

January 30,  
2023

**Tracking Number: nRM1926352539 / 1RP-5677  
2022 4th Quarter (October – December) Groundwater Monitoring  
Report, North Monument G/SA Unit #2102  
Lea County, New Mexico**

Prepared for:



Apache Corporation  
2350 West Marland Blvd.  
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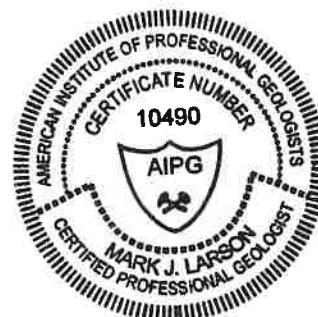
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2022 4th Quarter Groundwater Monitoring Report  
North Monument G/SA Unit #002  
Lea County, New Mexico  
January 30, 2023

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## 1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) has prepared this 2022 fourth quarter (October – December) groundwater monitoring report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) in Santa Fe and Hobbs, New Mexico. This report presents the 2022 fourth (4<sup>th</sup>) quarter laboratory analysis of groundwater samples collected from three (3) monitoring wells (MW-2, TMW-1, and TMW-2) at the North Monument Grayburg San Andres Unit (NM G/SAU) #2102 (Site) located in Unit O (SW/4, SE/4), Section 32, Township 19 South, Range 37 East, in Lea County, New Mexico. The geodetic position is North 32.61233° and West -103.27262°.

The following activities occurred on December 12, 2022:

- Gauged three (3) monitoring wells (MW-2, TMW-1, and TMW-2) for light nonaqueous phase liquid (LNAPL) and depth to groundwater.
- Purged and sampled groundwater from three (3) monitor wells (MW-2, TMW-1, and TMW-2).
- Analyzed groundwater samples for benzene, toluene, ethylbenzene, xylenes (BTEX) and chloride.

The following observations are documented in this report:

- Depth to groundwater on December 12, 2022, ranged from 10.93 feet beneath ground surface (bgs) in monitoring well MW-2 to 23.49 feet bgs in monitoring well TMW-2.
- Groundwater flows from northwest to southeast at a gradient of about 0.0266 feet per foot (ft/ft).
- No significant changes in groundwater flow direction or gradient were observed on December 12, 2022.
- Monitoring well MW-2 remains hydraulically up-gradient and representative of background conditions with a chloride concentration of 223 mg/L, and below the New Mexico Water Quality Control Commission (NMWQCC) domestic water quality standard of 250 mg/L.
- BTEX concentrations were below the analytical method reporting limits (RL) and NMWQCC human health standards in all monitor wells on December 12, 2022.
- The chloride concentrations in samples from wells TMW-1 (358 mg/L) and TMW-2 (338 mg/L) exceeded the NMWQCC domestic water quality standard of 250 mg/L.

Apache proposes the following:

- Apache requests approval to reduce groundwater monitoring frequency from quarterly (4 time per year) to semi-annual (2 times per year) and submit reports to NMOCD after each semi-annual monitoring event.
- Apache will provide at least a 7-day notice to NMOCD prior to each groundwater monitoring event.
- Apache will provide immediate notification to NMOCD if there's a significant change in analyte concentrations.

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Lea County, New Mexico  
January 30, 2023

## 2.0 INTRODUCTION

Larson & Associates, Inc. (LAI) has prepared this 2022 fourth (4<sup>th</sup>) quarter (October – December) groundwater monitoring report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (NMOCD) in Santa Fe and Hobbs, New Mexico. This report presents 2022 fourth (4<sup>th</sup>) quarter (December 12, 2022) laboratory analysis of groundwater samples from 3 monitoring wells (MW-2, TMW-1, and TMW-2) at the North Monument Grayburg San Andres Unit (NMS/SAU Well #2102 (Site) located in Unit O (SW/4, SE/4), Section 32, Township 19 South, Range 37 East, in Lea County, New Mexico. The geodetic position is North 32.61233° and West -103.27262°. Figure 1 presents a topographic map.

### 2.1 Background

A crude oil and produced water release occurred on August 16, 2019, due to corrosion and failure of a buried 3-inch steel flowline. The failure allowed for an unknown volume of crude oil and produced water to be released. Approximately 2.5 barrels (bbls) of crude oil and produced water were recovered. The fluid pooled in the pasture south of the well pad and west of the lease road. Immediate notice was given to Mr. Dylan Rose-Cross (NMOCD) by Mr. Jeffery Broom (Apache Environmental Tech) via email on August 16, 2019. The surface ownership is private. The initial C-141 was submitted on August 29, 2019, and assigned remediation permit number of 1RP-5677. Appendix A presents the initial C-141.

On October 10, 2019, Apache applied for a variance to backfill the excavation due to the presence of groundwater between approximately 21 to 23 feet bgs with TPH and chloride concentrations remaining above the NMOCD limits in soil below the excavation at approximately 12 feet bgs. The request stated that Apache would backfill the excavation with clean caliche to about 6 feet bgs, install a 20-mil polyethylene synthetic liner, and complete backfilling with clean topsoil containing chloride less than 600 mg/Kg.

On October 16, 2019, NMOCD conditionally approved the variance request with the condition that Apache install two (2) monitor wells, with TMW-1 installed as close as possible to the source of the release and TMW-2 installed hydraulically down gradient approximately 150 feet southeast of the excavation. NMOCD requested one (1) monitor well be installed hydraulically upgradient to monitor background groundwater quality. Apache used an existing monitoring well (NMGSAU #1631, MW-2) located approximately 375 feet northwest for the up-gradient monitoring well.

On November 14, 2019, Apache backfilled the excavation with clean caliche to about 6 feet bgs prior to installing the 20-mil polyethylene synthetic liner and completed backfilling above the liner with clean topsoil to the surface. The backfilled area measures approximately 16,024 square feet and was seeded with BLM Mix #2.

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On March 11, 2020, Scarborough Drilling, Inc. (SDI) under supervision from LAI installed the monitoring wells TMW-1 and TMW-2 utilizing an air rotary rig. The wells were drilled to depths of approximately 30 feet bgs. The wells were installed at the locations presented in Figure 3.

The wells were completed with 2-inch schedule 40 threaded PVC casing. Twenty (20) feet of 0.010-inch factory slotted screen was installed above and below the groundwater observed at the time of drilling. The well screen is surrounded with graded silica sand to about 2 feet above the well screen. The annular space above the sand was filled with bentonite chips to about 1-foot bgs. The wells were secured with locking steel protectors anchored in concrete. West Company, a State of New Mexico licensed professional land surveyor (License Number 23263) surveyed the monitoring wells for position and elevation including top of casing and natural ground surface. The wells were logged according to the Unified Soil Classification System (ASTM D 2487-06).

On December 21, 2020, LAI issued a report titled "1RP-5677 Closure Report North Monument G/SA Unit #2102 Produced Water and Crude Oil Release" documenting the excavation closure and monitoring well installations. The report was submitted to the NMOCD in Santa Fe and Hobbs, New Mexico. No response has been received from the NMOCD regarding this closure report and the release remains open on the NMOCD web portal. Appendix B presents the well logs and completion records.

## **2.2 Physical Setting**

The physical setting is as follows:

- The surface elevation is approximately 3,564 feet above mean sea level (msl).
- The topography slopes gently towards the southeast.
- There are no surface water features within 1,000 feet of the Site.
- Karst data provided by the USGS describes this site as "Low Risk Potential".
- The soils are designated Berino-Cacique fine sandy loams association, 0 to 3 percent slopes, consisting of 8 inches of fine sandy loam and 52 inches of sandy clay loam in descending order.
- The surface geology consists of Eolian and piedmont deposits (Holocene to middle Pleistocene) interlayered eolian sands and piedmont-slop deposits.
- Groundwater occurs in the Ogallala Formation between about 21 to 23 feet below ground surface (bgs) based on depth to groundwater from two (2) monitoring wells installed near the excavation.

Appendix C presents the Karst Potential Map

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## 3.0 GROUNDWATER MONITORING

### 3.1 Depth to Groundwater and Groundwater Potentiometric Elevation

On December 12, 2022, LAI personnel gauged monitor wells MW-2, TMW-1, and TMW-2 for depth to groundwater. Groundwater was gauged at 13.81 (MW-2), 24.64 (TMW-1), and 26.53 (TMW-2) feet below top of casing (TOC). Groundwater potentiometric surface elevation ranged from 3,555.71 feet above mean sea level (MSL) at MW-2 (up gradient) to 3,537.94 feet above MSL at TMW-2 (down gradient). Groundwater flow was from northwest to southeast at a gradient of about 0.0266 ft/ft. No significant changes in groundwater flow direction or gradient was observed on December 12, 2022, compared to the previous monitoring event on August 15, 2022. Figure 4 presents the potentiometric surface map for December 12, 2022.

### 3.2 Groundwater Samples and Laboratory Analysis

On December 12, 2022, LAI personnel collected groundwater samples from monitoring wells MW-2, TMW-1, and TMW-2 using the low stress or low flow method according to EPA protocol (EQASOP-GW4, Revision 4, September 19, 2017) where an environmental pump is submerged near the middle of the water column and the well is pumped at a low rate until environmental parameters stabilize.

Groundwater samples were collected from the discharge of the dedicated disposable Tygon® tubing. The 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. Quality assurance and quality control (duplicate) samples were collected from MW-2. The samples were carefully transferred to laboratory containers that were labeled, packed in an ice filled chest affixed with custody seals, and delivered under chain of custody control to Xenco-Eurofins Laboratories (Xenco-Eurofins), a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory, located in Midland, Texas. Xenco-Eurofins analyzed the samples for benzene, toluene, ethylbenzene, xylene (BTEX) according to EPA SW-846 Method SW-8021B and chloride by EPA Method 300, respectively. Table 2 presents the laboratory analytical data summary. Appendix D presents the laboratory report.

#### 3.2.1 Organic Analysis

All BTEX values were below the SW-846 – 8021B analytical method reporting limits (RL) and NMWQCC human health standards. No data quality exceptions were noted in the Xenco case narratives. The results are consistent with the results from previous groundwater monitoring events. Figure 5 presents the benzene concentration in groundwater map.

#### 3.2.2 Inorganic Analysis

Chloride concentrations remain above the NMWQCC domestic water quality standard (250 mg/L) in samples collected from downgradient wells TMW-1 (358 mg/L) and TMW-2 (338 mg/L). The chloride concentration in well MW-2 (223 mg/L) is representative of the background chloride concentration and is below the NMWQCC domestic water quality standard (250 mg/L). The duplicate (QA/QC) sample (Dup-1) collected from MW-2 is within ten (10) percent (221 mg/L) of the original chloride value (223 mg/L) for

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MW-2. No data quality exceptions were noted in the Xenco-Eurofins case narratives. Figure 6 presents the groundwater chloride concentration map. Figure 7 presents the chloride concentration control chart.

## **4.0 CONCLUSIONS**

The following observations are documented in this report:

- Monitoring well MW-2 remains hydraulically up gradient and representative of background chloride in groundwater.
- BTEX was reported below the analytical method RL and NMWQCC human health standards in wells MW-2, TMW-1, and TMW-2.
- Chloride exceeded the NMWQCC domestic water quality standard of 250 mg/L in samples collected from TMW-1 (358 mg/L) and TMW-2 (338 mg/L).
- Chloride concentrations remained below the NMWQCC domestic water quality standard of 250 mg/L in the sample collected from MW-2.

## **6.0 RECOMMENDATIONS**

Apache proposes the following modifications to the groundwater monitoring program:

- Reduce frequency of groundwater monitoring from quarterly (4 times per year) to semi-annually (2 times per year) during 2023.
- Collect depth to groundwater and groundwater samples from all monitoring wells during each semi-annual event.
- Report the laboratory results to NMOCD in semi-annual 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**  
**Monitor Well Completion and Gauging Summary**  
**Apache Corporation, NMGSAU 2102**  
**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-2	Unknown	62.91	60.03	2	3566.64	Unknown	2.88	3,569.52	03/12/2020	13.59	10.71	49.32	3,555.93
									07/20/2020	13.75	10.87	49.16	3,555.77
									10/01/2020	13.90	11.02	49.01	3,555.62
									12/08/2020	13.81	10.93	49.10	3,555.71
									03/10/2021	13.80	10.92	49.11	3,555.72
									06/11/2021	13.80	10.92	49.11	3,555.72
									10/12/2021	13.81	10.93	49.10	3,555.71
									12/21/2021	13.76	10.88	49.15	3,555.76
									08/15/2022	13.95	11.07	48.96	3,555.57
									12/12/2022	13.81	10.93	49.10	3,555.71
TMW-1	3/11/2020	36.23	33.33	2	3561.92	9.83 - 29.49	2.90	3,564.82	03/12/2020	24.37	21.47	11.86	3,540.45
									07/20/2020	24.95	22.05	11.28	3,539.87
									10/01/2020	24.90	22.00	11.33	3,539.92
									12/08/2020	24.65	21.75	11.58	3,540.17
									03/10/2021	24.60	21.70	11.63	3,540.22
									06/11/2021	24.80	21.9	11.43	3,540.02
									10/12/2021	24.96	22.06	11.27	3,539.86
									12/21/2021	24.64	21.74	11.59	3,540.18
									08/15/2022	25.45	22.55	10.78	3,539.37
									12/12/2022	24.64	21.74	11.59	3,540.18
TWM-2	3/11/2020	37.07	34.03	2	3561.43	10.05 - 29.30	3.04	3,564.47	03/12/2020	26.38	23.34	10.69	3,538.09
									07/20/2020	26.70	23.66	10.37	3,537.77
									10/01/2020	26.70	23.66	10.37	3,537.77
									12/08/2020	26.51	23.47	10.56	3,537.96
									03/10/2021	26.40	23.36	10.67	3,538.07
									06/11/2021	26.57	23.53	10.50	3,537.90
									10/12/2021	26.72	23.68	10.35	3,537.75
									12/21/2021	26.49	23.45	10.58	3,537.98

**Table 1**  
**Monitor Well Completion and Gauging Summary**  
**Apache Corporation, NMGSAU 2102**  
**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)
									08/15/2022	27.01	23.97	10.06	3,537.46
									12/12/2022	26.53	23.49	10.54	3,537.94

Notes: MW-2 is hydraulically upgradient. TMW-1 is near release source. TMW-2 is hydraulically down gradient.

bgs: below ground surface

TOC: top of casing

AMSL: elevation above mean sea level

**Table 2**  
**Groundwater Sample Analytical Data Summary**  
**Apache Corporation, NMGSAU 2102**  
**Lea County, New Mexico**

Sample	Collection Date	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Xylenes (mg/L)	Chloride (mg/L)
WQCC Standard:		*0.005	* 1	*0.7	*0.62	**250
MW-2	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	230
	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	231
	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	241
	12/08/2020	<0.00200	<0.00200	<0.00200	<0.00200	227
	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	235
	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	212
	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	207
	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	222
	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	232
	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	223
TMW-1	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	360
	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	432
	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	452
	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00200	449
	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	418
	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	361
	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	291
	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	406
	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	306
	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	358
TMW-2	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	423
	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	664
	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	591
	12/08/2020	<0.00200	<0.00200	<0.00200	<0.00200	473
	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	428
	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	402
	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	325
	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	388
	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	362
	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	338
QA/QC (Duplicate) Samples						
DUP-1 (MW-2)	03/12/2020	<0.00100	<0.00100	<0.00100	<0.00300	223

**Table 2**  
**Groundwater Sample Analytical Data Summary**  
**Apache Corporation, NMGSAU 2102**  
**Lea County, New Mexico**

DUP-1 (MW-2)	07/20/2020	<0.00200	<0.00200	<0.00200	<0.00600	242
DUP-1 (MW-2)	10/01/2020	<0.00200	<0.00200	<0.00200	<0.00200	245
DUP-1 (MW-2)	12/08/2020	<0.00200	<0.00200	<0.00200	<0.00200	226
DUP-1 (MW-2)	03/10/2021	<0.00200	<0.00200	<0.00200	<0.00200	237
DUP-1 (MW-2)	06/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	213
DUP-1 (MW-2)	10/12/2021	<0.00200	<0.00200	<0.00200	<0.00400	305
DUP-1 (MW-2)	12/21/2021	<0.00200	<0.00200	<0.00200	<0.00400	226
DUP-1 (MW-2)	08/15/2022	<0.00200	<0.00200	<0.00200	<0.00400	254
DUP-1 (MW-2)	12/12/2022	<0.00200	<0.00200	<0.00200	<0.00400	221

## 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**

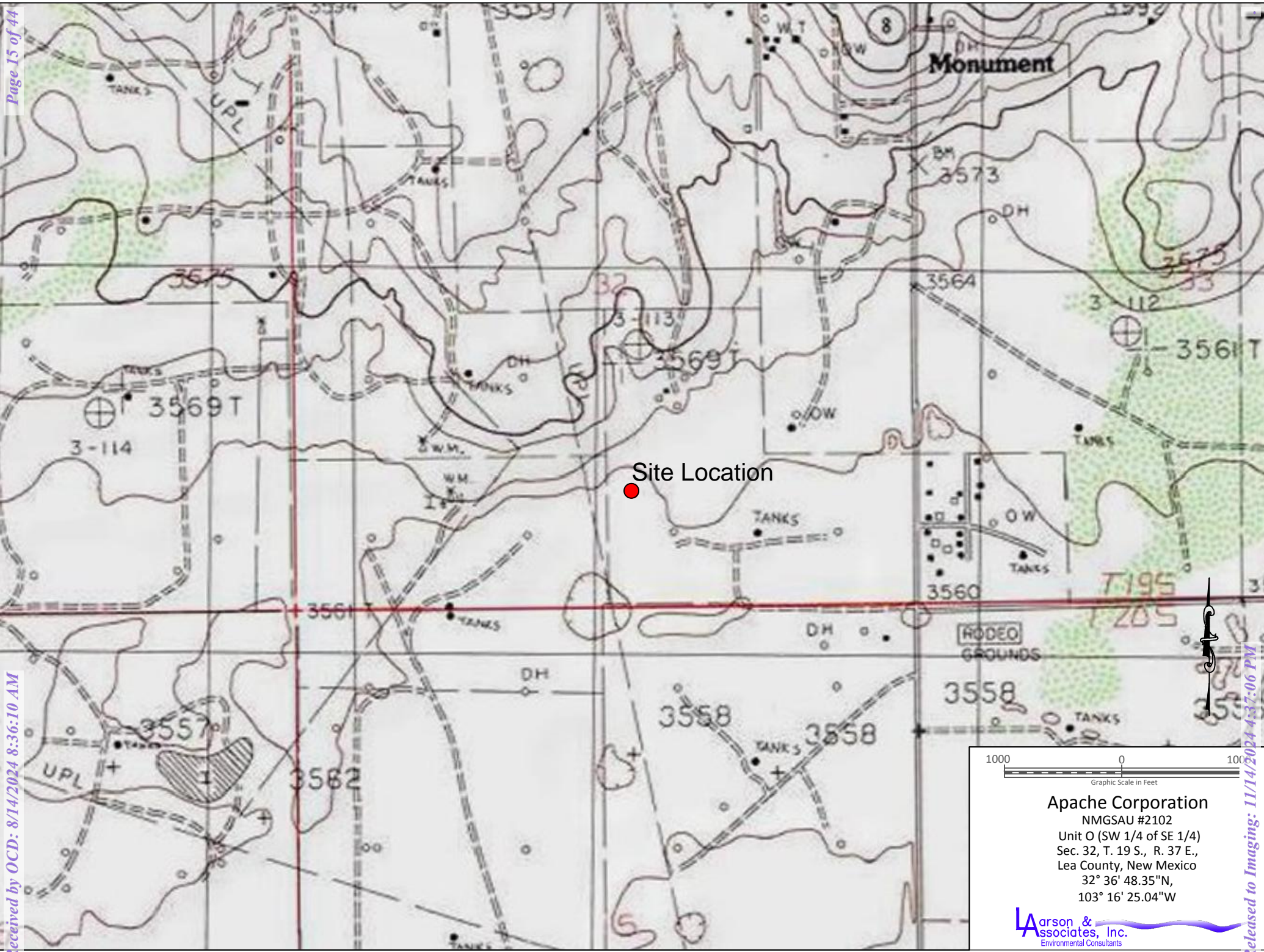


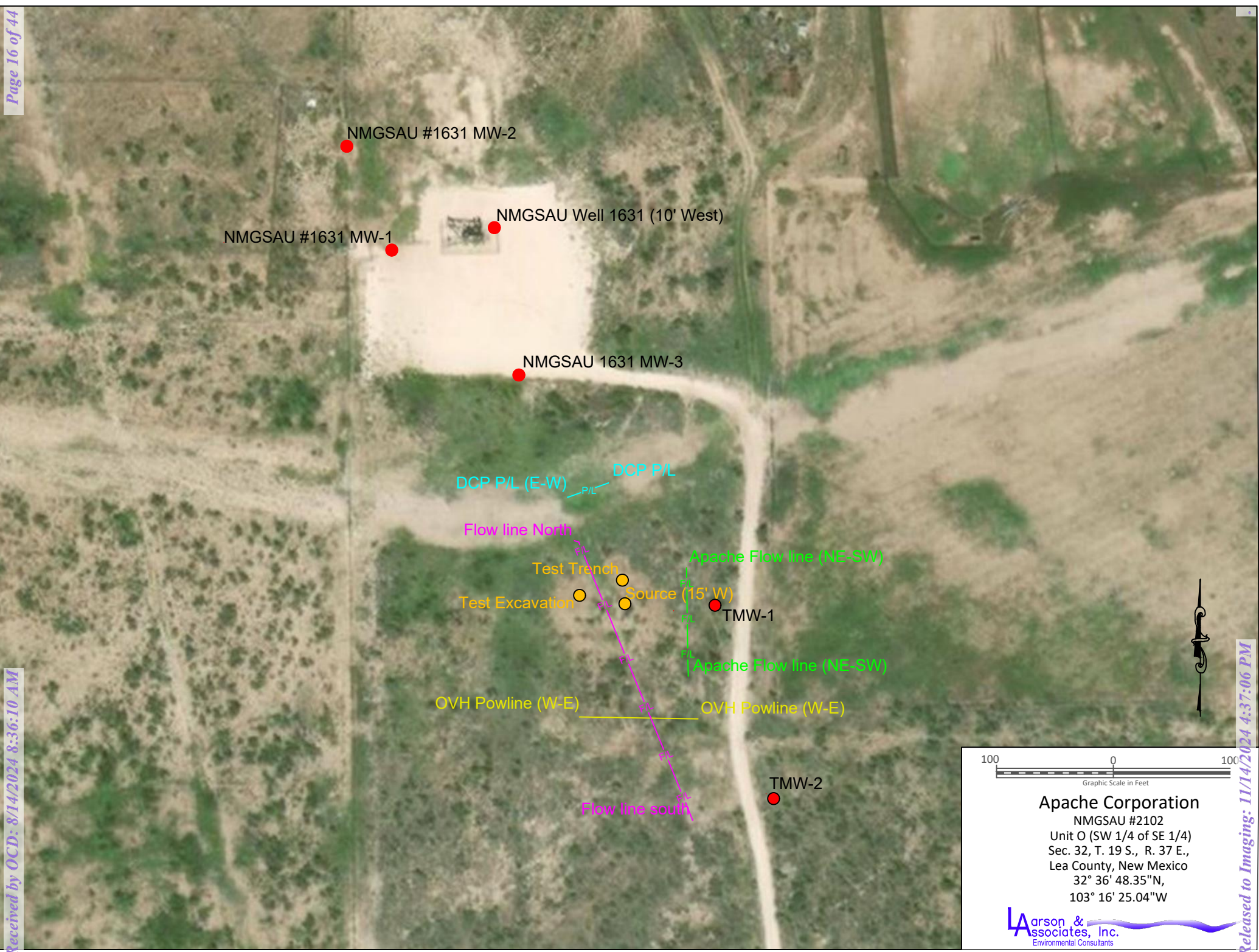
Figure 1 - Topographic Map

Apache Corporation  
NMGSAU #2102  
Unit O (SW 1/4 of SE 1/4)  
Sec. 32, T. 19 S., R. 37 E.,  
Lea County, New Mexico  
32° 36' 48.35"N,  
103° 16' 25.04"W

**L**arson &  
Associates, Inc.  
Environmental Consultants



Figure 2 - Aerial Map





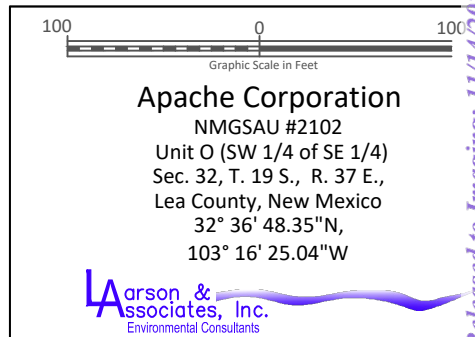
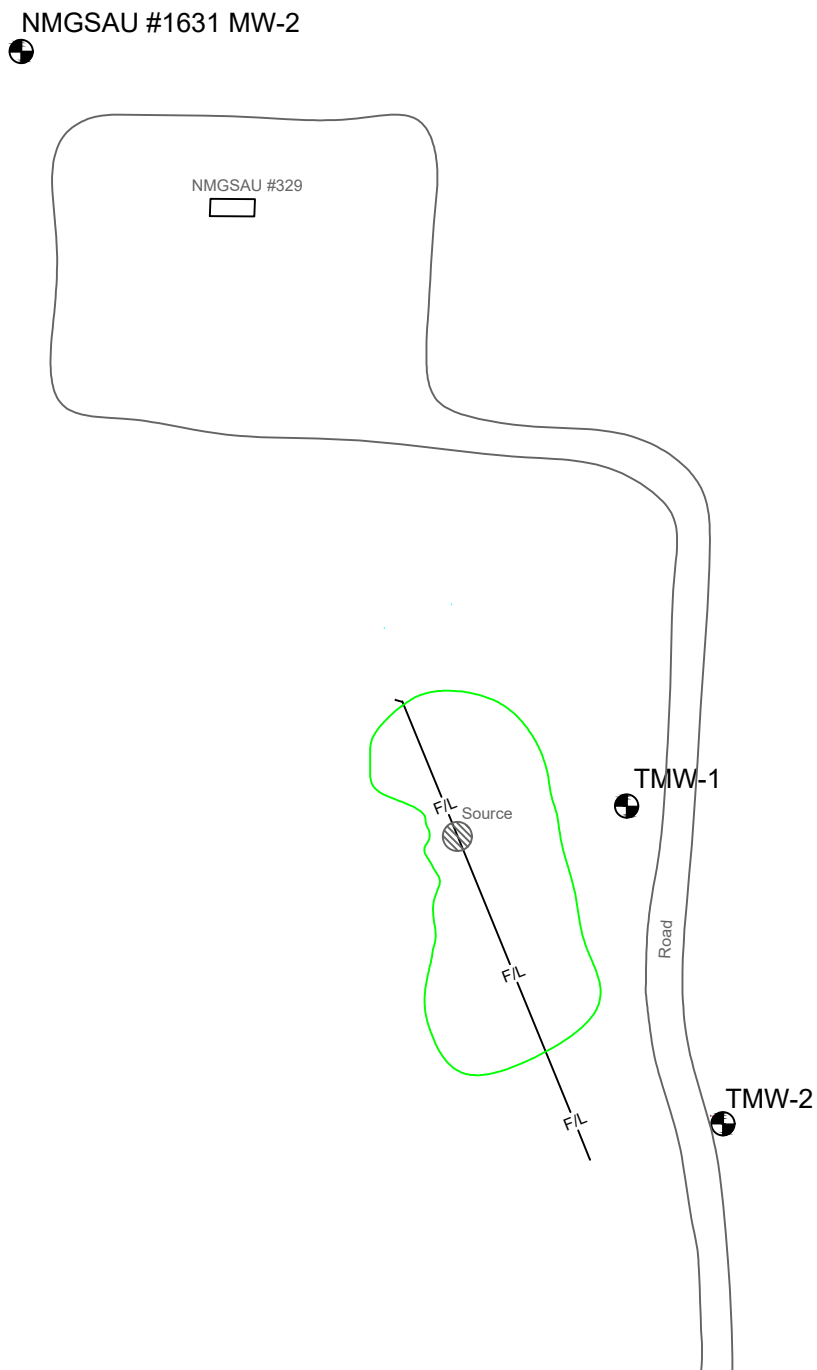


Figure 3 - Base Map

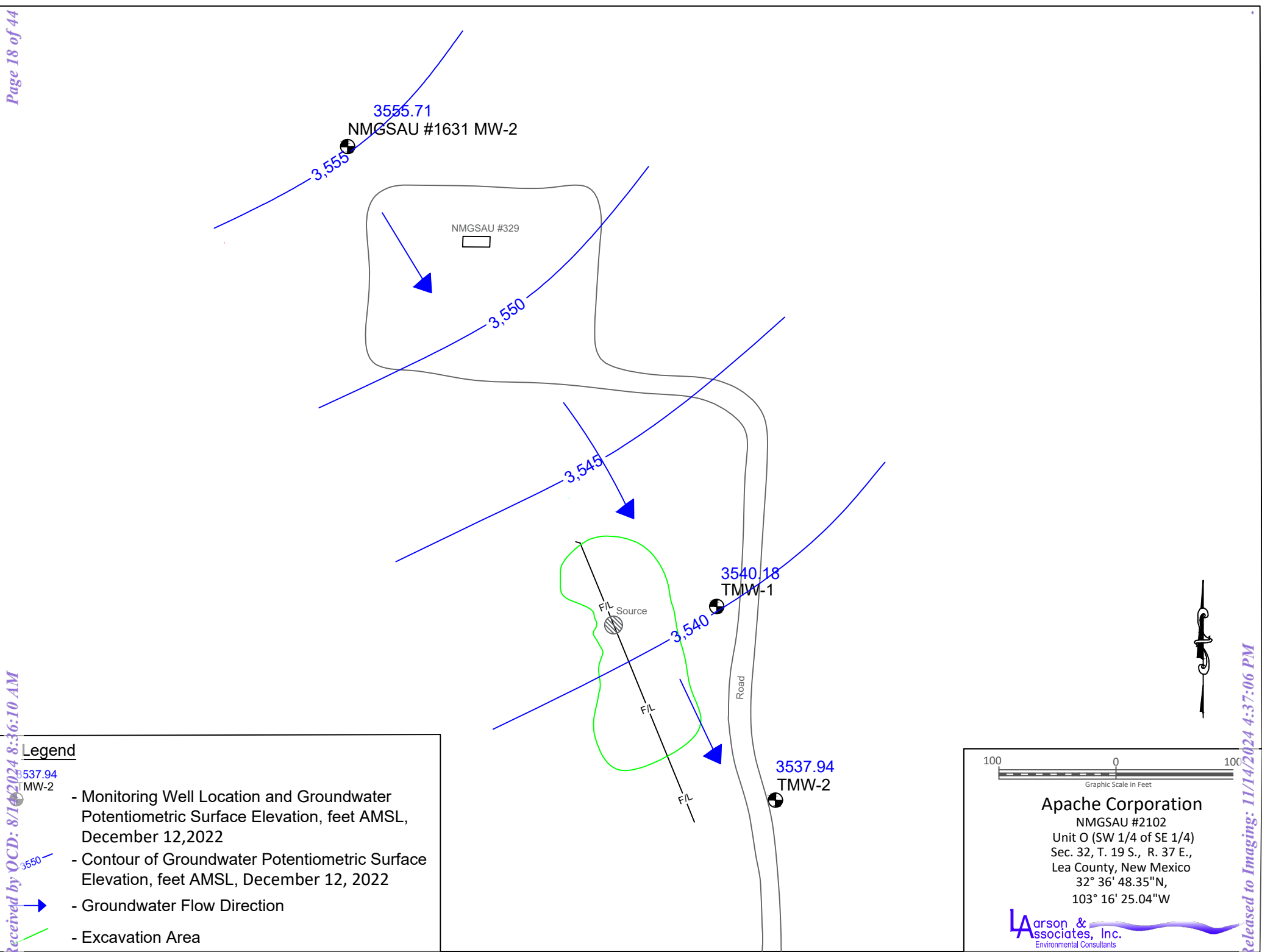


Figure 4 - Groundwater Potentiometric Surface Map, December 12, 2022

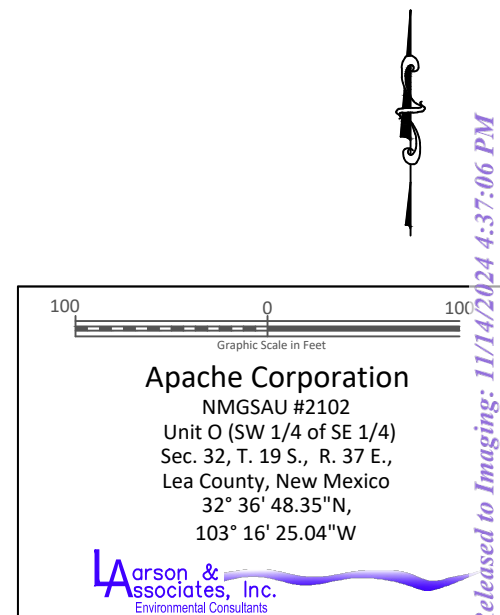
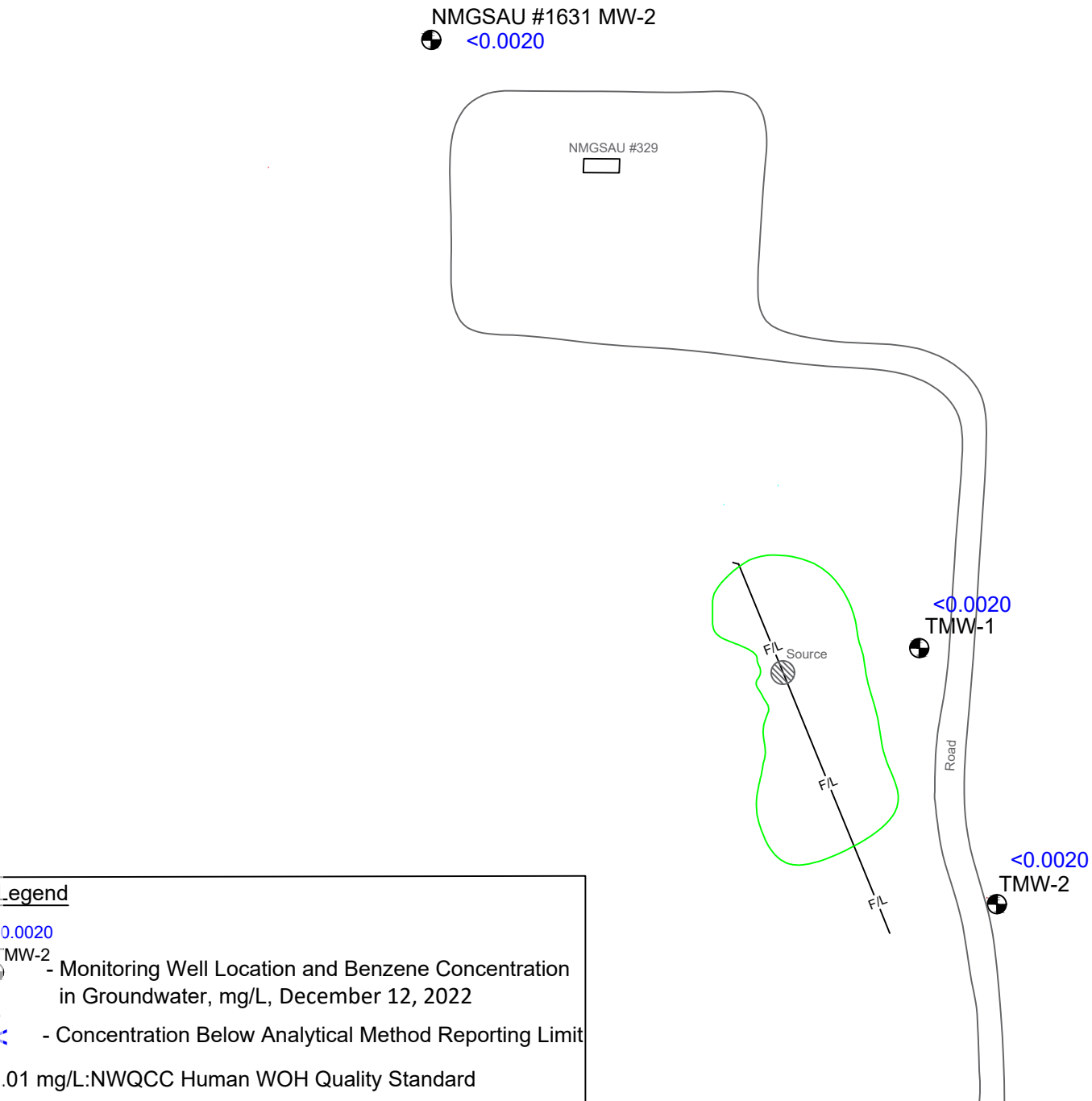
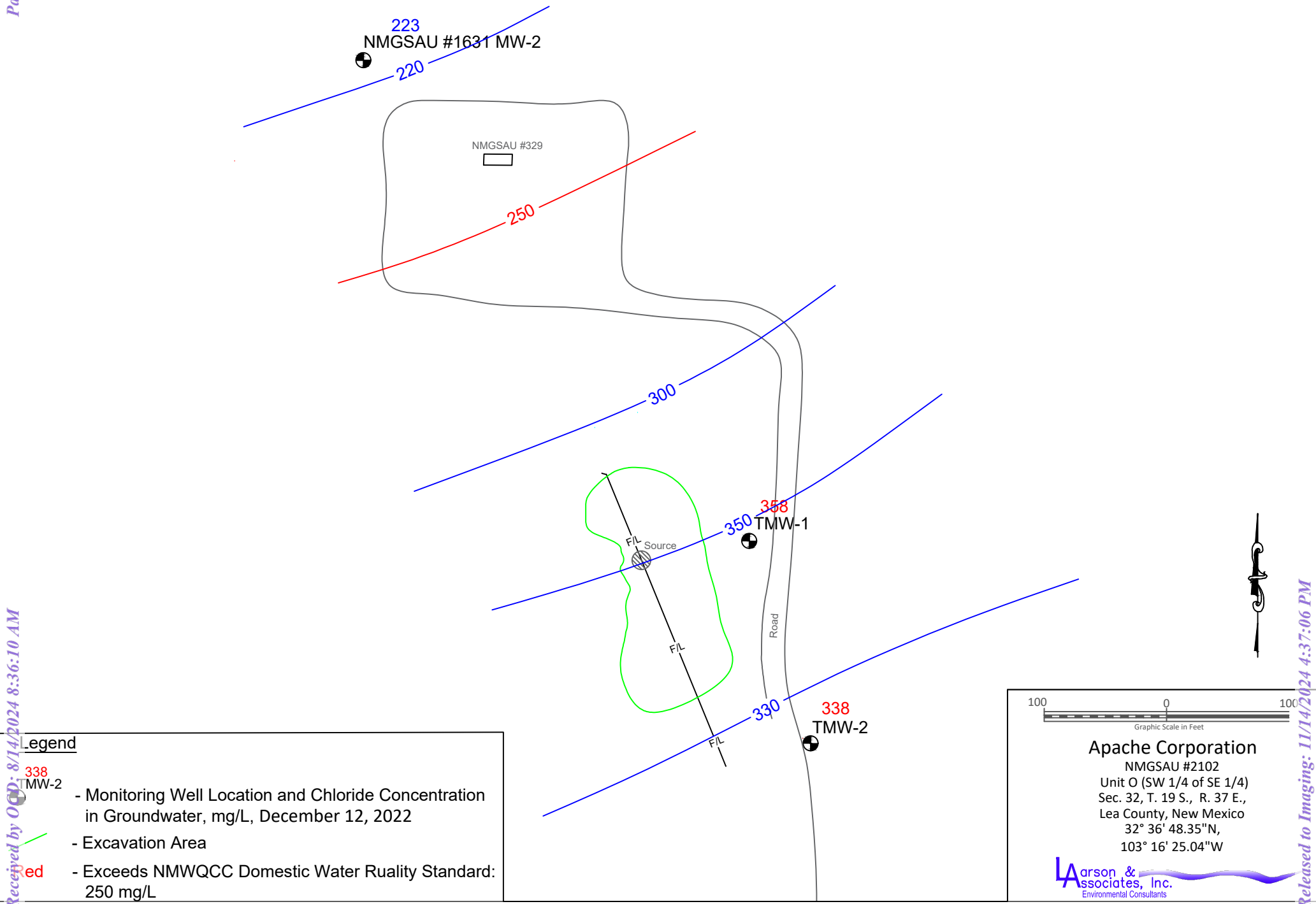


Figure 5 - Benzene Concentration in Groundwater Map, December 12, 2022

Figure 6 - Chloride Concentration in Groundwater Map, December 12, 2022



**Appendix A**  
**Karst Risk Potential Map**





Browser

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📁 L:\

📁 Z:\

📦 GeoPackage

📁 Spatialite

🗺️ PostGIS

🗺️ MSSQL

🗺️ Oracle

🗺️ DB2

🌐 WMS/WMTS

🌐 XYZ Tiles

🌐 WCS

🌐 WFS / OGC API - Features

🌐 OWS

🌐 ArcGisMapServer

🌐 ArcGisFeatureServer

🌐 GeoNode

Layers

✓ **Added geom info**

✓ **carlsbad\_west**

✓ **Karst\_or\_No\_Karst**

✓ High

✓ Low

✓ Medium

✓ **Bing Satellite**



## **Appendix B**

### **Boring Logs**



## BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: 10:29 Finish: 11:45 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	Surface Elevation: TOC Elevation:		NUMBER	RECOVERY	DEPTH	REMARKS
										BACKGROUND PID READING
	0	Sand, 7.5YR, 6/5 to 6/4, Well Sorted, Very Fine Grained Quartz Sand, Light Brown	ML							SOIL : _____ PPM SOIL : _____ PPM
	5	Caliche, 7.5YR, 8/3, Pink, 2-10mm Subangular Clast Inclusions, Fine Grained	Caliche							
	10	Silty Sand, 7.5YR, 8/4, Pink, Moderately Sorted with Subangular 1-6mm Clast Inclusions								
	15	7.5YR, 8/6, Reddish Yellow, Moderately Sorted with Subangular 2-6mm Clast Inclusions	ML							
	20									
	25									
	30	TD: 30'								

☐ 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 )  
☐ NO RECOVERY

JOB NUMBER : 19-0112-51 / Apache Corp.

HOLE DIAMETER : 2"

LOCATION : NMGSAU 2102

LAI GEOLOGIST : R. Nelson

DRILLING CONTRACTOR : SDI

DRILLING METHOD : Air Rotary

Larson & Associates, Inc.  
 Environmental Consultants

DRILL DATE :  
 03-11-2020

BORING NUMBER :  
 TMW-1



## BORING RECORD

GEOLOGIC UNIT	DEPTH	Start: 12:36 Finish: 1:09 DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	Surface Elevation: TOC Elevation:		NUMBER	RECOVERY	DEPTH	REMARKS
										BACKGROUND PID READING
	0	Sand, 7.5YR, 6/5 to 6/4, Well Sorted, Very Fine Quartz Grained Sand, Light Brown	ML							SOIL : _____ PPM SOIL : _____ PPM
	5	Caliche, 7.5YR, 8/3, Pink, 2-10mm Subangular Clast Inclusions, Fine Grained	Caliche							
	10	Silty Sand, 7.5YR, 8/4, Pink, Moderately Sorted with Subangular 1-6mm Clast Inclusions			8.05					
	15	7.5YR, 8/6, Reddish Yellow, Moderately Sorted with Subangular 2-6mm Clast Inclusions	ML		10.05					
	20									
	25									
	30	TD: 30'			29.30 29.73 30.00					

☐ 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 )

☐ NO RECOVERY

JOB NUMBER : 19-0112-51 / Apache Corp.

HOLE DIAMETER : 2"

LOCATION : NMGSAU 2102

LAI GEOLOGIST : R. Nelson

DRILLING CONTRACTOR : SDI

DRILLING METHOD : Air Rotary

**Larson & Associates, Inc.**  
Environmental Consultants

DRILL DATE :  
03-11-2020

BORING NUMBER :  
TMW-2

## **Appendix C**

### **Laboratory Reports**



Environment Testing

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# ANALYTICAL REPORT

## PREPARED FOR

Attn: Mr. Mark J Larson  
Larson & Associates, Inc.  
507 N Marienfeld  
Suite 202  
Midland, Texas 79701

Generated 12/23/2022 9:48:46 PM

## JOB DESCRIPTION

NMGSAU 2102  
SDG NUMBER 19-0112-51

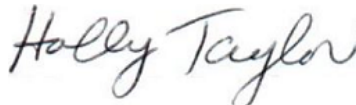
## JOB NUMBER

880-22622-1

Eurofins Midland  
1211 W. Florida Ave  
Midland TX 79701

**Eurofins Midland****Job Notes**

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

**Authorization**

Generated  
12/23/2022 9:48:46 PM

Authorized for release by  
Holly Taylor, Project Manager  
[Holly.Taylor@et.eurofinsus.com](mailto:Holly.Taylor@et.eurofinsus.com)  
(806)794-1296

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Laboratory Job ID: 880-22622-1  
SDG: 19-0112-51

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## Definitions/Glossary

Client: Larson & Associates, Inc.  
Project/Site: NMGS AU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

## 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.

## 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
SQL	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: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Job ID: 880-22622-1

Laboratory: Eurofins Midland

Narrative	
	Job Narrative 880-22622-1

Receipt

The samples were received on 12/13/2022 9:28 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 5.3°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.

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## Client Sample Results

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Client Sample ID: MW-2

Lab Sample ID: 880-22622-1

Date Collected: 12/12/22 09:53

Matrix: Water

Date Received: 12/13/22 09:28

## Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200	mg/L			12/23/22 08:02	1
Toluene	<0.00200	U	0.00200	mg/L			12/23/22 08:02	1
Ethylbenzene	<0.00200	U	0.00200	mg/L			12/23/22 08:02	1
m,p-Xylenes	<0.00400	U	0.00400	mg/L			12/23/22 08:02	1
o-Xylene	<0.00200	U	0.00200	mg/L			12/23/22 08:02	1
Xylenes, Total	<0.00400	U	0.00400	mg/L			12/23/22 08:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		70 - 130		12/23/22 08:02	1
1,4-Difluorobenzene (Surr)	105		70 - 130		12/23/22 08:02	1

## Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			12/23/22 17:06	1

## Method: MCAWW 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	223		2.50	mg/L			12/17/22 00:11	5

Client Sample ID: TMW-1

Lab Sample ID: 880-22622-2

Date Collected: 12/12/22 10:47

Matrix: Water

Date Received: 12/13/22 09:28

## Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200	mg/L			12/23/22 08:23	1
Toluene	<0.00200	U	0.00200	mg/L			12/23/22 08:23	1
Ethylbenzene	<0.00200	U	0.00200	mg/L			12/23/22 08:23	1
m,p-Xylenes	<0.00400	U	0.00400	mg/L			12/23/22 08:23	1
o-Xylene	<0.00200	U	0.00200	mg/L			12/23/22 08:23	1
Xylenes, Total	<0.00400	U	0.00400	mg/L			12/23/22 08:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		70 - 130		12/23/22 08:23	1
1,4-Difluorobenzene (Surr)	110		70 - 130		12/23/22 08:23	1

## Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			12/23/22 17:06	1

## Method: MCAWW 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	358		5.00	mg/L			12/17/22 00:18	10

Client Sample ID: TMW-2

Lab Sample ID: 880-22622-3

Date Collected: 12/12/22 10:57

Matrix: Water

Date Received: 12/13/22 09:28

## Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200	mg/L			12/23/22 08:43	1
Toluene	<0.00200	U	0.00200	mg/L			12/23/22 08:43	1

Eurofins Midland



## Client Sample Results

Client: Larson & Associates, Inc.  
Project/Site: NMGS AU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Client Sample ID: TMW-2

Lab Sample ID: 880-22622-3

Date Collected: 12/12/22 10:57

Matrix: Water

Date Received: 12/13/22 09:28

## Method: SW846 8021B - Volatile Organic Compounds (GC) (Continued)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	<0.00200	U	0.00200	mg/L			12/23/22 08:43	1
m,p-Xylenes	<0.00400	U	0.00400	mg/L			12/23/22 08:43	1
o-Xylene	<0.00200	U	0.00200	mg/L			12/23/22 08:43	1
Xylenes, Total	<0.00400	U	0.00400	mg/L			12/23/22 08:43	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		70 - 130				12/23/22 08:43	1
1,4-Difluorobenzene (Surr)	106		70 - 130				12/23/22 08:43	1

## Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			12/23/22 17:06	1

## Method: MCAWW 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	338		5.00	mg/L			12/17/22 00:26	10

Client Sample ID: Dup-1

Lab Sample ID: 880-22622-4

Date Collected: 12/12/22 00:00

Matrix: Water

Date Received: 12/13/22 09:28

## Method: SW846 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200	mg/L			12/23/22 09:04	1
Toluene	<0.00200	U	0.00200	mg/L			12/23/22 09:04	1
Ethylbenzene	<0.00200	U	0.00200	mg/L			12/23/22 09:04	1
m,p-Xylenes	<0.00400	U	0.00400	mg/L			12/23/22 09:04	1
o-Xylene	<0.00200	U	0.00200	mg/L			12/23/22 09:04	1
Xylenes, Total	<0.00400	U	0.00400	mg/L			12/23/22 09:04	1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	91		70 - 130				12/23/22 09:04	1
1,4-Difluorobenzene (Surr)	108		70 - 130				12/23/22 09:04	1

## Method: TAL SOP Total BTEX - Total BTEX Calculation

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Total BTEX	<0.00400	U	0.00400	mg/L			12/23/22 17:06	1

## Method: MCAWW 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	221		2.50	mg/L			12/17/22 00:33	5

Eurofins Midland

Surrogate Summary

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Method: 8021B - Volatile Organic Compounds (GC)  
Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	BFB1	DFBZ1
		(70-130)	(70-130)
880-22622-1	MW-2	92	105
880-22622-2	TMW-1	93	110
880-22622-3	TMW-2	90	106
880-22622-4	Dup-1	91	108
LCS 880-42368/96	Lab Control Sample	86	110
LCSD 880-42368/97	Lab Control Sample Dup	87	110
MB 880-42368/101	Method Blank	82	105
MB 880-42379/5-A	Method Blank	85	105
Surrogate Legend			
BFB = 4-Bromofluorobenzene (Surr)			
DFBZ = 1,4-Difluorobenzene (Surr)			

## QC Sample Results

Client: Larson & Associates, Inc.  
Project/Site: NMGS AU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

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

Lab Sample ID: MB 880-42368/101

Matrix: Water

Analysis Batch: 42368

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			12/23/22 00:36	1
Toluene	<0.00200	U	0.00200	mg/L			12/23/22 00:36	1
Ethylbenzene	<0.00200	U	0.00200	mg/L			12/23/22 00:36	1
m,p-Xylenes	<0.00400	U	0.00400	mg/L			12/23/22 00:36	1
o-Xylene	<0.00200	U	0.00200	mg/L			12/23/22 00:36	1
Xylenes, Total	<0.00400	U	0.00400	mg/L			12/23/22 00:36	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	82		70 - 130		12/23/22 00:36	1
1,4-Difluorobenzene (Surr)	105		70 - 130		12/23/22 00:36	1

Lab Sample ID: LCS 880-42368/96

Matrix: Water

Analysis Batch: 42368

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	0.1262		mg/L		126	70 - 130
Toluene	0.100	0.1009		mg/L		101	70 - 130
Ethylbenzene	0.100	0.09059		mg/L		91	70 - 130
m,p-Xylenes	0.200	0.1776		mg/L		89	70 - 130
o-Xylene	0.100	0.08490		mg/L		85	70 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	86		70 - 130
1,4-Difluorobenzene (Surr)	110		70 - 130

Lab Sample ID: LCSD 880-42368/97

Matrix: Water

Analysis Batch: 42368

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	0.1208		mg/L		121	70 - 130	4	20
Toluene	0.100	0.09653		mg/L		97	70 - 130	4	20
Ethylbenzene	0.100	0.08804		mg/L		88	70 - 130	3	20
m,p-Xylenes	0.200	0.1730		mg/L		87	70 - 130	3	20
o-Xylene	0.100	0.08259		mg/L		83	70 - 130	3	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	87		70 - 130
1,4-Difluorobenzene (Surr)	110		70 - 130

Lab Sample ID: MB 880-42379/5-A

Matrix: Water

Analysis Batch: 42368

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 42379

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<0.00200	U	0.00200	mg/L		12/21/22 09:42	12/22/22 12:23	1
Toluene	<0.00200	U	0.00200	mg/L		12/21/22 09:42	12/22/22 12:23	1

Eurofins Midland

## QC Sample Results

Client: Larson & Associates, Inc.  
Project/Site: NMGS AU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

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

Lab Sample ID: MB 880-42379/5-A

Matrix: Water

Analysis Batch: 42368

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 42379

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ethylbenzene	<0.00200	U	0.00200	mg/L		12/21/22 09:42	12/22/22 12:23	1
m,p-Xylenes	<0.00400	U	0.00400	mg/L		12/21/22 09:42	12/22/22 12:23	1
o-Xylene	<0.00200	U	0.00200	mg/L		12/21/22 09:42	12/22/22 12:23	1
Xylenes, Total	<0.00400	U	0.00400	mg/L		12/21/22 09:42	12/22/22 12:23	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	85		70 - 130	12/21/22 09:42	12/22/22 12:23	1
1,4-Difluorobenzene (Surr)	105		70 - 130	12/21/22 09:42	12/22/22 12:23	1

## Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 880-42064/3

Matrix: Water

Analysis Batch: 42064

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			12/16/22 22:45	1

Lab Sample ID: LCS 880-42064/4

Matrix: Water

Analysis Batch: 42064

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	25.03		mg/L		100	90 - 110

Lab Sample ID: LCSD 880-42064/5

Matrix: Water

Analysis Batch: 42064

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	25.11		mg/L		100	90 - 110	0	20

## QC Association Summary

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

## GC VOA

## Analysis Batch: 42368

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-22622-1	MW-2	Total/NA	Water	8021B	42379
880-22622-2	TMW-1	Total/NA	Water	8021B	
880-22622-3	TMW-2	Total/NA	Water	8021B	
880-22622-4	Dup-1	Total/NA	Water	8021B	
MB 880-42368/101	Method Blank	Total/NA	Water	8021B	
MB 880-42379/5-A	Method Blank	Total/NA	Water	8021B	
LCS 880-42368/96	Lab Control Sample	Total/NA	Water	8021B	
LCSD 880-42368/97	Lab Control Sample Dup	Total/NA	Water	8021B	

## Prep Batch: 42379

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 880-42379/5-A	Method Blank	Total/NA	Water	5035	

## Analysis Batch: 42573

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-22622-1	MW-2	Total/NA	Water	Total BTEX	
880-22622-2	TMW-1	Total/NA	Water	Total BTEX	
880-22622-3	TMW-2	Total/NA	Water	Total BTEX	
880-22622-4	Dup-1	Total/NA	Water	Total BTEX	

## HPLC/IC

## Analysis Batch: 42064

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-22622-1	MW-2	Total/NA	Water	300.0	
880-22622-2	TMW-1	Total/NA	Water	300.0	
880-22622-3	TMW-2	Total/NA	Water	300.0	
880-22622-4	Dup-1	Total/NA	Water	300.0	
MB 880-42064/3	Method Blank	Total/NA	Water	300.0	
LCS 880-42064/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 880-42064/5	Lab Control Sample Dup	Total/NA	Water	300.0	

Lab Chronicle

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Client Sample ID: MW-2  
Date Collected: 12/12/22 09:53  
Date Received: 12/13/22 09:28

Lab Sample ID: 880-22622-1  
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	42368	12/23/22 08:02	SM	EET MID
Total/NA	Analysis	Total BTEX		1			42573	12/23/22 17:06	AJ	EET MID
Total/NA	Analysis	300.0		5	50 mL	50 mL	42064	12/17/22 00:11	CH	EET MID

Client Sample ID: TMW-1  
Date Collected: 12/12/22 10:47  
Date Received: 12/13/22 09:28

Lab Sample ID: 880-22622-2  
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	42368	12/23/22 08:23	SM	EET MID
Total/NA	Analysis	Total BTEX		1			42573	12/23/22 17:06	AJ	EET MID
Total/NA	Analysis	300.0		10	50 mL	50 mL	42064	12/17/22 00:18	CH	EET MID

Client Sample ID: TMW-2  
Date Collected: 12/12/22 10:57  
Date Received: 12/13/22 09:28

Lab Sample ID: 880-22622-3  
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	42368	12/23/22 08:43	SM	EET MID
Total/NA	Analysis	Total BTEX		1			42573	12/23/22 17:06	AJ	EET MID
Total/NA	Analysis	300.0		10	50 mL	50 mL	42064	12/17/22 00:26	CH	EET MID

Client Sample ID: Dup-1  
Date Collected: 12/12/22 00:00  
Date Received: 12/13/22 09:28

Lab Sample ID: 880-22622-4  
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	42368	12/23/22 09:04	SM	EET MID
Total/NA	Analysis	Total BTEX		1			42573	12/23/22 17:06	AJ	EET MID
Total/NA	Analysis	300.0		5	50 mL	50 mL	42064	12/17/22 00:33	CH	EET MID

Laboratory References:  
EET MID = Eurofins Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440

Accreditation/Certification Summary

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Laboratory: Eurofins Midland

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

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704400-22-25	06-30-23

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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Method Summary

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Method	Method Description	Protocol	Laboratory
8021B	Volatile Organic Compounds (GC)	SW846	EET MID
Total BTEX	Total BTEX Calculation	TAL SOP	EET MID
300.0	Anions, Ion Chromatography	MCAWW	EET MID
5030B	Purge and Trap	SW846	EET MID

**Protocol References:**

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

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:**

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



Sample Summary

Client: Larson & Associates, Inc.  
Project/Site: NMGSAU 2102

Job ID: 880-22622-1  
SDG: 19-0112-51

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
880-22622-1	MW-2	Water	12/12/22 09:53	12/13/22 09:28
880-22622-2	TMW-1	Water	12/12/22 10:47	12/13/22 09:28
880-22622-3	TMW-2	Water	12/12/22 10:57	12/13/22 09:28
880-22622-4	Dup-1	Water	12/12/22 00:00	12/13/22 09:28

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

12/23/2022

## Login Sample Receipt Checklist

Client: Larson &amp; Associates, Inc.

Job Number: 880-22622-1

SDG Number: 19-0112-51

Login Number: 22622

List Number: 1

Creator: Rodriguez, Leticia

List Source: Eurofins 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	

Sante Fe Main Office  
Phone: (505) 476-3441

General Information  
Phone: (505) 629-6116

Online Phone Directory  
<https://www.emnrd.nm.gov/oed/contact-us>

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

CONDITIONS

Action 373663

CONDITIONS

Operator:  APACHE CORPORATION 303 Veterans Airpark Ln Midland, TX 79705	OGRID:  873
	Action Number:  373663
	Action Type:  [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

CONDITIONS

Created By	Condition	Condition Date
michael.buchanan	NMGSAU 2102 2022 4th Quarter Groundwater Monitoring Report has been accepted as part of the incident file and for record. A completion and termination report also submitted for the site on 08/14/2024. App ID: 373663	11/14/2024