March 16

2022

Order No. 1RP-313
2021 Semi-Annual Groundwater Monitoring Report (June – December)
Northeast Drinkard Unit #829, #830, #922, #928 and #929
Lea County, New Mexico

Prepared for:

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1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) has prepared this 2021 semi-annual groundwater monitoring report for the Northeast Drinkard Unit (NEDU) #829, 830, 922, 928, and 929 (Sites) located in Lea County, New Mexico. The report is prepared on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) District 1 in Hobbs and Santa Fe, New Mexico. This semi-annual report presents field and laboratory analysis of groundwater samples collected from four (4) groundwater monitoring wells (MW-1, MW-2, MW-3, and MW-4) during the third (3rd) quarter (July 29, 2021) and fourth (4th) quarter (November 8, 2021). The Sites are located in Section 22, Township 21 South, Range 37 East, in Lea County, New Mexico.

The following observations are documented in the report:

- The apparent groundwater flow direction was from west to east at a gradient of approximately 0.01 ft/ft, on July 29-30, 2021, and November 8, 2021.
- BTEX concentrations were below the analytical method RL and New Mexico WQCC human health standards in groundwater samples from monitoring wells MW-1, MW-3, and MW-4 on July 29-30, 2021.
- The benzene concentration in the sample from monitoring well MW-2 (0.0391 mg/L) was above the WQCC human health standard of 0.005 mg/L, on July 29, 2021.
- BTEX concentration were below the RL and WQCC human health standards in all wells on November 8, 2021.
- The chloride concentration in the samples from monitoring wells MW-1 (446 mg/L), MW-2 (268 mg/L), and MW-4 (559 mg/L) was above the WQCC domestic water quality standard of 250 mg/L, on July 29-30, 2021.
- The chloride concentration in the sample from monitoring well MW-3 (128 mg/L) was below the WQCC domestic water quality standard of 250 mg/L, on July 29-30, 2021.
- The TDS concentration was below the WQCC domestic water quality standard of 1000 mg/L in groundwater samples from monitoring well MW-3 (663 mg/L), on July 29-30, 2021, and in samples from monitoring wells MW-3 (644 mg/L) and MW-4 (832 mg/K) on November 8, 2021.
- TDS concentrations in the groundwater samples from wells MW-1 (2,510 mg/L), MW-2 (1,170 mg/L), and MW-4 (1,030 mg/L) were above the WQCC domestic water quality standard (1,000 mg/L) on July 29 – 30, 2021.
- TDS concentrations in the groundwater samples from wells MW-1 (2,490 mg/L) and MW-2 (1,100 mg/L) were above the WQCC domestic water quality standard (1,000 mg/L) on November 8, 2021.

Apache proposes the following:

- Continue groundwater monitoring on a quarterly (4 times per year) schedule.
- Gauge all monitoring wells for depth to groundwater and collect groundwater samples from monitoring wells with sufficient groundwater during each quarterly event.
- Analyze samples for BTEX, TDS and chloride.
- Report the laboratory results to NMOCD in quarterly reports, unless significant changes in analyte concentrations are detected, at which time Apache will immediately report the results to NMOCD.

- Apache will provide notice to the NMOCD in Hobbs and Santa Fe, New Mexico, at least 7 working days prior to each monitoring event.

2.0 INTRODUCTON

Larson & Associates, Inc. (LAI) has prepared this report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) District 1 in and Hobbs and Santa Fe, New Mexico. This report presents 2021 semi-annual groundwater monitoring results for the third (3rd) quarter on July 29, 2021, and fourth (4th) quarter on November 8, 2021. During each quarterly event groundwater samples were collected from four (4) monitor wells (MW-1 through MW-4) at the Northeast Drinkard Unit (NEDU) #829, 830, 922, 928, and 929 (Sites) located in Lea County, New Mexico. The legal description is Section 22, Township 21 South, Range 37 East. The geodetic coordinates are as follows:

Site	North (°)	West (°)
NEDU #829	32.462947	-103.151539
NEDU #830	32.463967	-103.155761
NEDU #922	32.457803	-103.151181
NEDU #928	32.458019	-103.155831
NEDU #929	32.458022	-103.151450

Figure 1 presents a topographic map. Figure 2 presents an aerial map.

2.1 Background

On April 6, 2001, the landowner reported to NMOCD that drilling pits were being closed by disposing pit fluid in an open trench excavated adjacent to the pit. Apache was notified and submitted the initial C-141 on April 23, 2001. NMOCD assigned the trenches remediation permit 1RP-313.

On April 23, 2001, Apache submitted a work plan for the remediating the trenches which OCD approved on May 8, 2001. The work plan stated that the trenches at wells #829, #830 and #929 would be excavated to approximately 19 feet bgs and to approximately 13 feet bgs at #928. There is no evidence that the trench at #922 was excavated. An Apache contractor collected bottom and composite samples from the excavations and reported chloride above the remediation closure limits in effect at that time from all excavations. Total petroleum hydrocarbons (TPH) were reported above the NMOCD closure limits in the excavation at #928. No documentation is available in the OCD online files to confirm the remediation.

On October 31, 2019, LAI prepared an administrative summary and path forward that Apache submitted to the NMOCD. The plan requested approval for a variance to excavate soil to a depth of approximately four (4) feet below ground surface (bgs) at each trench and install a 20-mil polyethylene liner in the bottom of the excavations. Additionally, Apache committed to installing a monitoring well hydraulically down gradient (east - southeast) approximately 50 feet from each trench except EBDU #829 where chloride was delineated vertically and horizontally to 600 milligrams per kilogram (mg/Kg). On May 19, 2021, NMOCD approved the administrative summary and path forward for remediation but stated that “preapproval for monitor well locations on map before installation” was required. On July 14, 2021, NMOCD approved the monitor well locations. Appendix A presents the NMOCD correspondence.

3.0 GROUNDWATER INVESTIGATION

3.1 Monitoring Well Installation

On July 19 - 20, 2021, Scarborough Drilling, Inc. (SDI) under the supervision of LAI, installed the monitoring wells utilizing an air rotary drilling rig. Five (5) inch diameter borings were advanced between about 65 and 76 feet bgs. The monitoring wells were completed at depths of approximately 74.08, 74.86, 65.35 and 76.01 feet bgs, respectively. The monitoring wells were constructed with 2-inch schedule 40 threaded PVC casing and 20 feet of 0.010-inch factory slotted screen was positioned above and below the groundwater level observed during drilling. Graded silica sand is placed around the well screens to about 2 feet above the screen. Sodium bentonite chips extend around the PVC riser and above the sand to about 1-foot bgs. The wells are secured with locking steel sleeves anchored in concrete. West Company, a State of New Mexico licensed Professional Land Surveyor (License Number 23263) surveyed the monitoring wells for location and elevation including top of casing and natural ground surface. Figure 3a through Figure 3d present Site drawings showing the monitoring well locations. Table 1 presents the monitoring well completion and gauging summary. Appendix B presents the monitoring well completion records.

On July 27-30, 2021, LAI personnel developed the wells by pumping with an electric submersible pump to remove sediment disturbed drilling and well installation. Approximately 40 gallons of water was removed from each well and placed in 55-gallon drums for disposal.

4.0 GROUNDWATER MONITORING

4.1 Depth to Groundwater and Groundwater Potentiometric Surface Elevation

On July 29, 2021, LAI personnel gauged monitoring wells MW-1, MW-2, MW-3, and MW-4 for depth to groundwater. Groundwater was gauged at 57.40 feet TOC (MW-1), 54.81 feet TOC (MW-2), 53.55 feet TOC (MW-3) and 44.38 feet TOC (MW-4). On July 29, 2021, the groundwater potentiometric surface elevation ranged from 3,370.64 feet above mean sea level (MSL) at MW-4 (EBDU #830) to 3,355.77 feet above MSL at MW-3 (EBDU #929). The apparent groundwater flow direction was from west to east at a gradient of approximately 0.010 feet per foot (ft/ft). Figure 4a presents the groundwater potentiometric surface map for July 29, 2021.

On November 8, 2021, LAI personnel gauged monitoring wells MW-1, MW-2, MW-3, and MW-4 for depth to groundwater. Groundwater was gauged at 3,359.98 feet TOC (MW-1), 3,356.75 feet TOC (MW-2), 3,355.49 feet TOC (MW-3) and 3,371.58 feet TOC (MW-4). The groundwater potentiometric surface elevation ranged from 3,371.58 feet 68.22 above MSL at MW-4 (EBDU #830) to 3,355.49 feet above MSL at MW-2 (EBDU #929). The apparent groundwater flow direction is from west to east a gradient of approximately 0.010 ft/ft. Figure 4b presents the groundwater potentiometric surface map for November 8, 2021.

4.2 Groundwater Samples and Analysis

Groundwater samples were collected from the monitoring wells (MW-1, MW-2, MW-3, and MW-4), during quarterly sampling events on July 29-30, 2021 (Q/3), and November 8, 2021 (Q/4). LAI personnel used the low stress or low flow method following EPA protocol (EQASOP-GW4, Revision 4, September 19,

2017) to collect groundwater samples. A stainless-steel environmental pump was lowered into the well near the middle of the water column and the well was pumped at a low rate until environmental parameters stabilized. Groundwater samples were collected in labeled laboratory containers from the of the dedicated Tygon® tubing after chemical parameters stabilized. The Tygon® tubing was discarded after each use and the pump was thoroughly cleaned with a solution of potable water and laboratory grade detergent (Alconox®) and rinsed with distilled water. The samples were transferred to, packed with ice in an ice chest, and delivered under chain of custody control to Eurofins Xenco Laboratory (Xenco), a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory, in Midland, Texas. Duplicate samples were collected from wells MW-2 and MW-4 for laboratory quality assurance and quality control (QA/QC). Xenco analyzed the samples for benzene, toluene, ethylbenzene, xylene (BTEX) according to EPA SW-846 Method SW-8260D, chloride by EPA Method 300, and total dissolved solids (TDS) by EPA Method SM 2540C. Table 2 presents the laboratory analytical summary. Appendix C presents the laboratory reports.

4.2.1 Organic Analysis

Total BTEX concentrations were below the laboratory analytical reporting limit (RL) and New Mexico Water Quality Control Commission (WQCC) human health standards in groundwater samples collected from monitoring wells MW-1, MW-3, and MW-4, on July 29 - 30, 2021. The laboratory reported benzene above the WQCC human health standard of 0.005 milligrams per liter (mg/L) in the sample from monitoring well MW-2 (0.0391 mg/L) on July 29 - 30, 2021. Monitoring well MW-2 is located hydraulically downgradient from the pit at EBDU #922.

Total BTEX concentrations were below the laboratory analytical reporting limit (RL) and New Mexico Water Quality Control Commission (WQCC) human health standards in all groundwater samples collected from monitoring wells MW-1, MW-2, MW-3, and MW-4, on November 8, 2021.

4.2.2 Inorganic Analysis

4.2.2.1 Chloride

On July 29 – 30, 2021, chloride was reported below the WQCC domestic water quality standard (250 mg/L) in the sample from monitoring well MW-3 (128 mg/L). Chloride was reported above the WQCC domestic water quality standard in samples from monitoring wells MW-1 (446 mg/L), MW-2 (268 mg/L), and MW-4 (559 mg/L). The chloride concentration in the duplicate (QA/QC) sample collected from MW-2 (Dup-1) was 244 mg/L and within 1.1 percent of the original chloride value (268 mg/L) for MW-2. The chloride concentration in the duplicate (QA/QC) sample (Dup-2) collected from MW-4 was 235 mg/L and within 2.4 percent of the original chloride value (559 mg/L) for MW-2. Figure 5a presents the chloride concentrations in groundwater samples from July 29 - 30, 2021.

On November 8, 2021, chloride was reported below the WQCC domestic water quality standard (250 mg/L) in samples from monitoring well MW-3 (114 mg/L) and MW-4 (182 mg/L). Chloride was reported above the WQCC domestic water quality standard in samples from monitoring wells MW-1 (1,250 mg/L) and MW-2 (253 mg/L). The chloride concentration in the duplicate (QA/QC) sample (Dup-1) collected from MW-2 was 270 mg/L and within 3.28 percent of the original chloride value (279 mg/L) for MW-2. Figure 5b presents the chloride concentrations in groundwater map for November 8, 2021.

4.2.2.2 TDS

On July 29 – 30, 2021, the laboratory reported TDS concentrations of 2,510 mg/L (MW-1), 1,170 mg/L (MW-2), 663 mg/L (MW-3) and 1,030 mg/L (MW-4). The TDS concentrations except MW-3 were above the WQCC domestic water quality standard (1,000 mg/L) The TDS concentration from monitoring well MW-3 (663 mg/L), was below the WQCC domestic water quality standard (1,000 mg/L). The TDS concentration in the duplicate samples were 1,160 mg/L (Dup-1) and 1,130 mg/L (DUP-2) from MW-2 and MW-4, respectively, were consistent with original TDS values for MW-2 (1,170 mg/L) and MW-4 (1,130 mg/L). The TDS concentration in the duplicate sample from MW-2 (Dup-1) was 1,160 mg/L and within 1.0 percent of the original chloride value (1,170 mg/L) for MW-2. Figure 6a presents the TDS concentrations in groundwater map for July 29-30, 2021.

On November 8, 2022, TDS concentrations were below the WQCC domestic water quality standard of 1,000 mg/L in groundwater samples from MW-3 (644 mg/L) and MW-4 (832 mg/L). The TDS concentrations for monitoring wells MW-1 and MW-2 were above the WQCC domestic water quality standard (1,000 mg/L) at 2,490 and 1,100 mg/L respectively. The TDS concentration in the duplicate (QA/QC) sample Dup-1 (1,100 mg/L) from MW-2 was consistent with original TDS values for MW-2 (1,100 mg/L). The TDS concentration in the duplicate (QA/QC) sample (Dup-1) collected from MW-2 was 1,100 mg/L and within 1.0 percent of the original chloride value (1,100 mg/L) for MW-2. Figure 6b presents the TDS concentrations in groundwater map for November 8, 2021.

5.0 CONCLUSIONS

The following observations are documented in this report:

- The apparent groundwater flow direction was from west to east at a gradient of approximately 0.01 ft/ft, on July 29 - 30, 2021, and November 8, 2021.
- BTEX concentrations were below the analytical method RL and New Mexico WQCC human health standards in groundwater samples from monitoring wells MW-1, MW-3, and MW-4 on July 29-30, 2021.
- The benzene concentration in the sample from monitoring well MW-2 (0.0391 mg/L) was above the WQCC human health standard of 0.005 mg/L, on July 29, 2021.
- BTEX concentration were below the RL and WQCC human health standards in all wells on November 8, 2021.
- The chloride concentration in the samples from monitoring wells MW-1 (446 mg/L), MW-2 (268 mg/L), and MW-4 (559 mg/L) was above the WQCC domestic water quality standard of 250 mg/L, on July 29-30, 2021.
- The chloride concentration in the sample from monitoring well MW-3 (128 mg/L) was below the WQCC domestic water quality standard of 250 mg/L, on July 29 - 30, 2021.
- The TDS concentration was below the WQCC domestic water quality standard of 1000 mg/L in groundwater samples from monitoring well MW-3 (663 mg/L), on July 29 - 30, 2021, and in samples from monitoring wells MW-3 (644 mg/L) and MW-4 (832 mg/K) on November 8, 2021.
- TDS concentrations in the groundwater samples from wells MW-1 (2,510 mg/L), MW-2 (1,170 mg/L), and MW-4 (1,030 mg/L) were above the WQCC domestic water quality standard (1,000 mg/L) on July 29 – 30, 2021.

- TDS concentrations in the groundwater samples from wells MW-1 (2,490 mg/L) and MW-2 (1,100 mg/L) were above the WQCC domestic water quality standard (1,000 mg/L) on November 8, 2021.

6.0 RECOMMENDATIONS

Apache proposes the following:

- Continue groundwater monitoring on a quarterly (4 times per year).
- Gauge each well (MW-1 through MW-4) for depth to groundwater and collect groundwater samples from monitoring wells with sufficient groundwater during each quarterly event.
- Report the laboratory results to NMOCD in quarterly reports, unless significant changes in analyte concentrations are detected, at which time Apache will immediately report the results to NMOCD.
- Apache will provide notice to the NMOCD in Hobbs and Santa Fe, New Mexico, at least 7 working days prior to each monitoring event.

Tables

Table 1
1RP-313
Monitoring Well Completion and Gauging Summary
Apache Corportaion, NEDU Drill Pits
Lea County, New Mexico

Well Information									Groundwater Data				
Well No.	Date Drilled	Well Depth (Feet TOC)	Drilled Depth (Feet BGS)	Well Diameter (Inches)	Surface Elevation (Feet AMSL)	Screen Interval (Feet BGS)	Casing Stickup (Feet)	TOC Elevation (Feet AMSL)	Date Gauged	Depth to Water (Feet TOC)	Depth to Water (Feet BGS)	Water Column Height (Feet)	Groundwater Elevation (Feet AMSL)
MW-1	07/19/2021	74.08	71.08	2	3417.34	70.85-50.85	3.00	3,417.34	07/29/2021	57.40	54.40	16.68	3,359.94
									11/08/2021	57.40	54.40	16.68	3,359.94
									03/02/2022	57.36	54.36	16.72	3,359.98
MW-2	07/19/2021	74.86	71.86	2	3408.43	71.68-51.68	3.00	3,411.66	07/29/2021	54.81	51.81	20.05	3,356.85
									11/08/2021	54.85	51.85	20.01	3,356.81
									03/02/2022	54.91	51.91	19.95	3,356.75
MW-3	07/20/2021	65.35	62.75	2	3406.01	65.15-45.15	2.60	3,409.32	07/29/2021	53.55	50.95	11.80	3,355.77
									11/08/2021	53.67	51.07	9.68	3,357.99
									03/02/2022	53.83	51.23	11.52	3,355.49
MW-4	07/20/2021	76.01	72.93	2	3412.51	75.81-55.81	3.08	3,415.02	07/30/2021	44.38	41.30	31.63	3,370.64
									11/08/2021	43.44	40.36	32.57	3,368.22
									03/02/2022	43.44	40.36	32.57	3,371.58

Notes: monitoring wells installed by Environ-Drill, Albuquerque, New Mexico with 2 inch schedule 40 PVC casing and screen
bgs: below ground surface
TOC: top of casing
AMSL: denotes elevation in feet above mean sea level

Table 2
Groundwater Sample Analytical Data Summary
Apache Corporation, NEDU #830, 922, 928, and 929
Lea County, New Mexico

Sample	Collection Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)	TDS (mg/L)
NMWQCC Standard:		*0.005	* 1	*0.7	*0.62	**250	**1,000
MW-1 (NEDU #830)	7/29/2021	<0.00200	<0.00200	<0.00200	<0.00400	446	2,510
	11/8/2021	<0.00200	<0.00200	<0.00200	<0.00400	1,270	2,490
	3/2/2022	<0.00200	<0.00200	<0.00200	<0.00400	1,250	2,500
MW-2 (NEDU #922)	7/29/2021	0.0391	<0.00200	<0.00219	<0.00400	268	1,170
	11/8/2021	<0.00200	<0.00200	<0.00200	<0.00400	279	1,100
	3/2/2022	M0.00200	M0.00200	M0.00200	M0.00400	253	1,110
MW-3 (NEDU #929)	7/29/2021	0.00407	<0.00200	<0.00200	<0.00400	128	663
	11/8/2021	<0.00200	<0.00200	<0.00200	<0.00400	122	644
	3/2/2022	<0.00200	<0.00200	<0.00200	<0.00400	114	664
MW-4 (NEDU #928)	7/30/2021	<0.00200	<0.00200	<0.00200	<0.00400	559	1,030
	11/8/2021	<0.00200	<0.00200	<0.00200	<0.00400	203	832
	3/2/2022	<0.00200	<0.00200	<0.00200	<0.00400	182	836
Dup-1 (MW-2)	7/29/2021	<0.00200	<0.00200	<0.00200	<0.00400	244	1,160
	11/8/2021	<0.00200	<0.00200	<0.00200	<0.00400	270	1,100
	3/2/2022	<0.00200	<0.00200	<0.00200	<0.00400	268	1,090
Dup-2 (MW-4)	7/30/2021	<0.00200	<0.00200	<0.00200	<0.00400	235	1,030

Notes:
analysis performed by Xenco Laboratories, Midland, Texas by EPA SW-846 Method 8021B (BTEX) and Method 300 (chloride)
All values reported in milligrams per liter (mg/L) equivalent to parts per million (ppm)
< values - denotes concentration is less than method reporting limit (RL).
* - NMWQCC human health standard
** - NMWQCC domestic water quality standard
BGS - below ground surface

Figures

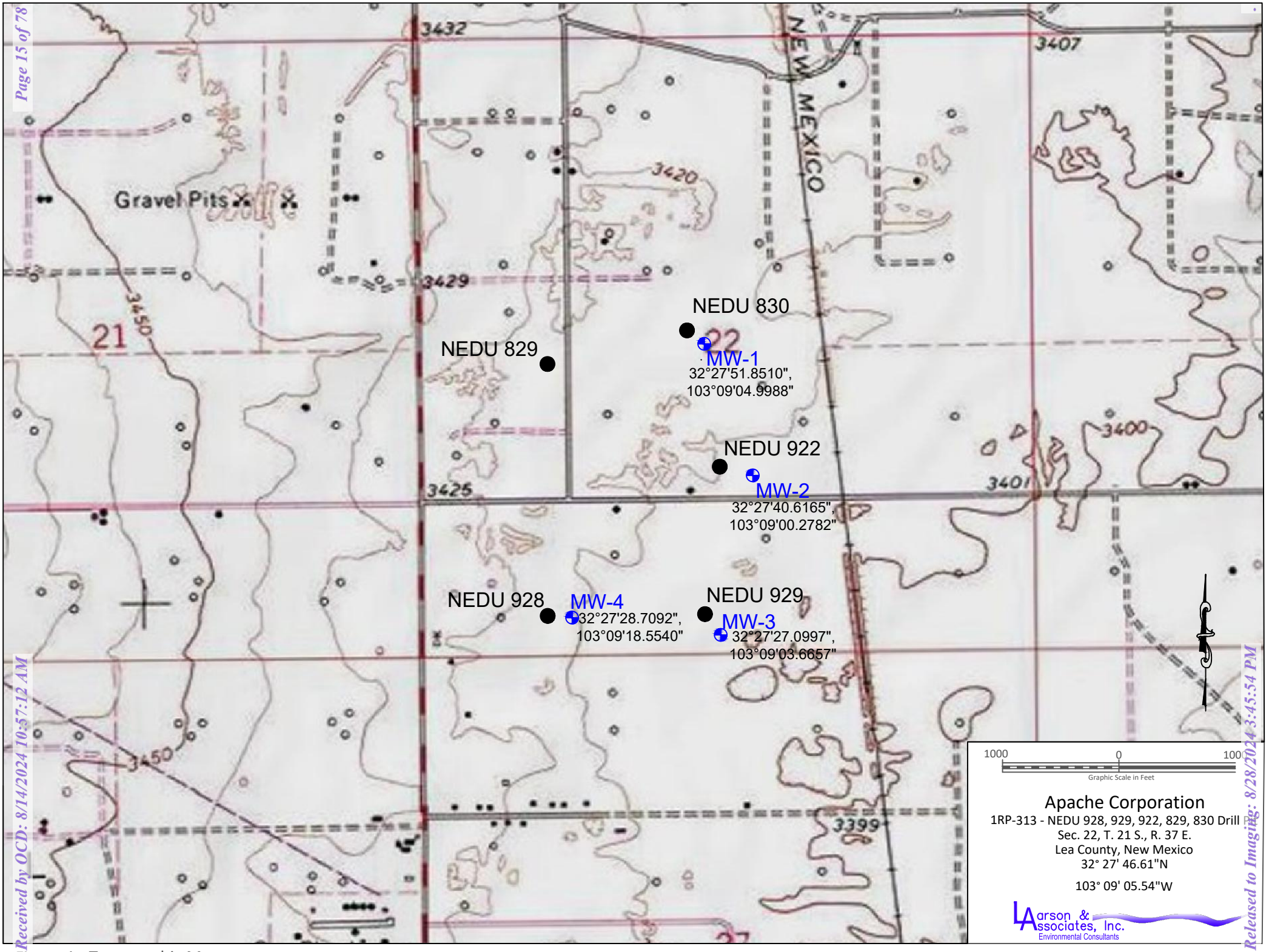


Figure 1 - Topographic Map

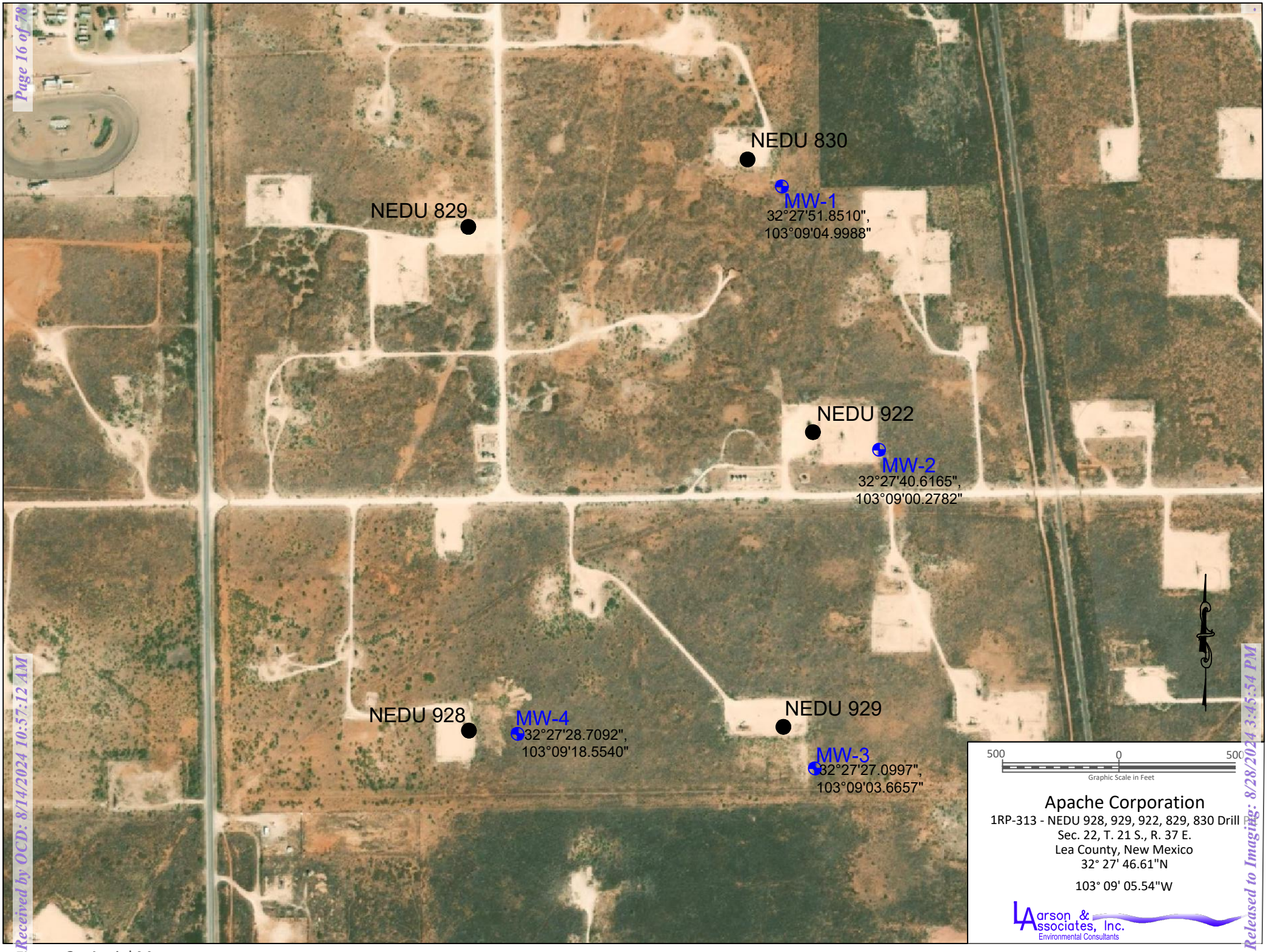


Figure 2 - Aerial Map

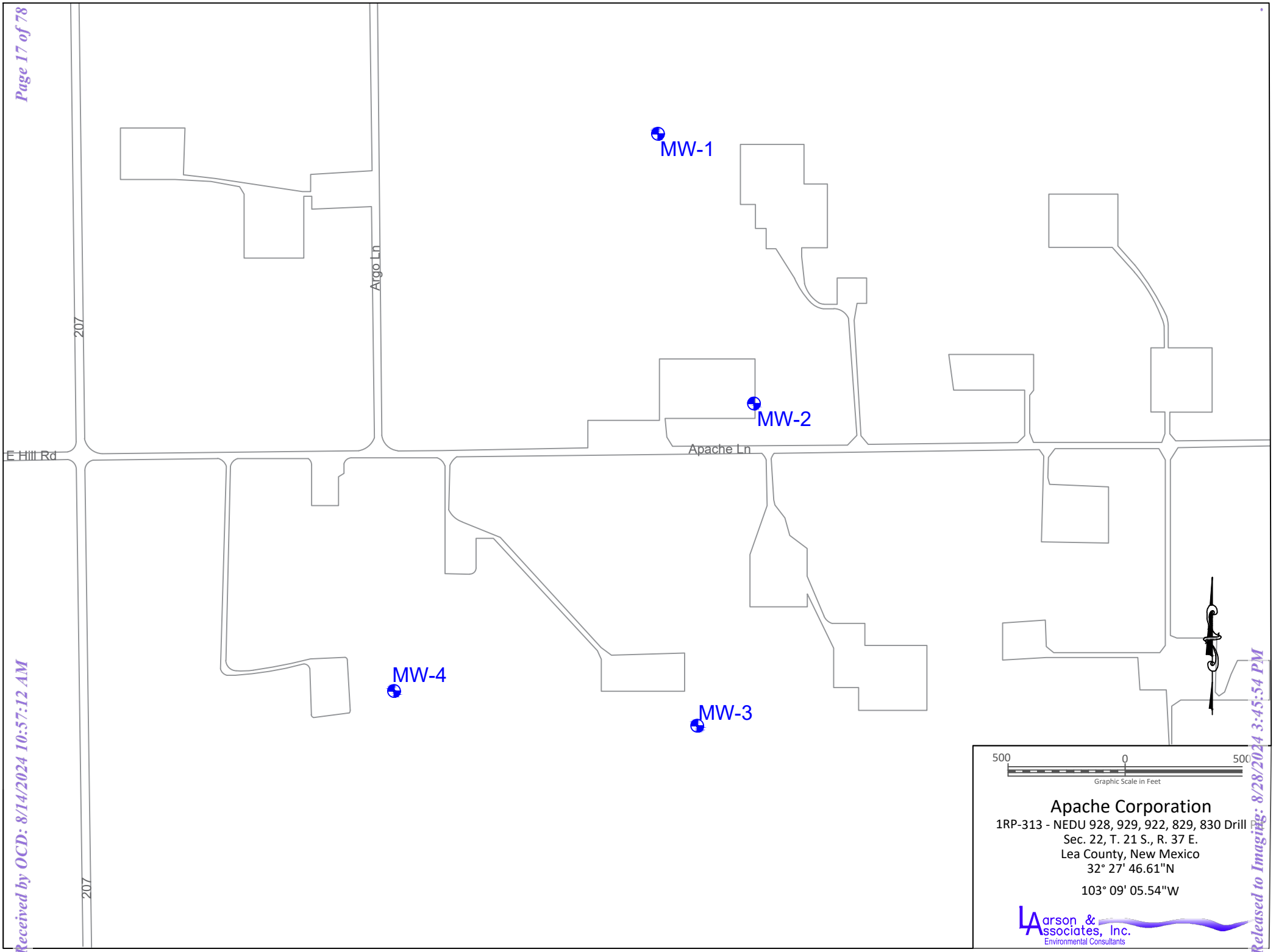


Figure 3 - Site Map

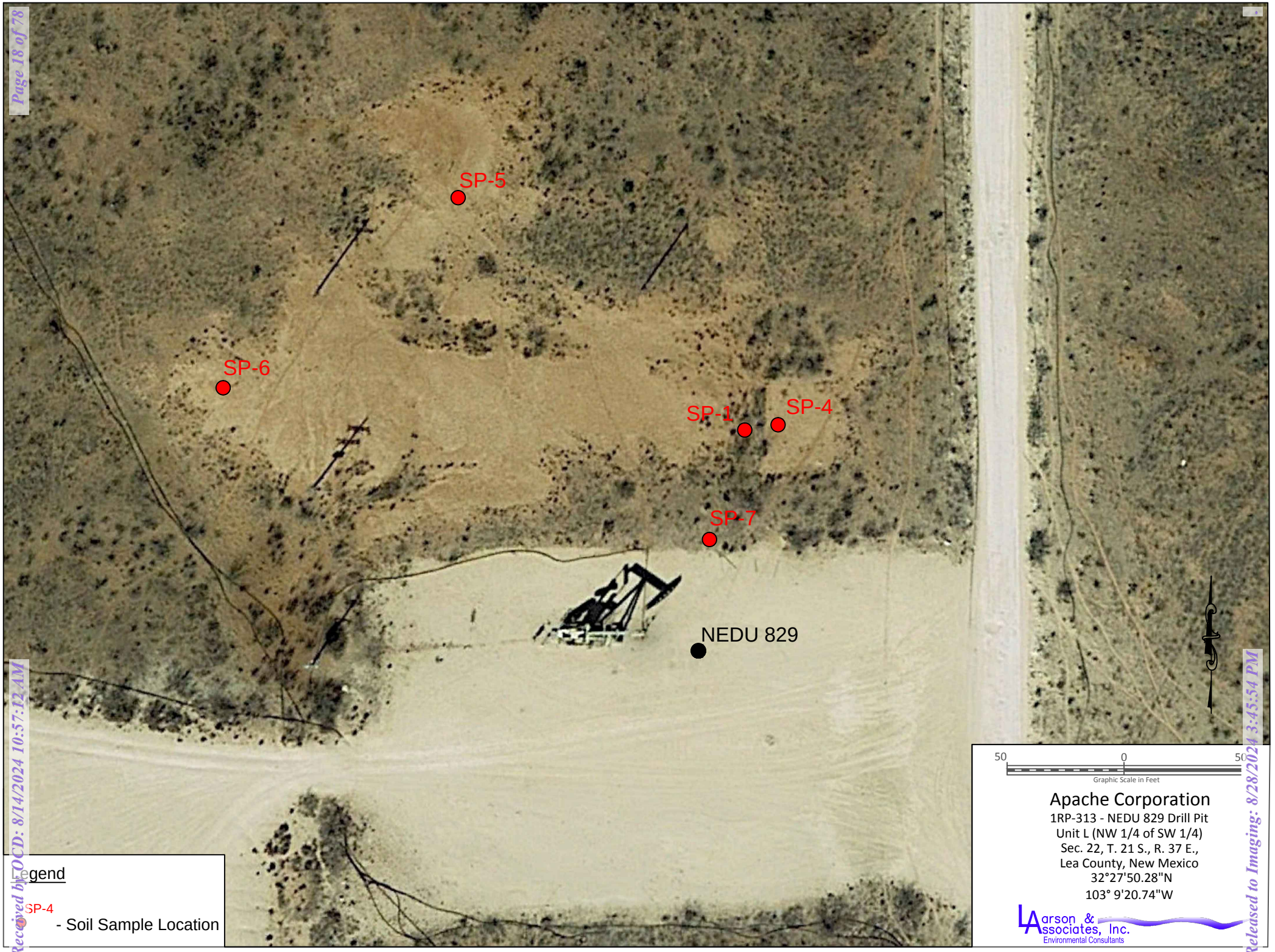


Figure 3a - Aerial Map Showing NEDU 829

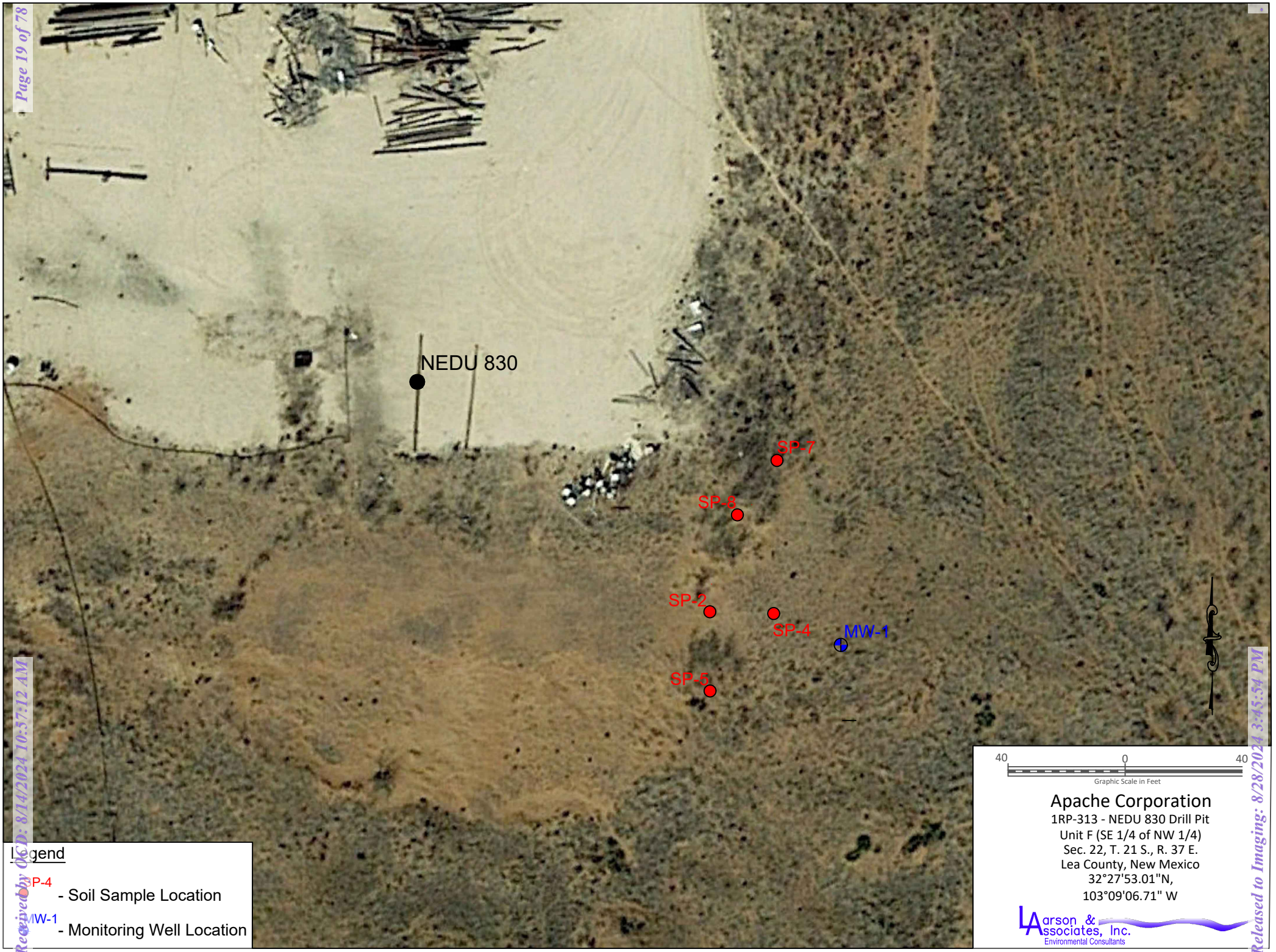


Figure 3b - Aerial Map Showing NEDU 830

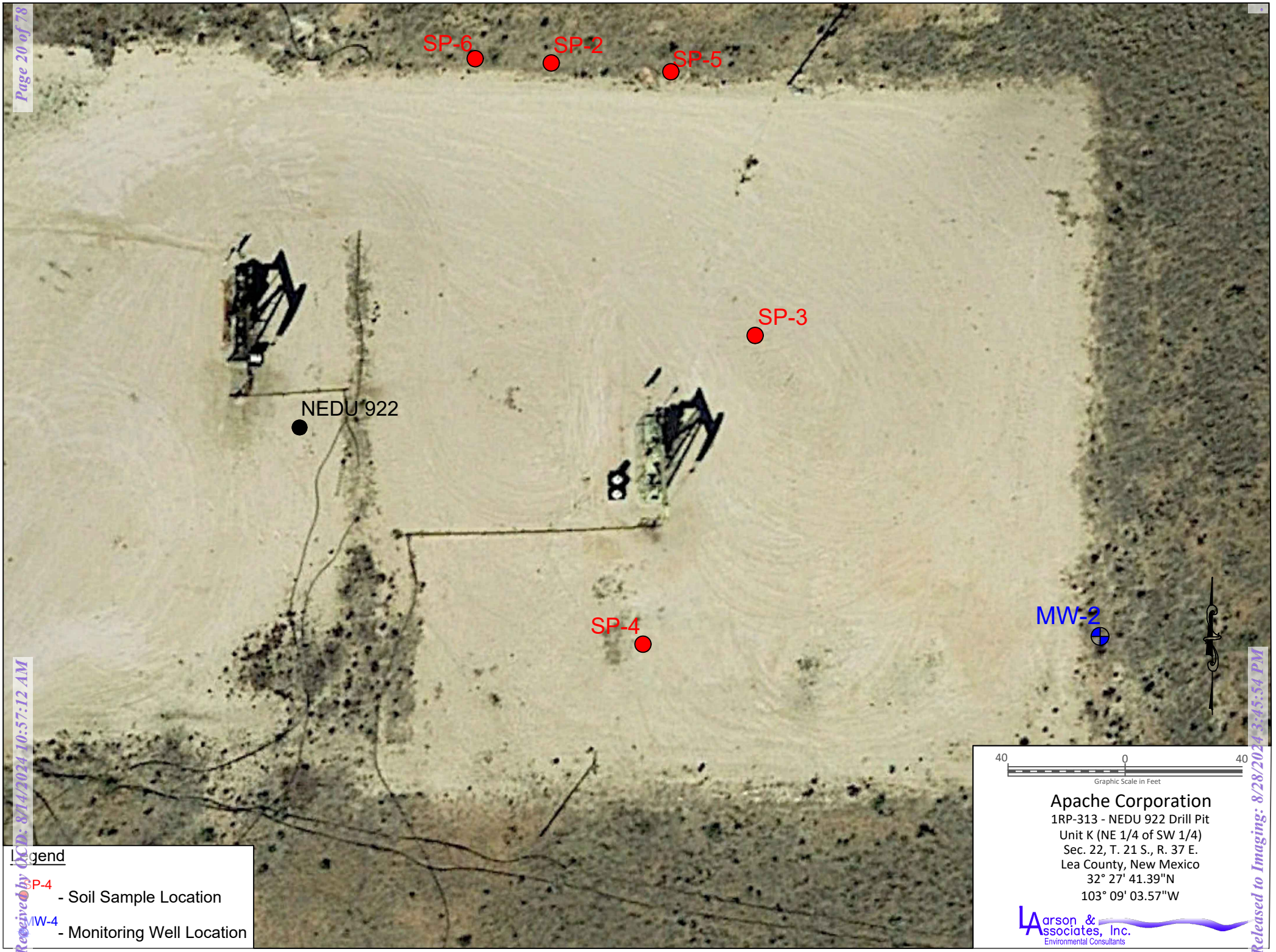


Figure 3c - Aerial Map Showing NEDU 922

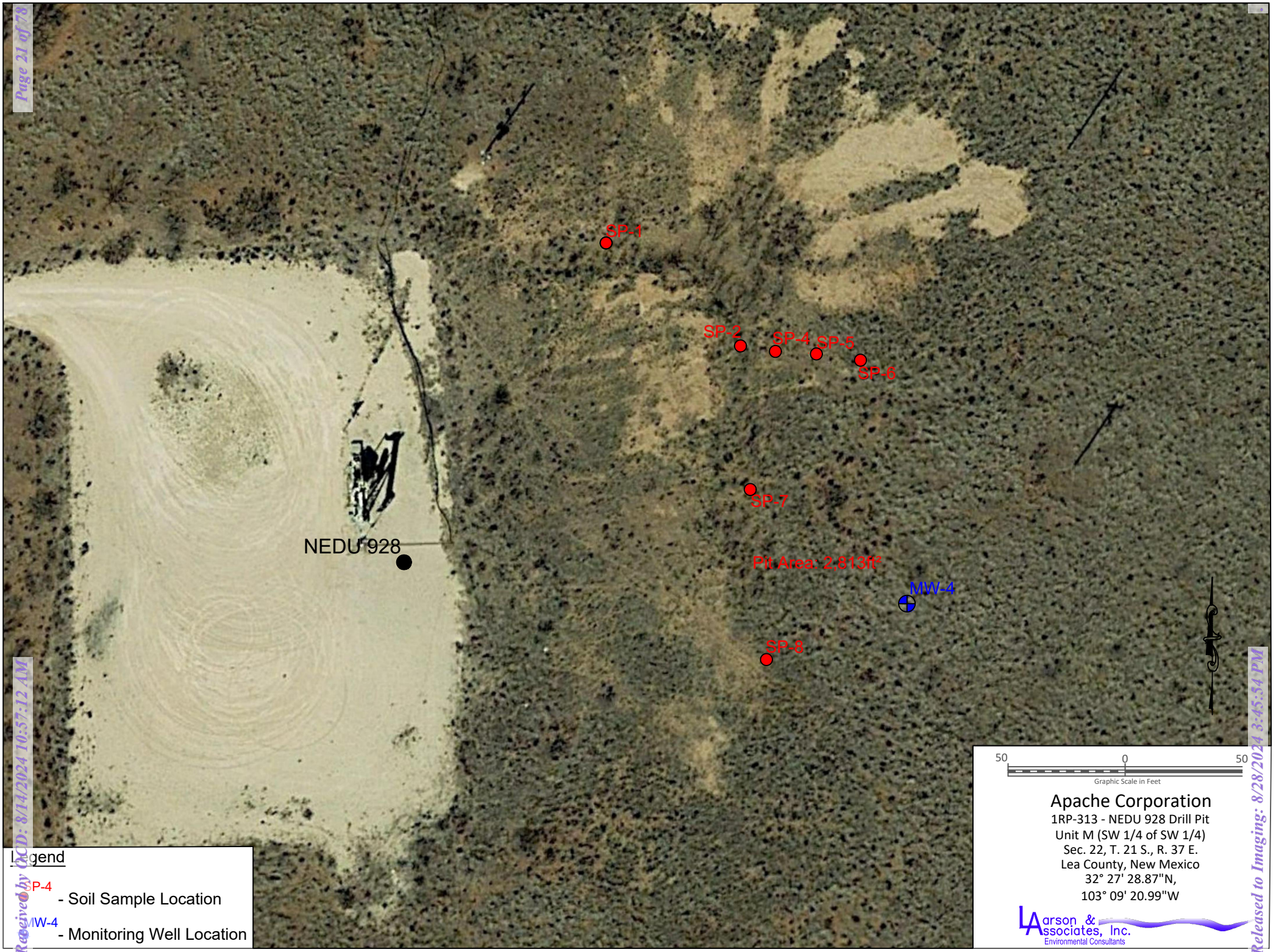


Figure 3d - Aerial Map Showing NEDU 928

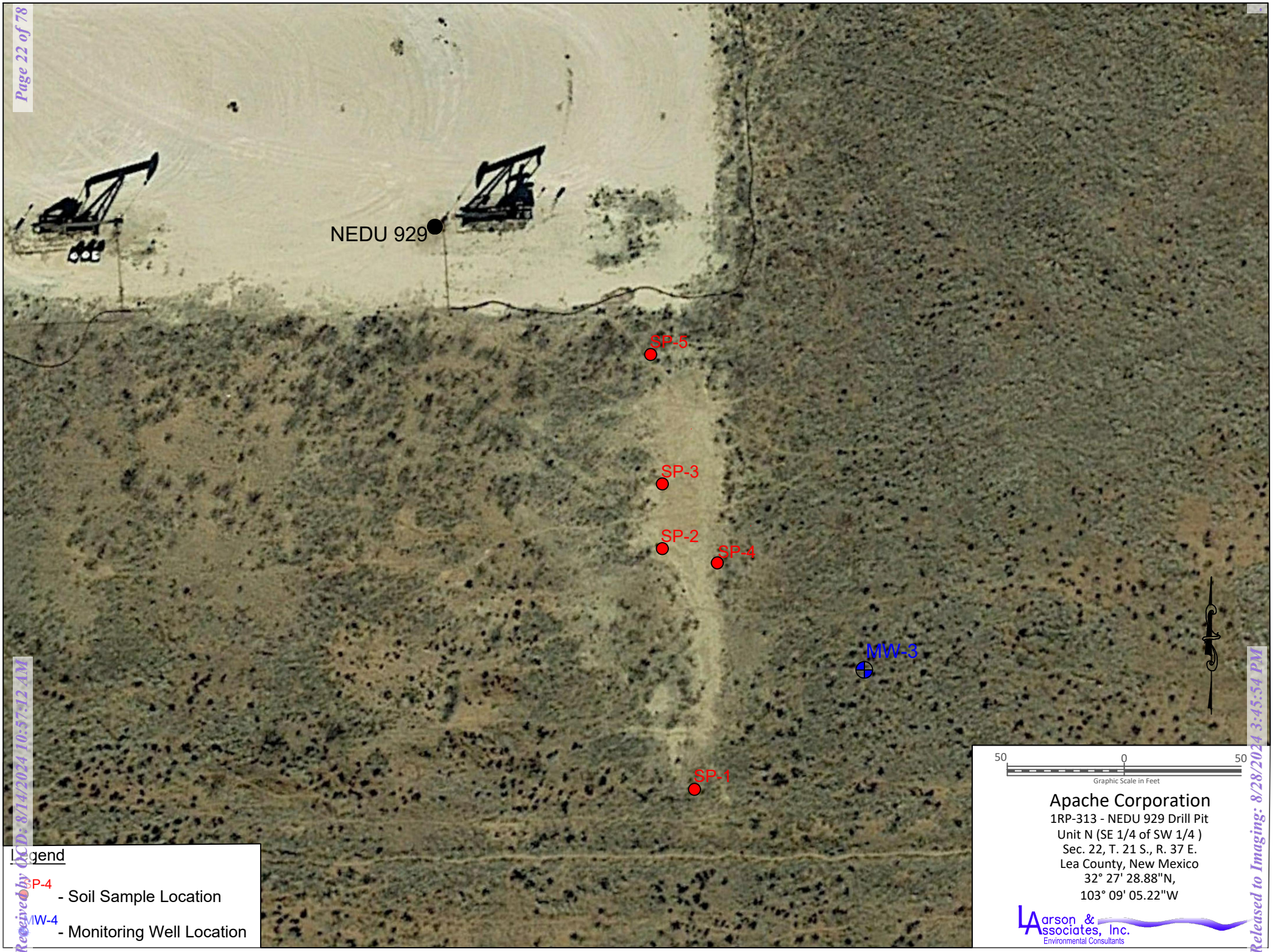


Figure 3e - Aerial Map Showing NEDU 929

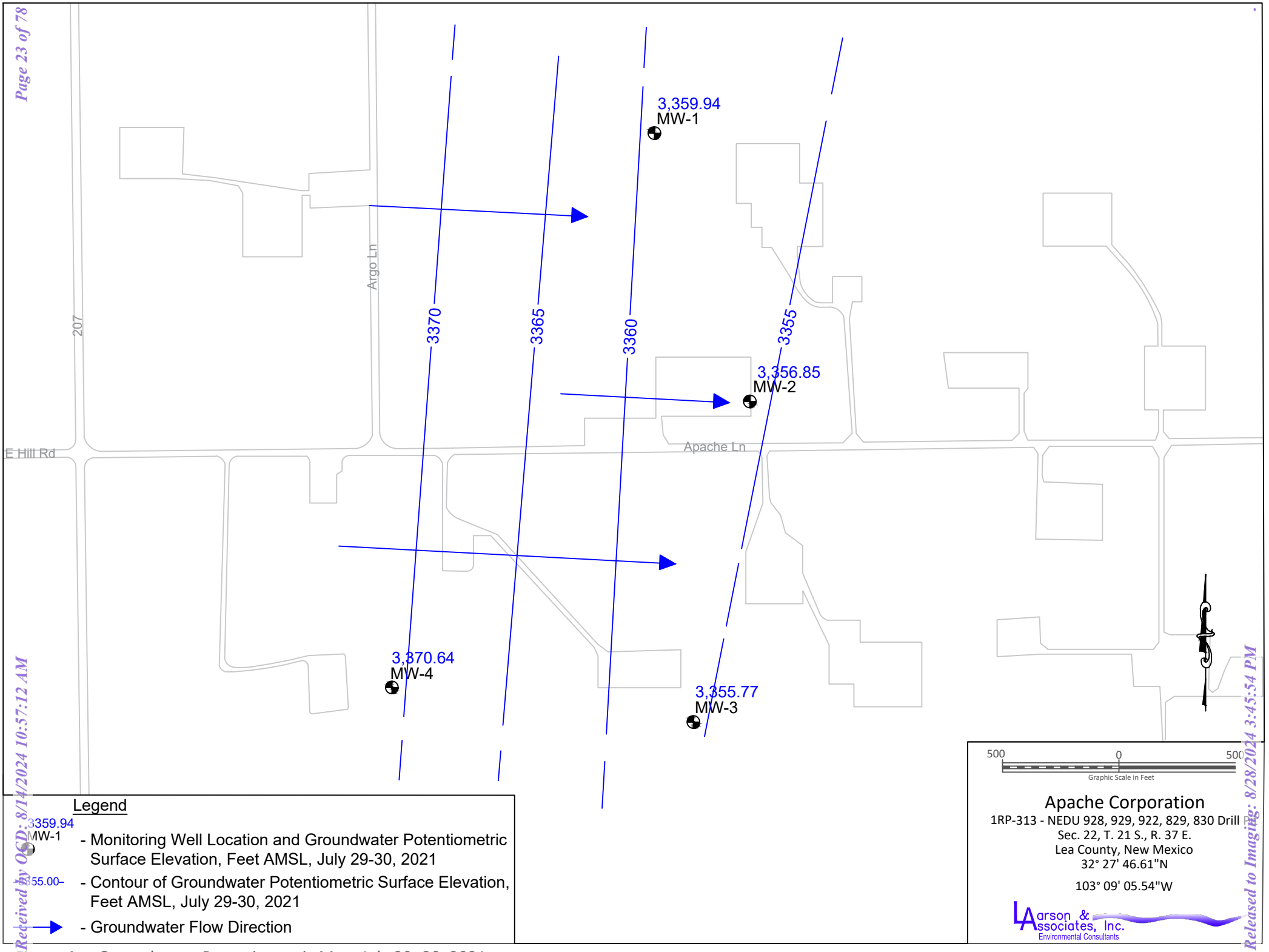


Figure 4a - Groundwater Potentiometric Map, July 29 -30, 2021

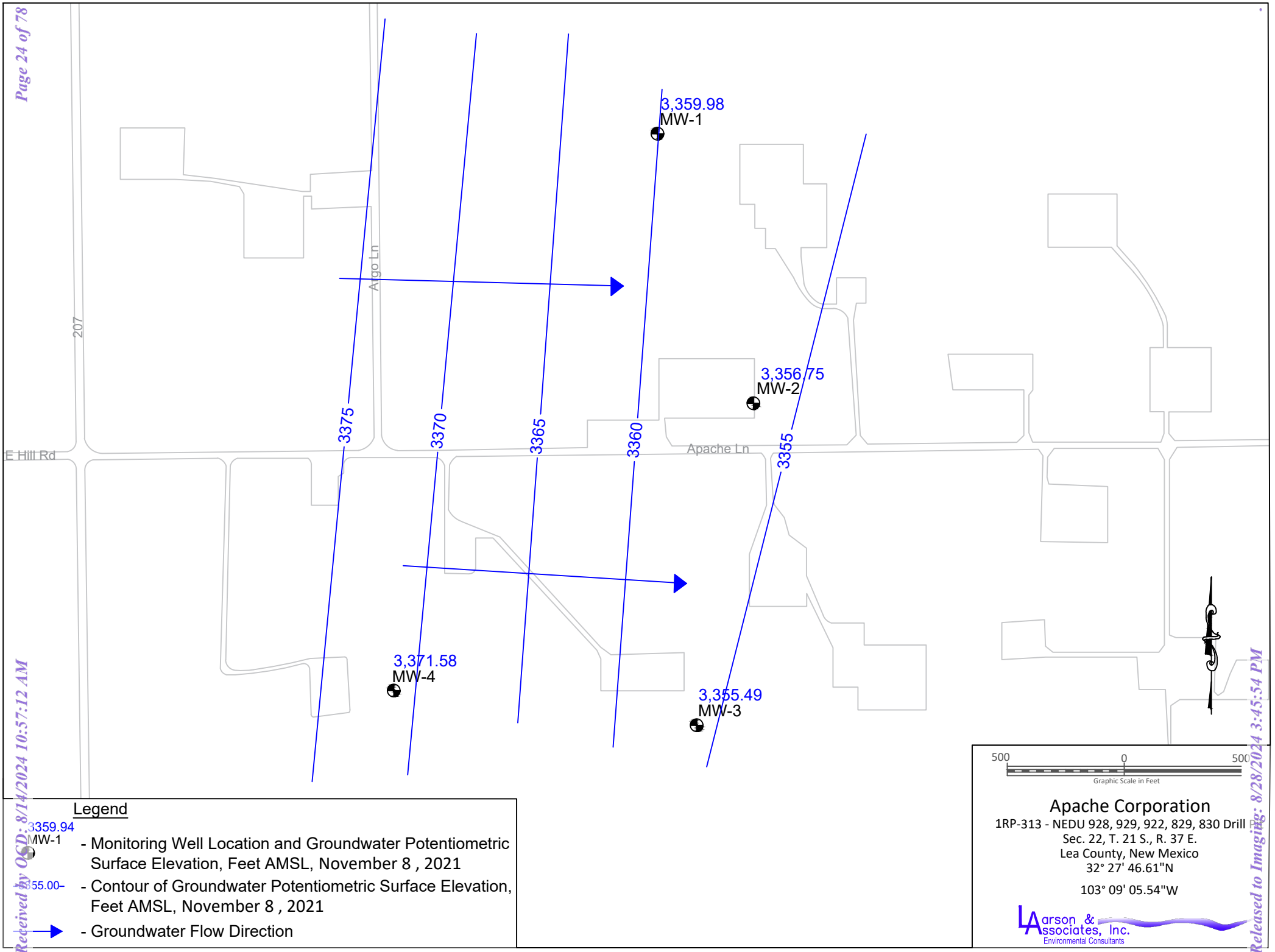


Figure 4b - Groundwater Potentiometric Map, November 8 , 2021

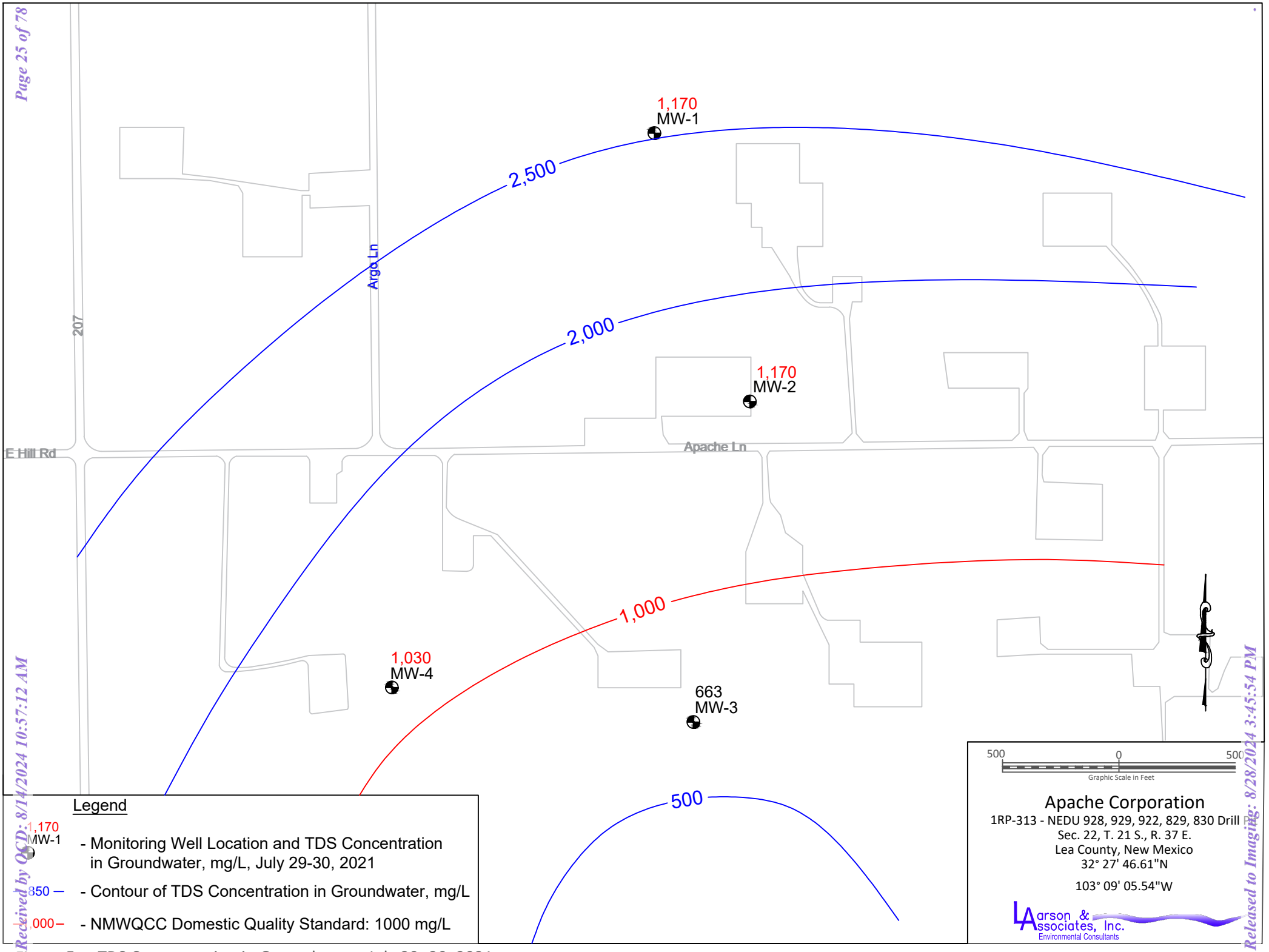


Figure 5a - TDS Concentration in Groundwater, July 29 -30, 2021

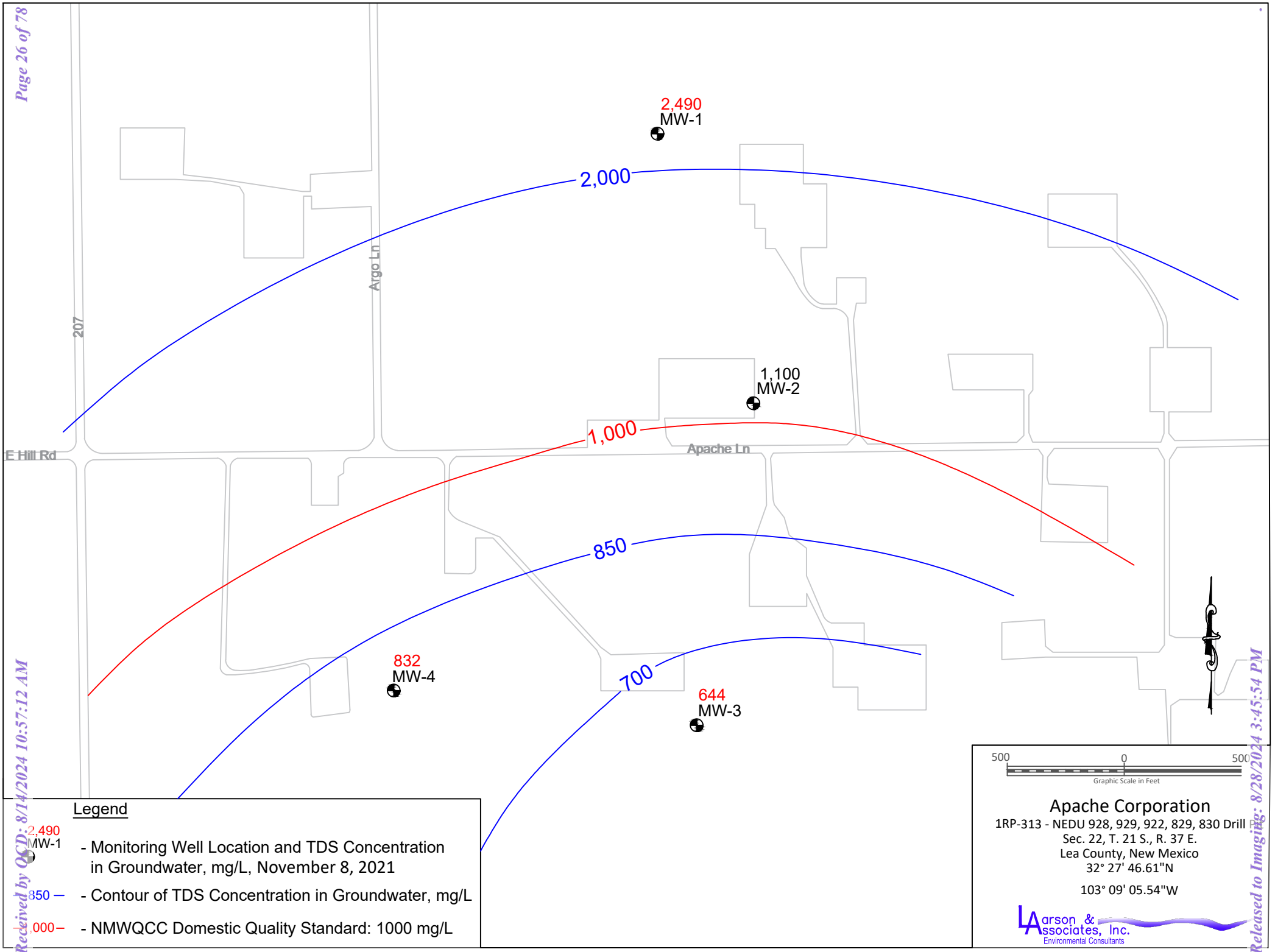


Figure 5b - TDS Concentration in Groundwater, November 8, 2021

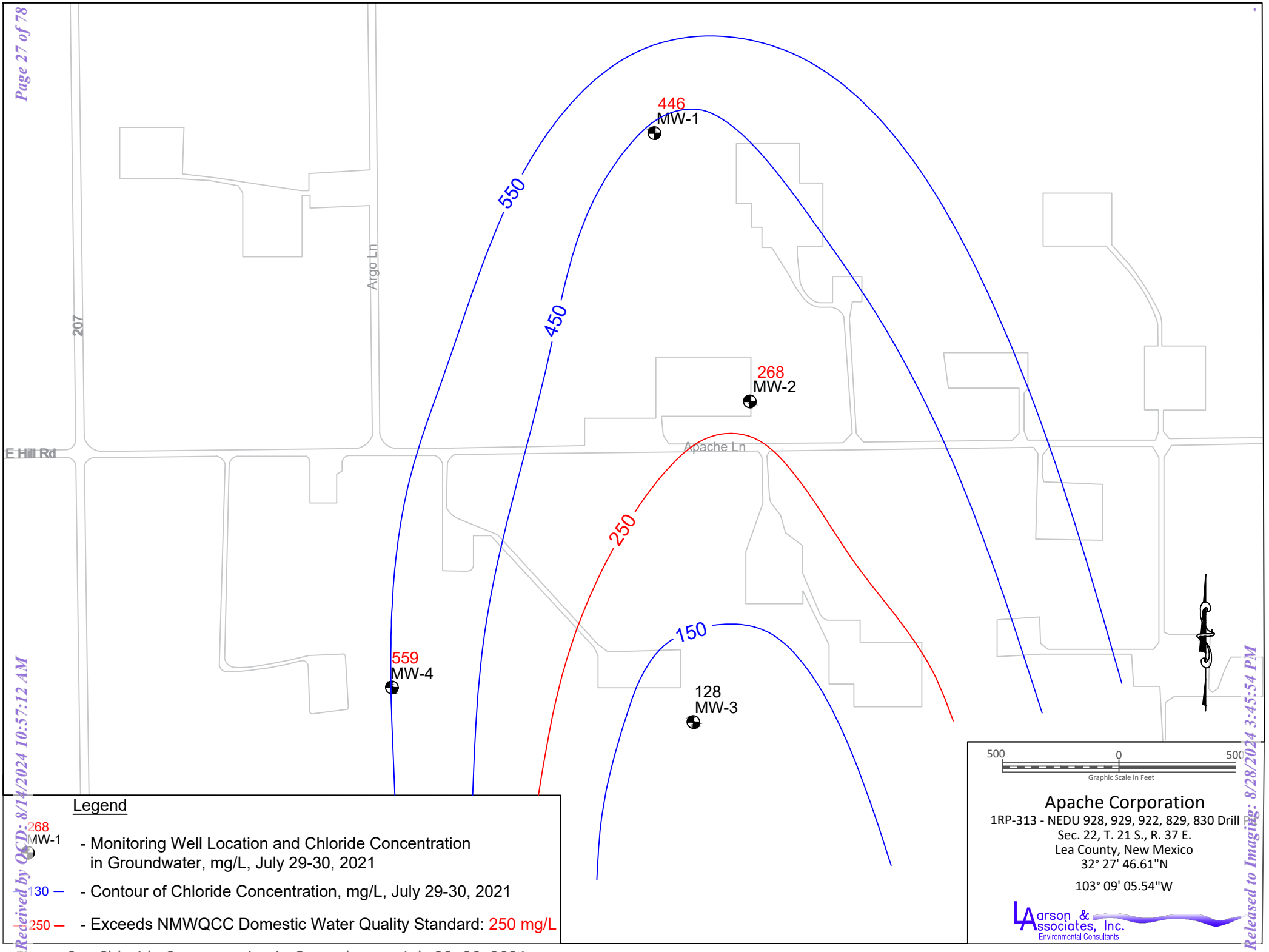


Figure 6a - Chloride Concentration in Groundwater, July 29 -30, 2021

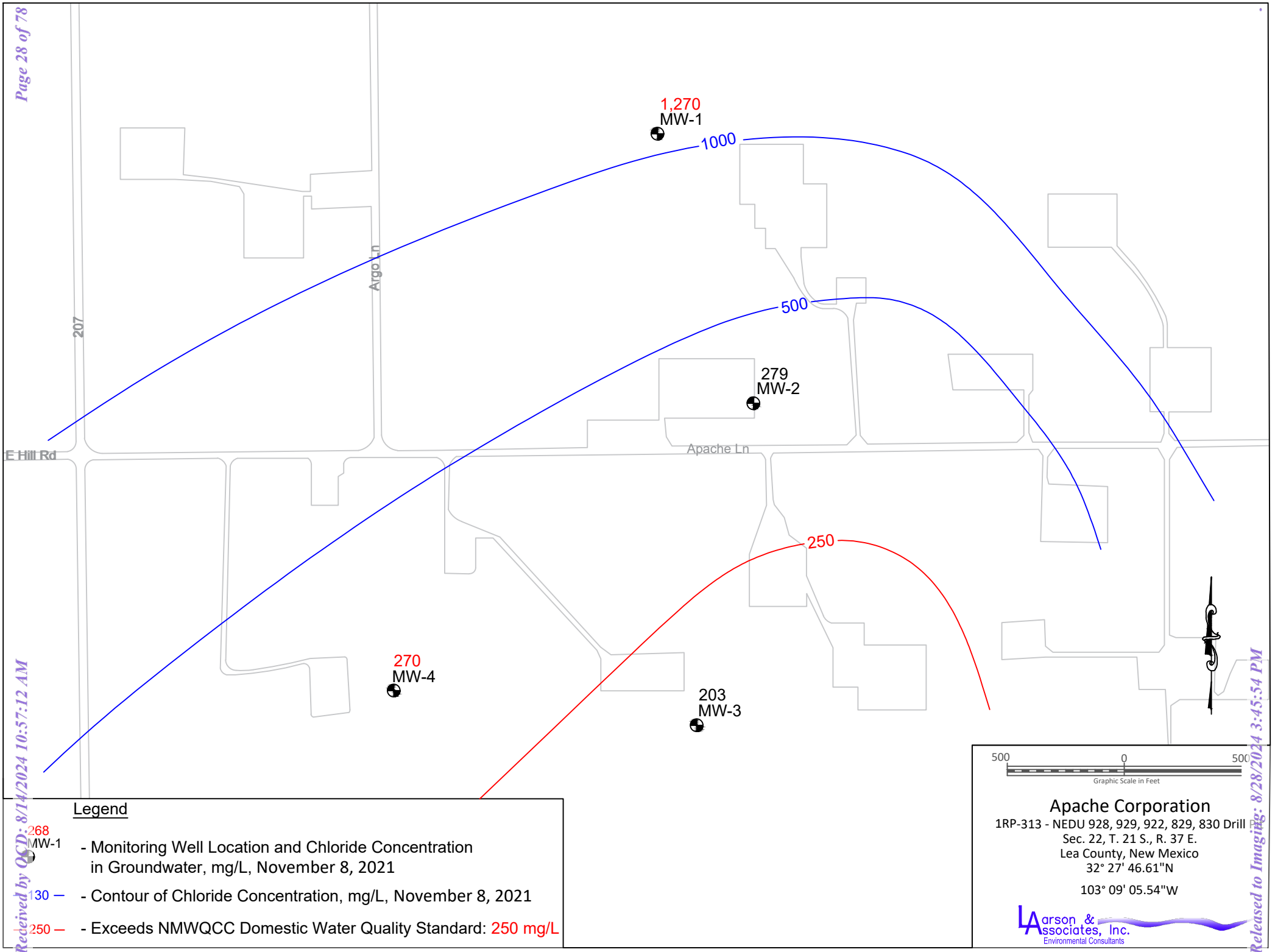


Figure 6b - Chloride Concentration in Groundwater, November 8, 2021

Appendix A

NMOCD Communications

From: Baker, Larry
To: Robert Nelson
Subject: FW: [EXTERNAL] The Oil Conservation Division (OCD) has approved the application, Application ID: 10932
Date: Tuesday, July 13, 2021 3:24:03 PM

From: OCDOnline@state.nm.us [mailto:OCDOnline@state.nm.us]
Sent: Thursday, May 13, 2021 3:00 PM
To: Baker, Larry <Larry.Baker@apachecorp.com>
Subject: [EXTERNAL] The Oil Conservation Division (OCD) has approved the application, Application ID: 10932

To whom it may concern (c/o Larry Baker for APACHE CORPORATION),

The OCD has approved the submitted *Application for administrative approval of a release notification and corrective action* (C-141), for incident ID (n#) nRM2031146817, with the following conditions:

- **Using new Rule make sure sidewall data and bottom data are correct. Requested variances for excavation and liner are approved. Get pre-approval for Monitor Well locations on map before installations.**

The signed C-141 can be found in the OCD Online: Imaging under the incident ID (n#).

If you have any questions regarding this application, please contact me.

Thank you,
Bradford Billings
Hydrologist/E.Spec.A
505-670-6549
bradford.billings@state.nm.us

New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive
Santa Fe, NM 87505

From: Billings, Bradford, EMNRD
To: Robert Nelson
Cc: Mark Larson; Baker, Larry
Subject: RE: Apache Corp. (1RP-0313/nRM2031146817) Monitor Well Location Approval
Date: Wednesday, July 14, 2021 12:13:08 PM
Attachments: image001.png

07/14/2021

Hello,

Locations as indicated in attached PDF's are APPROVED. Question, one might consider some soil samples for same analytes, at least in the vicinity of anticipated/encountered groundwater.
Thank you for your efforts.

Sincerely,

Bradford Billings
EMNRD/OCD

From: Robert Nelson <rnelson@laenvironmental.com>
Sent: Wednesday, July 14, 2021 7:12 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Mark Larson <Mark@laenvironmental.com>; Baker, Larry <Larry.Baker@apachecorp.com>
Subject: Apache Corp. (1RP-0313/nRM2031146817) Monitor Well Location Approval

Hello Bradford,

On October 31, 2019, Larson & Associates, Inc. (LAI) submitted a summary of work and path forward for remediation and closure of trenches associated with drillings pits at the Northeast Drinkard Unit (NEDU) Wells 829, 830, 922, 928, & 929 (1RP-0313). The trenches were discovered on April 6, 2001 when a landowner reported the drilling pits were being closed by disposing pit fluid in trenches adjacent to the drilling pits. Apache was notified and submitted the initial C-141 on April 23, 2001. OCD assigned the wells (trenches) remediation permit 1RP-313. On May 13, 2021, Apache received notification from OCD with approval for the submitted application for administrative approval of a release notification and corrective action (C-141), for incident ID (n#) nRM2031146817. OCD stated " **Using new Rule make sure sidewall data and bottom data are correct. Requested variance for excavation and liner are approved. Get pre- approval for Monitor Well locations on map before installations**".

The summary of work and path forward stated that monitor wells be installed approximately 50 feet hydraulically down gradient (east-southeast) from the trenches and complete with 15 feet of 2-inch schedule 40 screen to gauge depth to groundwater and collect groundwater samples for laboratory analysis (BTEX, chloride and total dissolved solids (TDS)). Please find attached the topographic map and proposed monitor well locations. The drilling rig is currently scheduled to complete the

installation of these monitor wells on Tuesday – Thursday (July 20th through July 22nd, 2021). Your approval of these monitor well locations is requested and greatly appreciated. Please feel free to contact Bruce Baker with Apache at (432) 631-6982 or Larry.Baker@apache.com, Mark Larson at (432) 687-0901 or mark@laenvironmental.com or me if you have any questions.

Thank you,

Robert Nelson
Sr. Geologist
Office – 432-687-0901
Cell – 432-664-4804
rnelson@laenvironmental.com

Appendix B

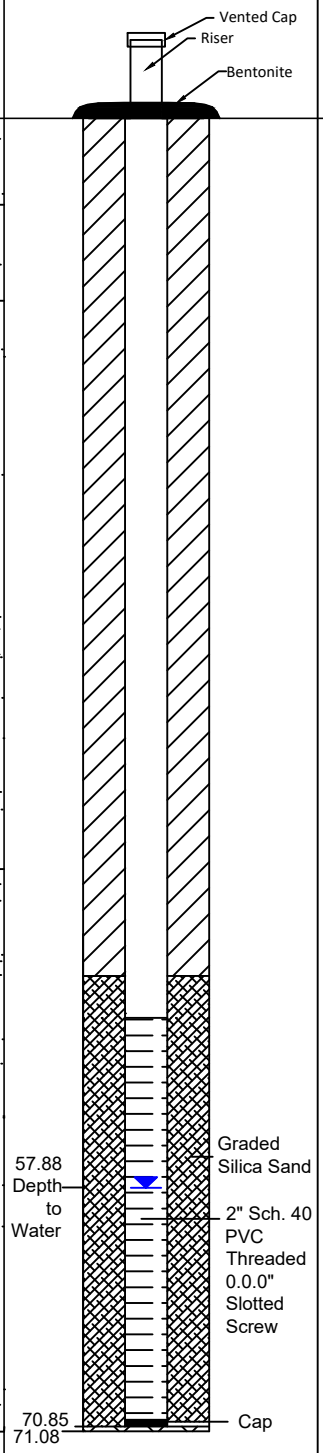
Monitoring Well Completion Records

BORING RECORD

Start: 10:49 MST
Finish: 12:37

Surface Elevation:
TOC Elecation:

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS
	0	Sand, 10YR 5/6, Yellowish Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SW
	5	Silty Sand, 10YR 5/6, Yellowish Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SM
	10	Sand, 7.5YR 7/6, Reddish Yellow, Fine Grained Quartz Sand, Dry, Poorly Sorted	SW
	20		
	25	Sand, 7.5YR 7/6, Reddish Brown, Fine Grained Quartz Sand, Dry, 4.75mm Clasts, Poorly Sorted	
	30		
	35		
	40	Silty Sand, 7.5YR 8/6, Pink, Well Sorted, Fine Grained Quartz Sand, Dry	SM
	45	10 YR 7/6, Yellowish Brown, Fine Grained Quartz Sand, Well Sorted Dry	
	50	10 YR 7/6, Yellowish Brown, Moderately Sorted, 2mm Quartz Clasts, Dry	
57.88 Depth to Water	55	Water Injected at 55'	
	60		
	65		
	70		
		TD: 71.08'	
	75		



NUMBER	RECOVERY	DEPTH	REMARKS
			BACKGROUND PID READING SOIL : _____ PPM SOIL : _____ PPM

ONE CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HRS)
WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
PENETROMETER (TONS/ SQ. FT)
NR NO RECOVERY

JOB NUMBER : 19-0112-22/ Apache
HOLE DIAMETER : 5'
LOCATION : NEDU #830
LAI GEOLOGIST : R. Nelson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 07/19/2021

BORING NUMBER : MW-1

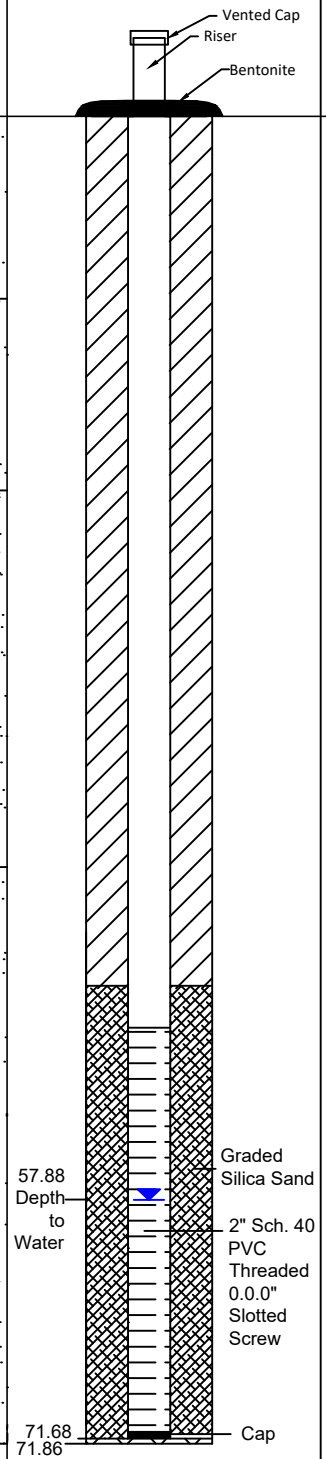
BORING RECORD

Start: 13:17 MST
Finish: 14:40

Surface Elevation:
TOC Elecation:

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS
	0	Sand, 7.5YR 4/6, Strong Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SW
	10	Silty Sand, 7.5YR 7/4, Pink, Fine Grained Quartz Sand, Moderately Sorted, Dry, Quartz Clasts 2mm	SM
	20	7.5YR 6/6, Reddish Yellow, Fine Grained Quartz Sand, Moderately Sorted, Dry, Fine to Medium Quartz Clasts	
	25	Sand, 7.5YR 7/6, Reddish Yellow, Fine Grained Quartz Sand, Dry	SW
	30	7.5YR 7/6, Reddish Yellow, Fine Grained Quartz Sand, Quartz Clasts	
	40	Silty Sand, 7.5YR 5/6, Strong Brown, Fine Grained Quartz Sand, Well Sorted, Dry	SM
	50	7.5YR 5/6, Strong Brown, Fine Grained Quartz Sand, Well Sorted, Dry, Quartz Clasts Medium to Coarse Grained	
57.88 Depth to Water	55	Water Injected at 55'	
	70	TD: 71.86'	

GRAPHIC LOG



NUMBER | RECOVERY | DEPTH

REMARKS

BACKGROUND PID READING
SOIL : PPM
SOIL : PPM

ONE CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HRS)
WATER TABLE (TIME OF BORING)
LABORATORY TEST LOCATION
PENETROMETER (TONS/ SQ. FT)
NR NO RECOVERY

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 07/19/2021

BORING NUMBER : MW-2

JOB NUMBER : 19-0112-22/ Apache
HOLE DIAMETER : 5'
LOCATION : NEDU #922
LAI GEOLOGIST : R. Nelson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

BORING RECORD

Start: 13:45
Finish: 14:50

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	SAMPLE NUMBER	SAMPLE PID READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS BACKGROUND PID READING
	0	2.5YR 4/6, Red, Fine Grained Quartz Rich Sand, Very Well Sorted, Well Rounded, Unconsolidated							13:50
	5				1			5	
	10	Increase in Depth Lithology Remains Same Color Changes to 2.5YR 7/3 to 7/4 Light Reddish Brown at 13'	SM		2			10	13:54
	15				3			15	13:58
	20				4			20	14:03
	25	5YR 7/4, Pink, Fine to Medium Grained Quartz Rich Sand, Moderately Sorted, Rounded to Sub Rounded	SM		5			25	14:10
	30				6			30	14:13
	35				7			35	14:20
	40	7.5YR 9/2, Pale Yellowish Pink, Very Fine to Fine Grained Quartz Grained Sand, Well Sorted, Well Rounded to Sub Rounded			8			40	14:22
	45				9			45	14:25
Depth to Water: 53.71	50	7.5YR 6/8, Reddish Yellow, Very Fine to Fine Grained Quartz Sand, Well Sorted, Well Rounded	SM		10			50	14:30
	55				11			55	14:42
	60				12			60	14:44
	65				13			65	14:50
		TD: 65.35'							

PID READING
PPM X _____
2 4 6 8 10 12 14 16 18

BACKGROUND PID READING
SOIL : _____ PPM
SOIL : _____ PPM

ONE CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HRS)
WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
\+ PENETROMETER (TONS/ SQ. FT)
NR NO RECOVERY

JOB NUMBER : Apache/19-0112-22
HOLE DIAMETER : 5"
LOCATION : NEDU 929
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

Larson & Associates, Inc.
Environmental Consultants

DRILL DATE : 7/20/2021

BORING NUMBER : MW- 3

BORING RECORD

Start: 9:35
Finish: 12:10

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	PID READING (PPM X)	SAMPLE NUMBER	SAMPLE PID READING	SAMPLE RECOVERY	SAMPLE DEPTH	REMARKS BACKGROUND PID READING
	0	Sand, 2.5YR 4/6, Red, Fine Grained Quart Sand, Very Well Sorted, Well Rounded, Unconsolidated, Quartz Rich Sand	SM							SOIL : PPM SOIL : PPM
	5					1			5	9:38
	10					2			10	9:40
	15	Sand, 2.5YR 7/4, Light Reddish Brown, Very Fine to Fine Grained Quartz Sand, Moderately Sorted, Sub Angular to Sub Rounded, with Depth Decrease in Grain Size and Becomes Well Sorted, Quartz Rich Sand				3			15	9:40
	20					4			20	9:42
	25	7.5YR 8/3, Pink, Fine to Medium Grained Quartz Sand, Sub Rounded to Sub Angular, Moderately Sorted, Quartz Rich Sand				5			25	9:45
	30		SM			6			30	10:30
	35	7.5YR 6/4, Light Brown, Fine Grained Quartz Sand, Well Sorted, Rounded to Sub Rounded, with Depth Increase in Consolidation and Cementation, Quartz Rich Sand				7			35	10:35
Depth to Water: 41.05	40					8			40	10:38
	45	7.5YR 7/4, Light Reddish Brown, Poorly Sorted, Fine to Coarse Grained Quartz Sand, Rounded to Angular, Very Consolidated with Red Sandstone Fragments in Cuttings, Quartz Rich Sand				9			45	11:14
	50									
	55									
	60	Introduced Water with Drilling	SM							
	65									
	70									
	75	TD: 76.01								

ONE CONTINUOUS AUGER SAMPLER
STANDARD PENETRATION TEST
UNDISTURBED SAMPLE
WATER TABLE (24 HRS)
WATER TABLE (TIME OF BORING)
L LABORATORY TEST LOCATION
+ PENETROMETER (TONS/ SQ. FT)
NR NO RECOVERY

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 7/20/2021
BORING NUMBER : MW-4

JOB NUMBER : Apache/ 19-0112-22
HOLE DIAMETER : 5"
LOCATION : NEDU 928
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDI
DRILLING METHOD : Air Rotary

Appendix C

Laboratory Reports

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Xenco, Midland
1211 W. Florida Ave
Midland, TX 79701
Tel: (432)704-5440

Laboratory Job ID: 880-4569-1
Laboratory Sample Delivery Group: 19-0112-22
Client Project/Site: NEDU PITS

For:
Larson & Associates, Inc.
507 N Marienfeld
Suite 202
Midland, Texas 79701

Attn: Mr. Mark J Larson

Holly Taylor

Authorized for release by:
8/6/2021 4:21:43 PM

Holly Taylor, Project Manager
(806)794-1296
holly.taylor@eurofinset.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Laboratory Job ID: 880-4569-1
SDG: 19-0112-22

Table of Contents

Definitions/Glossary

Client: Larson & Associates, Inc. Job ID: 880-4569-1
Project/Site: NEDU PITS SDG: 19-0112-22

Qualifiers

GC VOA

Qualifier	Qualifier Description
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Job ID: 880-4569-1

Laboratory: Eurofins Xenco, Midland

Narrative

Job Narrative
880-4569-1

Receipt
The samples were received on 8/2/2021 10:17 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 5.6°C

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Client Sample ID: MW-2

Lab Sample ID: 880-4569-1
Matrix: Water
Date Collected: 07/29/21 10:20
Date Received: 08/02/21 10:17

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.0391**		0.00200		mg/L			08/02/21 22:51	1
Toluene	<0.00200	U	0.00200		mg/L			08/02/21 22:51	1
Ethylbenzene	**0.00219**		0.00200		mg/L			08/02/21 22:51	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			08/02/21 22:51	1
o-Xylene	<0.00200	U	0.00200		mg/L			08/02/21 22:51	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			08/02/21 22:51	1
Total BTEX	**0.0413**		0.00400		mg/L			08/02/21 22:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*53*	*S1-*	*70 - 130*		*08/02/21 22:51*	*1*
1,4-Difluorobenzene (Surr)	*99*		*70 - 130*		*08/02/21 22:51*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**268**		5.00		mg/L			08/05/21 22:50	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1170**		50.0		mg/L			08/02/21 17:00	1

Client Sample ID: MW-3

Lab Sample ID: 880-4569-2
Matrix: Water
Date Collected: 07/29/21 10:40
Date Received: 08/02/21 10:17

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**0.00407**		0.00200		mg/L			08/02/21 23:11	1
Toluene	<0.00200	U	0.00200		mg/L			08/02/21 23:11	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			08/02/21 23:11	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			08/02/21 23:11	1
o-Xylene	<0.00200	U	0.00200		mg/L			08/02/21 23:11	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			08/02/21 23:11	1
Total BTEX	**0.00407**		0.00400		mg/L			08/02/21 23:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*114*		*70 - 130*		*08/02/21 23:11*	*1*
1,4-Difluorobenzene (Surr)	*91*		*70 - 130*		*08/02/21 23:11*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**128**		2.50		mg/L			08/05/21 23:00	5

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**663**		50.0		mg/L			08/02/21 17:00	1

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Client Sample ID: MW-1

Lab Sample ID: 880-4569-3
Matrix: Water
Date Collected: 07/29/21 11:15
Date Received: 08/02/21 10:17

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			08/02/21 23:32	1
Toluene	<0.00200	U	0.00200		mg/L			08/02/21 23:32	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			08/02/21 23:32	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			08/02/21 23:32	1
o-Xylene	<0.00200	U	0.00200		mg/L			08/02/21 23:32	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			08/02/21 23:32	1
Total BTEX	<0.00400	U	0.00400		mg/L			08/02/21 23:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*70 - 130*		*08/02/21 23:32*	*1*
1,4-Difluorobenzene (Surr)	*94*		*70 - 130*		*08/02/21 23:32*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**446**		10.0		mg/L			08/05/21 23:29	20

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2510**		200		mg/L			08/02/21 17:00	1

Client Sample ID: MW-4

Lab Sample ID: 880-4569-4
Matrix: Water
Date Collected: 07/30/21 09:55
Date Received: 08/02/21 10:17

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			08/02/21 23:52	1
Toluene	<0.00200	U	0.00200		mg/L			08/02/21 23:52	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			08/02/21 23:52	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			08/02/21 23:52	1
o-Xylene	<0.00200	U	0.00200		mg/L			08/02/21 23:52	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			08/02/21 23:52	1
Total BTEX	<0.00400	U	0.00400		mg/L			08/02/21 23:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*118*		*70 - 130*		*08/02/21 23:52*	*1*
1,4-Difluorobenzene (Surr)	*95*		*70 - 130*		*08/02/21 23:52*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**559**		5.00		mg/L			08/05/21 23:38	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1030**		50.0		mg/L			08/02/21 17:00	1

Client Sample Results

Client: Larson & Associates, Inc. Job ID: 880-4569-1
Project/Site: NEDU PITS SDG: 19-0112-22

Client Sample ID: DUP-1 Lab Sample ID: 880-4569-5

Date Collected: 07/30/21 00:00 **Matrix: Water**
Date Received: 08/02/21 10:17

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			08/03/21 00:13	1
Toluene	<0.00200	U	0.00200		mg/L			08/03/21 00:13	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			08/03/21 00:13	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			08/03/21 00:13	1
o-Xylene	<0.00200	U	0.00200		mg/L			08/03/21 00:13	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			08/03/21 00:13	1
Total BTEX	<0.00400	U	0.00400		mg/L			08/03/21 00:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*119*		*70 - 130*		*08/03/21 00:13*	*1*
1,4-Difluorobenzene (Surr)	*88*		*70 - 130*		*08/03/21 00:13*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**244**		5.00		mg/L			08/05/21 23:48	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1160**		50.0		mg/L			08/02/21 17:00	1

Client Sample ID: DUP-2 Lab Sample ID: 880-4569-6

Date Collected: 07/30/21 00:00 **Matrix: Water**
Date Received: 08/02/21 10:17

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			08/03/21 00:33	1
Toluene	<0.00200	U	0.00200		mg/L			08/03/21 00:33	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			08/03/21 00:33	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			08/03/21 00:33	1
o-Xylene	<0.00200	U	0.00200		mg/L			08/03/21 00:33	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			08/03/21 00:33	1
Total BTEX	<0.00400	U	0.00400		mg/L			08/03/21 00:33	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*70 - 130*		*08/03/21 00:33*	*1*
1,4-Difluorobenzene (Surr)	*96*		*70 - 130*		*08/03/21 00:33*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**235**		5.00		mg/L			08/05/21 23:57	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1030**		50.0		mg/L			08/02/21 17:00	1

Surrogate Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)											
		BFB1	DFBZ1										
Lab Sample ID	Client Sample ID	(70-130)	(70-130)										
880-4556-A-2 MS	Matrix Spike	106	101										
880-4556-A-2 MSD	Matrix Spike Duplicate	109	101										
880-4569-1	MW-2	53 S1-	99										
880-4569-2	MW-3	114	91										
880-4569-3	MW-1	105	94										
880-4569-4	MW-4	118	95										
880-4569-5	DUP-1	119	88										
880-4569-6	DUP-2	99	96										
LCS 880-5977/3	Lab Control Sample	113	102										
LCSD 880-5977/4	Lab Control Sample Dup	115	103										
MB 880-5977/9	Method Blank	102	92										

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DFBZ = 1,4-Difluorobenzene (Surr)

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 880-5977/9
Matrix: Water
Analysis Batch: 5977

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			08/02/21 16:43	1
Toluene	<0.00200	U	0.00200		mg/L			08/02/21 16:43	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			08/02/21 16:43	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			08/02/21 16:43	1
o-Xylene	<0.00200	U	0.00200		mg/L			08/02/21 16:43	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			08/02/21 16:43	1
Total BTEX	<0.00400	U	0.00400		mg/L			08/02/21 16:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*08/02/21 16:43*	*1*
1,4-Difluorobenzene (Surr)	*92*		*70 - 130*		*08/02/21 16:43*	*1*

Lab Sample ID: LCS 880-5977/3
Matrix: Water
Analysis Batch: 5977

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			0.100	0.1002		mg/L		100	70 - 130		
Toluene			0.100	0.09713		mg/L		97	70 - 130		
Ethylbenzene			0.100	0.09726		mg/L		97	70 - 130		
m,p-Xylenes			0.200	0.1954		mg/L		98	70 - 130		
o-Xylene			0.100	0.09752		mg/L		98	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*113*		*70 - 130*
1,4-Difluorobenzene (Surr)	*102*		*70 - 130*

Lab Sample ID: LCSD 880-5977/4
Matrix: Water
Analysis Batch: 5977

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			0.100	0.1018		mg/L		102	70 - 130	2	20
Toluene			0.100	0.09587		mg/L		96	70 - 130	1	20
Ethylbenzene			0.100	0.09767		mg/L		98	70 - 130	0	20
m,p-Xylenes			0.200	0.1993		mg/L		100	70 - 130	2	20
o-Xylene			0.100	0.1000		mg/L		100	70 - 130	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*115*		*70 - 130*
1,4-Difluorobenzene (Surr)	*103*		*70 - 130*

Lab Sample ID: 880-4556-A-2 MS
Matrix: Water
Analysis Batch: 5977

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene	<0.00200	U	0.100	0.09413		mg/L		94	70 - 130		

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: 880-4556-A-2 MS
Matrix: Water
Analysis Batch: 5977

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Toluene	<0.00200	U	0.100	0.09080		mg/L		90	70 - 130
Ethylbenzene	<0.00200	U	0.100	0.09125		mg/L		91	70 - 130
m,p-Xylenes	<0.00400	U	0.200	0.1880		mg/L		94	70 - 130
o-Xylene	<0.00200	U	0.100	0.09260		mg/L		93	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*106*		*70 - 130*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*

Lab Sample ID: 880-4556-A-2 MSD
Matrix: Water
Analysis Batch: 5977

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	<0.00200	U	0.100	0.1056		mg/L		106	70 - 130	11	25
Toluene	<0.00200	U	0.100	0.1015		mg/L		101	70 - 130	11	25
Ethylbenzene	<0.00200	U	0.100	0.1007		mg/L		101	70 - 130	10	25
m,p-Xylenes	<0.00400	U	0.200	0.2055		mg/L		103	70 - 130	9	25
o-Xylene	<0.00200	U	0.100	0.1019		mg/L		102	70 - 130	10	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*70 - 130*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 880-6085/3
Matrix: Water
Analysis Batch: 6085

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.500	U	0.500		mg/L			08/05/21 21:34	1

Lab Sample ID: LCS 880-6085/4
Matrix: Water
Analysis Batch: 6085

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride			25.0	25.36		mg/L		101	90 - 110

Lab Sample ID: LCSD 880-6085/5
Matrix: Water
Analysis Batch: 6085

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			25.0	25.22		mg/L		101	90 - 110	1	20

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 880-4692-A-1 MS
Matrix: Water
Analysis Batch: 6085

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	14.1		25.0	38.56		mg/L		98	90 - 110		

Lab Sample ID: 880-4692-A-1 MSD
Matrix: Water
Analysis Batch: 6085

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	14.1		25.0	38.65		mg/L		98	90 - 110	0	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 880-6074/1
Matrix: Water
Analysis Batch: 6074

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<25.0	U	25.0		mg/L			08/02/21 17:00	1

Lab Sample ID: LCS 880-6074/2
Matrix: Water
Analysis Batch: 6074

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	1003		mg/L		100	80 - 120		

Lab Sample ID: LCSD 880-6074/3
Matrix: Water
Analysis Batch: 6074

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	1005		mg/L		100	80 - 120	0	10

Lab Sample ID: 880-4569-5 DU
Matrix: Water
Analysis Batch: 6074

Client Sample ID: DUP-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	1160			1186		mg/L				2	10

QC Association Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

GC VOA

Analysis Batch: 5977

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-4569-1	MW-2	Total/NA	Water	8021B	
880-4569-2	MW-3	Total/NA	Water	8021B	
880-4569-3	MW-1	Total/NA	Water	8021B	
880-4569-4	MW-4	Total/NA	Water	8021B	
880-4569-5	DUP-1	Total/NA	Water	8021B	
880-4569-6	DUP-2	Total/NA	Water	8021B	
MB 880-5977/9	Method Blank	Total/NA	Water	8021B	
LCS 880-5977/3	Lab Control Sample	Total/NA	Water	8021B	
LCSD 880-5977/4	Lab Control Sample Dup	Total/NA	Water	8021B	
880-4556-A-2 MS	Matrix Spike	Total/NA	Water	8021B	
880-4556-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8021B	

HPLC/IC

Analysis Batch: 6085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-4569-1	MW-2	Total/NA	Water	300.0	
880-4569-2	MW-3	Total/NA	Water	300.0	
880-4569-3	MW-1	Total/NA	Water	300.0	
880-4569-4	MW-4	Total/NA	Water	300.0	
880-4569-5	DUP-1	Total/NA	Water	300.0	
880-4569-6	DUP-2	Total/NA	Water	300.0	
MB 880-6085/3	Method Blank	Total/NA	Water	300.0	
LCS 880-6085/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 880-6085/5	Lab Control Sample Dup	Total/NA	Water	300.0	
880-4692-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
880-4692-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

General Chemistry

Analysis Batch: 6074

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-4569-1	MW-2	Total/NA	Water	SM 2540C	
880-4569-2	MW-3	Total/NA	Water	SM 2540C	
880-4569-3	MW-1	Total/NA	Water	SM 2540C	
880-4569-4	MW-4	Total/NA	Water	SM 2540C	
880-4569-5	DUP-1	Total/NA	Water	SM 2540C	
880-4569-6	DUP-2	Total/NA	Water	SM 2540C	
MB 880-6074/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 880-6074/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 880-6074/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
880-4569-5 DU	DUP-1	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Client Sample ID: MW-2

Date Collected: 07/29/21 10:20
Date Received: 08/02/21 10:17

Lab Sample ID: 880-4569-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	5977	08/02/21 22:51	KL	XEN MID
Total/NA	Analysis	300.0		10			6085	08/05/21 22:50	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	6074	08/02/21 17:00	SC	XEN MID

Client Sample ID: MW-3

Date Collected: 07/29/21 10:40
Date Received: 08/02/21 10:17

Lab Sample ID: 880-4569-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	5977	08/02/21 23:11	KL	XEN MID
Total/NA	Analysis	300.0		5			6085	08/05/21 23:00	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	6074	08/02/21 17:00	SC	XEN MID

Client Sample ID: MW-1

Date Collected: 07/29/21 11:15
Date Received: 08/02/21 10:17

Lab Sample ID: 880-4569-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	5977	08/02/21 23:32	KL	XEN MID
Total/NA	Analysis	300.0		20			6085	08/05/21 23:29	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	25 mL	200 mL	6074	08/02/21 17:00	SC	XEN MID

Client Sample ID: MW-4

Date Collected: 07/30/21 09:55
Date Received: 08/02/21 10:17

Lab Sample ID: 880-4569-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	5977	08/02/21 23:52	KL	XEN MID
Total/NA	Analysis	300.0		10			6085	08/05/21 23:38	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	6074	08/02/21 17:00	SC	XEN MID

Client Sample ID: DUP-1

Date Collected: 07/30/21 00:00
Date Received: 08/02/21 10:17

Lab Sample ID: 880-4569-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	5977	08/03/21 00:13	KL	XEN MID
Total/NA	Analysis	300.0		10			6085	08/05/21 23:48	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	6074	08/02/21 17:00	SC	XEN MID

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Client Sample ID: DUP-2
Date Collected: 07/30/21 00:00
Date Received: 08/02/21 10:17

Lab Sample ID: 880-4569-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	5977	08/03/21 00:33	KL	XEN MID
Total/NA	Analysis	300.0		10			6085	08/05/21 23:57	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	6074	08/02/21 17:00	SC	XEN MID

Laboratory References:

XEN MID = Eurofins Xenco, Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440

Accreditation/Certification Summary

Client: Larson & Associates, Inc. Job ID: 880-4569-1
Project/Site: NEDU PITS SDG: 19-0112-22

Laboratory: Eurofins Xenco, Midland

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704400-20-21	06-30-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8021B		Water	Total BTEX

Method Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Method	Method Description	Protocol	Laboratory
8021B	Volatile Organic Compounds (GC)	SW846	XEN MID
300.0	Anions, Ion Chromatography	MCAWW	XEN MID
SM 2540C	Solids, Total Dissolved (TDS)	SM	XEN MID
5030B	Purge and Trap	SW846	XEN MID

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

XEN MID = Eurofins Xenco, Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440

Sample Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU PITS

Job ID: 880-4569-1
SDG: 19-0112-22

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
880-4569-1	MW-2	Water	07/29/21 10:20	08/02/21 10:17
880-4569-2	MW-3	Water	07/29/21 10:40	08/02/21 10:17
880-4569-3	MW-1	Water	07/29/21 11:15	08/02/21 10:17
880-4569-4	MW-4	Water	07/30/21 09:55	08/02/21 10:17
880-4569-5	DUP-1	Water	07/30/21 00:00	08/02/21 10:17
880-4569-6	DUP-2	Water	07/30/21 00:00	08/02/21 10:17

Nº 1615

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
Midland, TX 79701
432-687-0901

8/2/21 PAGE 1 OF 1

Data Reported to

LAB WORK ORDER#: 880-45569

PROJECT LOCATION OR NAME: NEDU pits

LAI PROJECT #: 19-0112-22 COLLECTOR: TJ

TRRP report? ☐ Yes ☒ No

S=SOIL P=PAINT
W=WATER SL=SLUDGE
A=AIR OT=OTHER

TIME ZONE
Time zone/State: MST

Field Sample I D	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESERVED	ANALYSES: BTEX ☒ MTBE ☐	TRPH 418.1 ☐	TPH 1005 ☐	TPH 1006 ☐	GASOLINE MOD 8015 ☐	DIESEL - MOD 8015 ☐	OIL - MOD 8015 ☐	VOC 8260 ☐	SVOC 8270 ☐	PAH 8270 ☐	HOLDPAH ☐	8081 PESTICIDES ☐	8151 HERBICIDES ☐	8082 PCBS ☐	TCLP - METALS (RCRA) ☐	TCLP VOC ☐	TCLP - PEST ☐	HERB ☐	Semi-VOC ☐	TOTAL METALS (RCRA) ☐	OTHER LIST ☐	LEAD - TOTAL ☐	D W 200.8 ☐	TCLP ☐	RCI ☐	TOX ☐	FLASHPOINT ☐	TDS ☒ TSS ☐	% MOISTURE ☐	pH ☐	HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐	CYANIDE ☐	PECHLORATE ☐	CHLORIDE ☒ ANIONS ☐	ALKALINITY ☐	FIELD NOTES
MW-2		7/29/21	1020	W	5	X			X		X																							X					X					Bill direct
MW-3		"	1040	"	"	"			"		"																							"					"					to Apache
MW-1		"	1115	"	"	"			"		"																							"					"					
MW-4		7/30/21	0955	"	"	"			"		"																							"					"					
DUP-1				"	"	"			"		"																							"					"					
DUP-2				"	"	"			"		"																							"					"					

TOTAL 6

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
[signature]	8/2/21 1017	[signature]
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)

LABORATORY Xenco

TURN AROUND TIME
NORMAL ☒
1 DAY ☐
2 DAY ☐
OTHER ☐

LABORATORY USE ONLY:
RECEIVING TEMP 5.1/5.6 THERM# IR8
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☑ NOT USED
☐ CARRIER BILL #
☑ HAND DELIVERED

Login Sample Receipt Checklist

Client: Larson & Associates, Inc.

Job Number: 880-4569-1
SDG Number: 19-0112-22

Login Number: 4569
List Number: 1
Creator: Phillips, Kerianna

List Source: Eurofins Xenco, Midland

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Xenco, Midland
1211 W. Florida Ave
Midland, TX 79701
Tel: (432)704-5440

Laboratory Job ID: 880-8148-1
Laboratory Sample Delivery Group: 19-0112-22
Client Project/Site: NEDU 928,929,922,830,829 Drill

For:
Larson & Associates, Inc.
507 N Marienfeld
Suite 202
Midland, Texas 79701

Attn: Mr. Mark J Larson

Holly Taylor

Authorized for release by:
11/18/2021 5:09:31 PM

Holly Taylor, Project Manager
(806)794-1296
holly.taylor@eurofinset.com

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Laboratory Job ID: 880-8148-1
SDG: 19-0112-22

Table of Contents

Definitions/Glossary

Client: Larson & Associates, Inc. Job ID: 880-8148-1
Project/Site: NEDU 928,929,922,830,829 Drill SDG: 19-0112-22

Qualifiers

GC VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Job ID: 880-8148-1

Laboratory: Eurofins Xenco, Midland

Narrative

Job Narrative
880-8148-1

Receipt
The samples were received on 11/10/2021 9:20 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.4°C

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

HPLC/IC
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Client Sample ID: MW-1

Lab Sample ID: 880-8148-1

Date Collected: 11/08/21 09:15
Date Received: 11/10/21 09:20

Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			11/18/21 01:34	1
Toluene	<0.00200	U	0.00200		mg/L			11/18/21 01:34	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			11/18/21 01:34	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			11/18/21 01:34	1
o-Xylene	<0.00200	U	0.00200		mg/L			11/18/21 01:34	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			11/18/21 01:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*120*		*70 - 130*		*11/18/21 01:34*	*1*
1,4-Difluorobenzene (Surr)	*100*		*70 - 130*		*11/18/21 01:34*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			11/16/21 14:23	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**1270**		10.0		mg/L			11/14/21 16:56	20

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**2490**		200		mg/L			11/11/21 18:50	1

Client Sample ID: MW-2

Lab Sample ID: 880-8148-2

Date Collected: 11/08/21 10:00
Date Received: 11/10/21 09:20

Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			11/18/21 01:55	1
Toluene	<0.00200	U	0.00200		mg/L			11/18/21 01:55	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			11/18/21 01:55	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			11/18/21 01:55	1
o-Xylene	<0.00200	U	0.00200		mg/L			11/18/21 01:55	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			11/18/21 01:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*120*		*70 - 130*		*11/18/21 01:55*	*1*
1,4-Difluorobenzene (Surr)	*98*		*70 - 130*		*11/18/21 01:55*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			11/16/21 14:23	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**279**		5.00		mg/L			11/14/21 17:04	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		50.0		mg/L			11/11/21 18:50	1

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Client Sample ID: MW-3

Lab Sample ID: 880-8148-3
Matrix: Water
Date Collected: 11/08/21 10:25
Date Received: 11/10/21 09:20

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			11/18/21 02:15	1
Toluene	<0.00200	U	0.00200		mg/L			11/18/21 02:15	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			11/18/21 02:15	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			11/18/21 02:15	1
o-Xylene	<0.00200	U	0.00200		mg/L			11/18/21 02:15	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			11/18/21 02:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*119*		*70 - 130*		*11/18/21 02:15*	*1*
1,4-Difluorobenzene (Surr)	*99*		*70 - 130*		*11/18/21 02:15*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			11/16/21 14:23	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**122**		2.50		mg/L			11/14/21 17:11	5

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**644**		50.0		mg/L			11/11/21 18:50	1

Client Sample ID: MW-4

Lab Sample ID: 880-8148-4
Matrix: Water
Date Collected: 11/08/21 10:50
Date Received: 11/10/21 09:20

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			11/18/21 02:36	1
Toluene	<0.00200	U	0.00200		mg/L			11/18/21 02:36	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			11/18/21 02:36	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			11/18/21 02:36	1
o-Xylene	<0.00200	U	0.00200		mg/L			11/18/21 02:36	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			11/18/21 02:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*119*		*70 - 130*		*11/18/21 02:36*	*1*
1,4-Difluorobenzene (Surr)	*102*		*70 - 130*		*11/18/21 02:36*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			11/16/21 14:23	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**203**		5.00		mg/L			11/14/21 17:18	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**832**		50.0		mg/L			11/11/21 18:50	1

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Client Sample ID: DUP-1

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 09:20

Lab Sample ID: 880-8148-5

Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			11/18/21 02:56	1
Toluene	<0.00200	U	0.00200		mg/L			11/18/21 02:56	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			11/18/21 02:56	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			11/18/21 02:56	1
o-Xylene	<0.00200	U	0.00200		mg/L			11/18/21 02:56	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			11/18/21 02:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*115*		*70 - 130*		*11/18/21 02:56*	*1*
1,4-Difluorobenzene (Surr)	*92*		*70 - 130*		*11/18/21 02:56*	*1*

Method: Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400		mg/L			11/16/21 14:23	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**270**		5.00		mg/L			11/14/21 17:41	10

General Chemistry

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		50.0		mg/L			11/11/21 18:50	1

Surrogate Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	BFB1 (70-130)	BFB1 (70-130)	DFBZ1 (70-130)	DFBZ1 (70-130)
880-8148-1	MW-1	120	120	100	100
880-8148-1 MS	MW-1	118	118	104	104
880-8148-1 MSD	MW-1	113	113	100	100
880-8148-2	MW-2	120	120	98	98
880-8148-3	MW-3	119	119	99	99
880-8148-4	MW-4	119	119	102	102
880-8148-5	DUP-1	115	115	92	92
LCS 880-12499/34	Lab Control Sample	111	111	99	99
LCSD 880-12499/35	Lab Control Sample Dup	128	128	106	106
MB 880-12436/5-A	Method Blank	122	122	103	103
MB 880-12499/39	Method Blank	124	124	103	103

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DFBZ = 1,4-Difluorobenzene (Surr)

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 880-12436/5-A
Matrix: Water
Analysis Batch: 12499

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 12436

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L		11/17/21 10:11	11/17/21 13:32	1
Toluene	<0.00200	U	0.00200		mg/L		11/17/21 10:11	11/17/21 13:32	1
Ethylbenzene	<0.00200	U	0.00200		mg/L		11/17/21 10:11	11/17/21 13:32	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L		11/17/21 10:11	11/17/21 13:32	1
o-Xylene	<0.00200	U	0.00200		mg/L		11/17/21 10:11	11/17/21 13:32	1
Xylenes, Total	<0.00400	U	0.00400		mg/L		11/17/21 10:11	11/17/21 13:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*122*		*70 - 130*	*11/17/21 10:11*	*11/17/21 13:32*	*1*
1,4-Difluorobenzene (Surr)	*103*		*70 - 130*	*11/17/21 10:11*	*11/17/21 13:32*	*1*

Lab Sample ID: MB 880-12499/39
Matrix: Water
Analysis Batch: 12499

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200		mg/L			11/18/21 01:06	1
Toluene	<0.00200	U	0.00200		mg/L			11/18/21 01:06	1
Ethylbenzene	<0.00200	U	0.00200		mg/L			11/18/21 01:06	1
m,p-Xylenes	<0.00400	U	0.00400		mg/L			11/18/21 01:06	1
o-Xylene	<0.00200	U	0.00200		mg/L			11/18/21 01:06	1
Xylenes, Total	<0.00400	U	0.00400		mg/L			11/18/21 01:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*124*		*70 - 130*		*11/18/21 01:06*	*1*
1,4-Difluorobenzene (Surr)	*103*		*70 - 130*		*11/18/21 01:06*	*1*

Lab Sample ID: LCS 880-12499/34
Matrix: Water
Analysis Batch: 12499

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			0.100	0.09185		mg/L		92	70 - 130		
Toluene			0.100	0.09491		mg/L		95	70 - 130		
Ethylbenzene			0.100	0.09163		mg/L		92	70 - 130		
m,p-Xylenes			0.200	0.1833		mg/L		92	70 - 130		
o-Xylene			0.100	0.08748		mg/L		87	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*111*		*70 - 130*
1,4-Difluorobenzene (Surr)	*99*		*70 - 130*

Lab Sample ID: LCSD 880-12499/35
Matrix: Water
Analysis Batch: 12499

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			0.100	0.08277		mg/L		83	70 - 130	10	20

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Method: 8021B - Volatile Organic Compounds (GC) (Continued)

Lab Sample ID: LCSD 880-12499/35
Matrix: Water
Analysis Batch: 12499

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Toluene			0.100	0.1064		mg/L		106	70 - 130	11	20
Ethylbenzene			0.100	0.09516		mg/L		95	70 - 130	4	20
m,p-Xylenes			0.200	0.1862		mg/L		93	70 - 130	2	20
o-Xylene			0.100	0.09402		mg/L		94	70 - 130	7	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*128*		*70 - 130*
1,4-Difluorobenzene (Surr)	*106*		*70 - 130*

Lab Sample ID: 880-8148-1 MS
Matrix: Water
Analysis Batch: 12499

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	<0.00200	U	0.100	0.09751		mg/L		98	70 - 130
Benzene	<0.00200	U	0.100	0.09751		mg/L		98	70 - 130
Toluene	<0.00200	U	0.100	0.09539		mg/L		94	70 - 130
Toluene	<0.00200	U	0.100	0.09539		mg/L		94	70 - 130
Ethylbenzene	<0.00200	U	0.100	0.1007		mg/L		101	70 - 130
Ethylbenzene	<0.00200	U	0.100	0.1007		mg/L		101	70 - 130
m,p-Xylenes	<0.00400	U	0.200	0.2001		mg/L		100	70 - 130
m,p-Xylenes	<0.00400	U	0.200	0.2001		mg/L		100	70 - 130
o-Xylene	<0.00200	U	0.100	0.09823		mg/L		98	70 - 130
o-Xylene	<0.00200	U	0.100	0.09823		mg/L		98	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*118*		*70 - 130*
4-Bromofluorobenzene (Surr)	*118*		*70 - 130*
1,4-Difluorobenzene (Surr)	*104*		*70 - 130*
1,4-Difluorobenzene (Surr)	*104*		*70 - 130*

Lab Sample ID: 880-8148-1 MSD
Matrix: Water
Analysis Batch: 12499

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	<0.00200	U	0.100	0.09328		mg/L		93	70 - 130	4	25
Toluene	<0.00200	U	0.100	0.09560		mg/L		95	70 - 130	0	25
Ethylbenzene	<0.00200	U	0.100	0.09624		mg/L		96	70 - 130	4	25
m,p-Xylenes	<0.00400	U	0.200	0.1909		mg/L		95	70 - 130	5	25
o-Xylene	<0.00200	U	0.100	0.09133		mg/L		91	70 - 130	7	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*113*		*70 - 130*
1,4-Difluorobenzene (Surr)	*100*		*70 - 130*

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 880-12213/3
Matrix: Water
Analysis Batch: 12213

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.500	U	0.500		mg/L			11/14/21 16:12	1

Lab Sample ID: LCS 880-12213/4
Matrix: Water
Analysis Batch: 12213

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride			25.0	25.49		mg/L		102	90 - 110		

Lab Sample ID: LCSD 880-12213/5
Matrix: Water
Analysis Batch: 12213

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride			25.0	25.40		mg/L		102	90 - 110	0	20

Lab Sample ID: 880-8282-B-1 MS
Matrix: Water
Analysis Batch: 12213

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Chloride	2690		1250	3923		mg/L		99	90 - 110		

Lab Sample ID: 880-8282-B-1 MSD
Matrix: Water
Analysis Batch: 12213

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2690		1250	3916		mg/L		98	90 - 110	0	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 880-12214/1
Matrix: Water
Analysis Batch: 12214

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<25.0	U	25.0		mg/L			11/11/21 18:50	1

Lab Sample ID: LCS 880-12214/2
Matrix: Water
Analysis Batch: 12214

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1000	993.0		mg/L		99	80 - 120		

QC Sample Results

Client: Larson & Associates, Inc. Job ID: 880-8148-1
Project/Site: NEDU 928,929,922,830,829 Drill SDG: 19-0112-22

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: LCSD 880-12214/3 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 12214

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids			1000	996.0		mg/L		100	80 - 120	0	10

Lab Sample ID: 880-8148-1 DU **Client Sample ID: MW-1**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 12214

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	2490			2540		mg/L				2	10

QC Association Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

GC VOA

Analysis Batch: 12338

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-8148-1	MW-1	Total/NA	Water	Total BTEX	
880-8148-2	MW-2	Total/NA	Water	Total BTEX	
880-8148-3	MW-3	Total/NA	Water	Total BTEX	
880-8148-4	MW-4	Total/NA	Water	Total BTEX	
880-8148-5	DUP-1	Total/NA	Water	Total BTEX	

Prep Batch: 12436

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 880-12436/5-A	Method Blank	Total/NA	Water	5035	

Analysis Batch: 12499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-8148-1	MW-1	Total/NA	Water	8021B	
880-8148-2	MW-2	Total/NA	Water	8021B	
880-8148-3	MW-3	Total/NA	Water	8021B	
880-8148-4	MW-4	Total/NA	Water	8021B	
880-8148-5	DUP-1	Total/NA	Water	8021B	
MB 880-12436/5-A	Method Blank	Total/NA	Water	8021B	12436
MB 880-12499/39	Method Blank	Total/NA	Water	8021B	
LCS 880-12499/34	Lab Control Sample	Total/NA	Water	8021B	
LCSD 880-12499/35	Lab Control Sample Dup	Total/NA	Water	8021B	
880-8148-1 MS	MW-1	Total/NA	Water	8021B	
880-8148-1 MSD	MW-1	Total/NA	Water	8021B	

HPLC/IC

Analysis Batch: 12213

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-8148-1	MW-1	Total/NA	Water	300.0	
880-8148-2	MW-2	Total/NA	Water	300.0	
880-8148-3	MW-3	Total/NA	Water	300.0	
880-8148-4	MW-4	Total/NA	Water	300.0	
880-8148-5	DUP-1	Total/NA	Water	300.0	
MB 880-12213/3	Method Blank	Total/NA	Water	300.0	
LCS 880-12213/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 880-12213/5	Lab Control Sample Dup	Total/NA	Water	300.0	
880-8282-B-1 MS	Matrix Spike	Total/NA	Water	300.0	
880-8282-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

General Chemistry

Analysis Batch: 12214

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-8148-1	MW-1	Total/NA	Water	SM 2540C	
880-8148-2	MW-2	Total/NA	Water	SM 2540C	
880-8148-3	MW-3	Total/NA	Water	SM 2540C	
880-8148-4	MW-4	Total/NA	Water	SM 2540C	
880-8148-5	DUP-1	Total/NA	Water	SM 2540C	
MB 880-12214/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 880-12214/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 880-12214/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
880-8148-1 DU	MW-1	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Client Sample ID: MW-1

Date Collected: 11/08/21 09:15
Date Received: 11/10/21 09:20

Lab Sample ID: 880-8148-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	12499	11/18/21 01:34	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			12338	11/16/21 14:23	AJ	XEN MID
Total/NA	Analysis	300.0		20			12213	11/14/21 16:56	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	25 mL	200 mL	12214	11/11/21 18:50	SC	XEN MID

Client Sample ID: MW-2

Date Collected: 11/08/21 10:00
Date Received: 11/10/21 09:20

Lab Sample ID: 880-8148-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	12499	11/18/21 01:55	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			12338	11/16/21 14:23	AJ	XEN MID
Total/NA	Analysis	300.0		10			12213	11/14/21 17:04	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	12214	11/11/21 18:50	SC	XEN MID

Client Sample ID: MW-3

Date Collected: 11/08/21 10:25
Date Received: 11/10/21 09:20

Lab Sample ID: 880-8148-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	12499	11/18/21 02:15	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			12338	11/16/21 14:23	AJ	XEN MID
Total/NA	Analysis	300.0		5			12213	11/14/21 17:11	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	12214	11/11/21 18:50	SC	XEN MID

Client Sample ID: MW-4

Date Collected: 11/08/21 10:50
Date Received: 11/10/21 09:20

Lab Sample ID: 880-8148-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	12499	11/18/21 02:36	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			12338	11/16/21 14:23	AJ	XEN MID
Total/NA	Analysis	300.0		10			12213	11/14/21 17:18	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	12214	11/11/21 18:50	SC	XEN MID

Client Sample ID: DUP-1

Date Collected: 11/08/21 00:00
Date Received: 11/10/21 09:20

Lab Sample ID: 880-8148-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	12499	11/18/21 02:56	MR	XEN MID
Total/NA	Analysis	Total BTEX		1			12338	11/16/21 14:23	AJ	XEN MID
Total/NA	Analysis	300.0		10			12213	11/14/21 17:41	CH	XEN MID
Total/NA	Analysis	SM 2540C		1	100 mL	200 mL	12214	11/11/21 18:50	SC	XEN MID

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Laboratory References:

XEN MID = Eurofins Xenco, Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440

Accreditation/Certification Summary

Client: Larson & Associates, Inc. Job ID: 880-8148-1
Project/Site: NEDU 928,929,922,830,829 Drill SDG: 19-0112-22

Laboratory: Eurofins Xenco, Midland

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704400-21-22	06-30-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Total BTEX		Water	Total BTEX

Method Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Method	Method Description	Protocol	Laboratory
8021B	Volatile Organic Compounds (GC)	SW846	XEN MID
Total BTEX	Total BTEX Calculation	TAL SOP	XEN MID
300.0	Anions, Ion Chromatography	MCAWW	XEN MID
SM 2540C	Solids, Total Dissolved (TDS)	SM	XEN MID
5030B	Purge and Trap	SW846	XEN MID

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

Laboratory References:

XEN MID = Eurofins Xenco, Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440

Sample Summary

Client: Larson & Associates, Inc.
Project/Site: NEDU 928,929,922,830,829 Drill

Job ID: 880-8148-1
SDG: 19-0112-22

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
880-8148-1	MW-1	Water	11/08/21 09:15	11/10/21 09:20
880-8148-2	MW-2	Water	11/08/21 10:00	11/10/21 09:20
880-8148-3	MW-3	Water	11/08/21 10:25	11/10/21 09:20
880-8148-4	MW-4	Water	11/08/21 10:50	11/10/21 09:20
880-8148-5	DUP-1	Water	11/08/21 00:00	11/10/21 09:20

No. 2226

CHAIN-OF-CUSTODY

880-8148 Chain of Custody

DATE 11/10/2021

PAGE 1 OF 1

PO#:

LAB WORK ORDER#:

PROJECT LOCATION OR NAME: NEDU 928, 929, 922, 830, 829 Drill Pits

LAI PROJECT #: 19-0112-22

COLLECTOR: TP & MB

Larson & Associates, Inc.
Environmental Consultants
507 N Marienfeld Ste 202
Midland, TX 79701
432-687-0901

Data Reported to

TRRP report? ☐ Yes ☒ No

S=SOIL, W=WATER, A=AIR, P=PAINT, SL=SLUDGE, OT=OTHER

TIME ZONE (Time zone/State): MST / NM

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	HCl x3	HNO₃	H₂SO₄ ☐ NaOH ☐	ICE x1	UNPRESERVED	BTEX ☑ MTBE ☐	TRPH 418.1 ☐ TPH 1005 ☐ TPH 1006 ☐	GASOLINE MOD 8015 ☐	DIESEL - MOD 8015 ☐	OIL - MOD 8015 ☐	VOC 8260 ☐	SVOC 8270 ☐ PAH 8270 ☐ HOLD PAH ☐	8081 PESTICIDES ☐ 8151 HERBICIDES ☐	8082 PCBS ☐ TCLP VOC ☐	TCLP - METALS (RCRA) ☐ TCLP Semi-VOC ☐	TCLP PEST ☐ HERB ☐ OTHER LIST ☐	TOTAL METALS (RCRA) ☐ TCLP ☐	LEAD - TOTAL ☐ D.W. 200.8 ☐ TCLP ☐	RCI ☐ TOX ☐ FLASHPOINT ☐	TDS ☑ TSS ☐ % MOISTURE ☐ CYANIDE ☐	pH ☐ HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐ PECHLORATE ☐	CHLORIDE ☑ ANIONS ☐ ALKALINITY ☐	FIELD NOTES
MW-1		11/8/21	0915	W	4	X			X		X														X			X	Direct Bill to Apache. Report to LAI.
MW-2		〃	1000	〃	〃	〃			〃		〃														〃			〃	
MW-3		〃	1025	〃	〃	〃			〃		〃														〃			〃	
MW-4		〃	1050	〃	〃	〃			〃		〃														〃			〃	
Dup-1		〃	–	〃	〃	〃			〃		〃														〃			〃	

TOTAL

RELINQUISHED BY (Signature)	DATE/TIME	RECEIVED BY (Signature)
[signature]	11/10/21 0920	Leticia R

LABORATORY: Xenco

TURN AROUND TIME
- NORMAL ☒
- 1 DAY ☐
- 2 DAY ☐
- OTHER ☐

LABORATORY USE ONLY:
- RECEIVING TEMP 4.3 THERM# 44
- CUSTODY SEALS - ☐ BROKEN ☑ INTACT ☐ NOT USED
- ☐ CARRIER BILL #
- ☑ HAND DELIVERED

Login Sample Receipt Checklist

Client: Larson & Associates, Inc.

Job Number: 880-8148-1
SDG Number: 19-0112-22

Login Number: 8148
List Number: 1
Creator: Teel, Brianna

List Source: Eurofins Xenco, Midland

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	

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 373804

CONDITIONS

Operator: APACHE CORPORATION 303 Veterans Airpark Ln Midland, TX 79705	OGRID: 873
	Action Number: 373804
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	NEDU-Pits-2021-Semiannual-(June-Dec)-Groundwater-Monitoring-Report has been accepted for the record, App ID: 373804, received by OCD on 08/14/2024.	8/28/2024