rec	20	12/18/2020 6:53:26 AM	R74108
Surr: Toluene-d8	97.6	70-130		%Rec	20	12/18/2020 6:53:26 AM	R74108

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 2

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

WO#: 2012702

23-Dec-20

Client: Hilcorp Energy**Project:** OH Randel 7

Sample ID: mb	SampType: MBLK			TestCode: EPA Method 8260: Volatiles Short List						
Client ID: PBW	Batch ID: R74108			RunNo: 74108						
Prep Date:	Analysis Date: 12/18/2020			SeqNo: 2615296		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	9.8		10.00		97.8	70	130			

Sample ID: 100ng lcs	SampType: LCS			TestCode: EPA Method 8260: Volatiles Short List						
Client ID: LCSW	Batch ID: R74108			RunNo: 74108						
Prep Date:	Analysis Date: 12/18/2020			SeqNo: 2615297		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	21	1.0	20.00	0	106	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		103	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.7		10.00		97.4	70	130			

Sample ID: mb1	SampType: MBLK			TestCode: EPA Method 8260: Volatiles Short List						
Client ID: PBW	Batch ID: R74129			RunNo: 74129						
Prep Date:	Analysis Date: 12/18/2020			SeqNo: 2615808		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.0	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	10		10.00		105	70	130			
Surr: Toluene-d8	9.6		10.00		96.2	70	130			

Sample ID: 100ng lcs	SampType: LCS			TestCode: EPA Method 8260: Volatiles Short List						
Client ID: LCSW	Batch ID: R74129			RunNo: 74129						
Prep Date:	Analysis Date: 12/18/2020			SeqNo: 2615809		Units: µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	106	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	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

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: **2012702**

RcptNo: 1

Received By: **Sean Livingston**

12/15/2020 8:00:00 AM

Completed By: **Emily Mocho**

12/15/2020 8:17:06 AM

Reviewed By:

JE 12/15/20

SGL

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:

(<2 or >12 unless noted)

Adjusted? _____

Checked by: SGL 12/15/20

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: _____

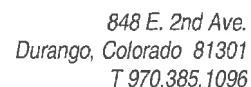
Client Instructions: _____

16. Additional remarks:

17. Cooler Information

Cooler No	Temp $^{\circ}\text{C}$	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.2	Good	Yes			

ENCLOSURE F – 2020 GROUNDWATER SAMPLE COLLECTION FORMS



Groundwater Sample Collection Form

Vol. of Water to Purge: 4.2 gallons (height of water column * 0.1631 for 2" well or 0.6524 for 4" well) * 3 well vols

Method of Purging: PVC Bailer

Method of Sampling: PVC Bailer

[illegible]

Date:

6/22/2020
~~6/23/2020~~



848 E. 2nd Ave.
Durango, Colorado 81301
T 970.385.1096

Date: 12/14/2020

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 44827

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID:
	372171
	Action Number: 44827
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
nvelez	Review of 2020 Annual Groundwater Monitoring Report: Content satisfactory 1. Continued monitoring of groundwater elevations semi-annually in all monitoring wells and collecting groundwater samples semi-annually from monitoring well MW-7 in 2021 2. Submit a more active remediation options proposal for MW-7 3. Submit the Annual Monitoring Report to the OCD no later than March 31, 2022	1/3/2022