1RP-5636
Annual Groundwater Monitoring Report
(December 2019 to December 2020)

East Blinebry Drinkard Unit #37
Lea County, New Mexico

Latitude: N 32.47956°
Longitude: W -103.12206°

LAI Project No. 19-0112-49

December 23, 2020

Prepared for:
Apache Corporation
303 Veterans Airpark Lane
Midland, Texas 79705

Prepared by:
Larson & Associates, Inc.
507 North Marienfeld Street, Suite 202
Midland, Texas 79701

Mark J. Larson, P.G.
Certified Professional Geologist #10490

Daniel A. St. Germain
Staff Geologist

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Table of Contents

1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) has prepared this annual groundwater monitoring report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (OCD) District 1 in Hobbs and Santa Fe, New Mexico. This report presents quarterly (4 times per year) laboratory analysis of groundwater samples collected from monitor wells (TMW-1, TMW-2, TMW-3, TMW-4) and a windmill at the East Blinebry Drinkard Unit (EBDU) #37 (Site) located in Lea County, New Mexico. The geodetic position is North 32.479569° and West -103.122061°.

The following groundwater monitoring activities occurred between September 2019 and December 2020:

- **September 23, 2019**
  - Develop monitoring wells TMW-1 and TMW-2
  - Gauge depth to groundwater and collect groundwater samples from monitoring wells TMW-1 and TMW-2
- **December 26, 2019**
  - Gauge depth to groundwater and collect groundwater samples from monitoring wells TMW-1 and TMW-2
- **September 30, 2020**
  - Develop monitoring wells TWM-2 and TMW-3
  - Gauge depth to groundwater and collect groundwater samples from monitoring wells TMW-1 through TMW-4
- **December 7, 2020**
  - Gauge depth to groundwater and collect groundwater samples from monitoring wells TMW-1 through TMW-4

The following observations are documented in this report:

- No significant changes were observed in potentiometric surface elevation, flow direction, or gradient during the monitoring period.
- Two (2) monitoring wells (TMW-3 and TMW-4) were installed and developed on September 19 and 29, 2020, respectively.
- BTEX was not reported above the analytical method reporting limits (RL) or Ne Mexico Water Quality Control Commission (WQCC) human health standards in groundwater samples collected during 2019 and 2020 groundwater sampling events.
- Chloride was reported above the WQCC domestic water quality standard of 250 milligrams per liter (mg/L) in groundwater samples collected from wells TMW-2, TMW-4, and the windmill.
- TDS was reported above the WQCC domestic water quality standard of 1,000 mg/L in groundwater samples collected from wells TMW-2 and TMW-4.

Apache will continue quarterly monitoring of groundwater in wells TMW-1 through TWM-4 and the windmill during 2021 with laboratory analysis of groundwater samples for BTEX, chloride and TDS. Notice will be provided to OCD in Hobbs and Santa Fe, New Mexico at least 7 working days prior to each groundwater monitoring event. The OCD will be notified immediately upon receipt laboratory analysis with significant increase of analyte concentrations.

2.0 INTRODUCTION

Larson & Associates, Inc. (LAI), on behalf of Apache Corporation (Apache), has prepared this annual groundwater monitoring report for submittal to the New Mexico Oil Conservation Division (OCD) District 1 in Hobbs and Santa Fe, New Mexico. This report presents the quarterly (4 times pe year) collection and laboratory analysis of groundwater samples from four (4) monitor wells (TMW-1, TMW-2, TMW-3, TMW-4) and a windmill at East Blinebry Drinkard Unit (EBDU) #37 located in Lea County, New Mexico. The legal description is Unit E (SW/4, SW/4), Section 13, Township 21 South and Range 37 East. The geodetic position is North 32.479569° and West -103.122061°. Figure 1 presents a topographic map. Figure 2 presents an aerial map.

2.1 Background

The spill originated from a flowline at a pipeline junction located about 720 feet east from Well #37. Produced fluids (oil and produced water) flowed west about 350 feet west from the release origin, and south about 450 feet before terminating in low-lying area. The volume of the release and recovered fluid are unknown. The spill is designated as a major release due to the unknown volume of the release. The spill covered an area measuring about 31,320 square feet or about 0.72 acres. The initial C-141 was submitted on July 26, 2019 and was assigned remediation permit number 1RP-5636. Appendix A presents the initial C-141.

On October 29, 2019, Apache submitted to the OCD a remediation plan titled, "1RP-5636 REMEDIATION PLAN, East Blinebry Drinkard Unit #37 Produced water Spill, Lea County, New Mexico, October 29, 2019". On December 23, 2019, OCD approved an addendum to the remediation plan based on a telephone call on December 20, 2019, with the following conditions:

- Apache will install a boring in the bottom of the excavation to delineate the vertical extent of chloride in soil. Soil samples will be collected beginning at the bottom of the excavation and every five (5) feet thereafter until chloride decreases below 600 mg/Kg or groundwater is encountered.
- Apache will install two (2) additional monitoring wells at locations shown on the attached drawing. The monitoring wells will be constructed similar to monitoring well TMW-1 and TMW-2 with about 20 feet of screen placed above and below the groundwater level observed during drilling. Groundwater is expected to occur around 50 feet bgs therefore the borings will be advanced to around 70 feet bgs.
- Survey wells for top of elevation (top of casing and ground) for groundwater potentiometric surface elevation, flow direction and gradient.
- Apache will close the excavation at Area 1 according to the remediation plan dated October 29, 2019.
- Apache will close the excavation at Area 2, based on the laboratory results of samples from the boring to be placed in the bottom of the excavation, by filling the excavation to approximately 5 feet bgs with clean caliche, installing a 20-mill thickness polyethylene liner at approximately 5 feet bgs and backfilling to surface with clean topsoil.
- Seed Area 1 and Area 2 following remediation according to landowner requirement.
- Perform quarterly groundwater monitoring (5 wells) and reporting.

Appendix B presents the OCD communications.

2.2 Monitoring Well Installations

On September 29, 2019, Scarborough Drilling Inc. (SDI), under LAI supervision, installed two (2) monitoring wells (TMW-1 and TMW-2). Monitoring wells TMW-3 and TMW-4 were repositioned to avoid removing thick vegetation and/or crossing underground pipelines. Monitoring well TMW-3 was repositioned about 100 feet west from its original location. Monitoring well TMW-4 was repositioned about 30 feet east from its original location. OCD approved the relocation of the monitoring wells September 22, 2020. Appendix B presents OCD communications.

Monitoring wells TMW-3 and TMW-4 were drilled to approximately 68.41 feet bgs and 70.09 feet bgs, respectively. Both wells were completed with two (2) inch threaded schedule 40 PVC casing and approximately twenty (20) feet of 0.01-inch factory slotted screen. The screens were positioned above and below the groundwater level observed during drilling. Graded silica sand was placed around the well screens to about two (2) feet above the screens. The remaining annulus above the screens was filled to about 1-foot bgs with bentonite chips and hydrated with potable water. The wells are secured with locking steel covers.

The monitor wells (TMW-1 through TMW-4) were surveyed by West Company, a State of New Mexico Licensed Professional Land Surveyor (LPS Number 23263) for geodetic position and elevation, including surface elevation and top of casing (TOC) elevation. Figure 2 presents the monitoring well locations. Appendix C presents the boring logs and monitoring well completion records.

3.0 GROUNDWATER MONITORING

3.1 Depth to Groundwater and Groundwater Potentiometric Elevation

On September 23, 2019, depth to groundwater was gauged in wells TMW-1 and TMW-2 at 42.82 and 52.94 feet bgs, respectively. On December 26, 2019, depth to groundwater was gauged in wells TMW-1 and TMW-2 at 45.54 and 54.64 feet bgs, respectively.

On September 30, 2020, depth to groundwater was measured in wells TMW-1 through TMW-4 between about 45.95 feet bgs (TMW-1) and 55.15 feet bgs (TMW-2). The groundwater potentiometric surface elevation ranged from 3,366.15 feet above MSL in well TMW-2 to 3,365.26 feet above MSL in well TMW-1. The groundwater flow direction was from north to south at a gradient of 0.0016 feet per foot.

On December 7, 2020, depth to groundwater was measured in wells TMW-1 through TMW-4 between about 46.06 feet bgs (TMW-1) and 55.22 feet bgs (TMW-2). The groundwater potentiometric surface elevation ranged from 3,366.08 feet above MSL in well TMW-2 to 3,365.15 feet above MSL in well TMW-1. The groundwater flow direction was from north to south at a gradient of 0.0017 feet per foot.

No significant changes were observed in potentiometric surface elevation, flow direction, or gradient during the 2019 and 2020 sampling events. Figure 3a and Figure 3b present groundwater potentiometric surface maps from September 30, 2020 and December 7, 2020, respectfully. Table 1 presents monitoring well construction and gauging summary.

3.2 Groundwater Sampling and Laboratory Analysis

LAI personnel collected groundwater samples from wells TMW-1 and TMW-2 during the quarterly sampling events on September 23, 2019 and December 26, 2019. On December 26, 2019, groundwater samples were collected from a windmill located approximately 250 feet south of the spill area. Groundwater samples were collected from TMW-1, TMW-2, TMW-3, TMW-4, and the windmill during quarterly sampling events on September 30, 2020 and December 7, 2020.

On September 23, 2019, groundwater samples were collected from TMW-1 and TMW-2 using dedicated disposal PVC bailers. Groundwater samples were collected on December 26, 2019, September 30, 2020 and December 7, 2020, using the low stress, or low flow, method according to EPA protocol (EQASOP-GW4, Revision 4, September 29, 2017) where an environmental pump was submersed to the middle of the water column and pumped at a low flow rate, until environmental parameters were stabilized. Tygon tubing connected the submersible pump, was used to transport groundwater from the pump to the surface, where it was collected in laboratory grade containers. After samples were collected from each monitor well, the tygon tubing was discarded and the pump was thoroughly cleaned with a solution of potable water and laboratory grade detergent (Alconox®) and rinsed with distilled water. Samples from the windmill were collected at the end of a discharge pipe that that delivers water to a stock tank while the well was pumping.

Groundwater samples collected on September 23, 2019 and December 26, 2019 were delivered under chain of custody and preservation to DHL Analytical (DHL) a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory, located in Round Rock, Texas. DHL analyzed the samples for benzene, toluene, ethylbenzene and xylenes (BTEX), total dissolved solids (TDS), and chloride by EPA SW-846 Method 8260D, Method M2540C, and Method 300, respectfully. Groundwater collected on September 30, 2020 and December 7, 2020 were delivered under chain of custody and preservation to Xenco-Eurofins Laboratories (Xenco), a NELAP accredited laboratory located in Midland, Texas. Xenco analyzed the samples for BTEX, TDS, and chloride by EPA SW-846 Method 8021B, Method SM2540C, and Method 300, respectfully. Table 2 presents the laboratory analytical summary. Appendix D presents the laboratory reports.

3.2.1 Organic Analysis

DHL and Xenco did not report BTEX above the analytical reporting limit (RL) or New Mexico Water Quality Control Commission (WQCC) human health standards in samples collected during the quarterly groundwater sampling events.

3.2.2 Inorganic Analysis

On September 23, 2019, DHL reported chloride above the WQCC domestic water quality standard of 250 milligrams per liter (mg/L) in the groundwater sample from TMW-2 (338 mg/L). DHL reported TDS above the WQCC domestic water quality standard of 1,000 mg/L in the sample from well TMW-2 (1,220 mg/L).

On December 26, 2019, DHL reported chloride above the WQCC domestic water quality standard (250 mg/L) in the samples from well TWM-2 (307 mg/L) and windmill (259 mg/L). TDS was reported above the WQCC domestic water quality standard (1,000 mg/L) in the sample from TWM-2 (1,170 mg/L).
On September 30, 2020, Xenco reported chloride above the WQCC domestic water quality standard (250 mg/L) in samples collected from TWM-2 (314 mg/L), TMW-4 (1,020 mg/L) and the windmill (274 mg/L). TDS was reported above the WQCC domestic water quality standard (1,000 mg/L) in samples collected from TMW-2 (1,040 mg/L) and TMW-4 (2,040 mg/L).

On December 7, 2020, Xenco reported chloride above WQCC domestic water quality standard of (250 mg/L) in samples collected from TMW-2 (298 mg/l), TMW-4 (987 mg/L), and the windmill (287 mg/L). TDS was reported above the WQCC domestic water quality standard (1,000 mg/L) in samples collected from TMW-2 (1,050 mg/L) and TWM-4 (2,300 mg/L).

Figure 4a through Figure 4d present chloride concentration maps for groundwater samples collected on September 23, 2019, December 26, 2019, September 30, 2020, and December 7, 2020, respectfully. Figure 5a through 5d present TDS concentration maps for groundwater samples collected on September 23, 2019, December 26, 2019, September 30, 2020, and December 7, 2020, respectfully.

4.0 CONCLUSIONS

The following observations are made in this report:

- The groundwater flow direction was from north to south at gradients between approximately 0.0016 and 0.0017 feet per foot.
- No significant changes were observed in potentiometric surface elevation, flow direction, or gradient during the monitoring period.
- BTEX was not reported above the RL or WQCC human health standards in groundwater samples collected on September 23, 2019, December 26, 2019, September 30, 2020, and December 7, 2020.
- Chloride was reported above the WQCC domestic water quality standard (250 mg/L) in groundwater samples collected from TMW-2, TMW-4, and the windmill.
- TDS was above the WQCC domestic water quality standard (1,000 mg/L) in samples collected from TMW-2 and TMW-4.
- Apache will continue quarterly monitoring of groundwater in wells TMW-1 through TWM-4 and the windmill during 2021 with laboratory analysis of groundwater samples for BTEX, chloride and TDS.

Notice will be provided to OCD in Hobbs and Santa Fe, New Mexico at least 7 working days prior to each groundwater monitoring event. The OCD will be notified immediately upon receipt of laboratory analysis with significant increase of analyte concentrations.

Tables

Table 1
1RP-5636
Monitoring Well Completion and Gauging Summary
Apache Corportaion, EBDU 37, 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)
TMW-1	09/19/2019	74.36	71.00	2	3411.21	42.32 - 61.97	3.36	3,414.57	09/23/2019	46.18	42.82	28.18	3,368.39
									12/26/2019	48.90	45.54	26.27	3,365.67
									09/30/2020	49.31	45.95	25.05	3,365.26
									12/07/2020	49.42	46.06	24.94	3,365.15
TMW-2	09/19/2019	82.86	80.00	2	3421.30	47.50 - 67.50	2.86	3,424.16	09/23/2019	55.80	52.94	27.06	3,368.36
									12/26/2019	57.50	54.64	25.36	3,366.66
									09/30/2020	58.01	55.15	24.85	3,366.15
									12/07/2020	58.08	55.22	24.78	3,366.08
TWM-3	09/29/2020	71.29	68.41	2	3420.33		2.88	3,423.21	09/23/2019	--	--	--	--
									12/26/2020	--	--	--	--
									09/30/2020	57.62	54.74	13.67	3,365.59
									12/07/2020	57.68	54.80	13.61	3,365.53
TMW-4	09/29/2020	73.25	70.09	2	3420.03		3.16	3,423.19	09/23/2019	--	--	--	--
									12/26/2019	--	--	--	--
									09/30/2020	57.39	54.23	15.86	3,365.80
									12/07/2020	57.45	54.29	15.80	3,365.74

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
1RP-5636
Groundwater Sample Analytical Data Summary
Apache Corporation, EBDU 37, 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)	Depth To Water (Feet TOC)
NMWQCC Standard:		*0.01	*0.75	*0.75	*0.62	**250	**1,000	
Windmill	(') 08/01/2019	<0.001	<0.001	<0.001	<0.003	232	732	--
	(²) 09/23/2019	--	--	--	--	--	--	--
	(²) 12/26/2019	<0.000800	<0.00200	<0.00200	<0.00200	**259**	688	--
	(³) 09/30/2020	<0.00200	<0.00200	<0.00200	<0.00200	**274**	730	--
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**287**	930	--
TMW-1	(²) 09/23/2019	<0.00800	<0.00200	<0.00200	<0.00200	37.4	400	46.18
	(²) 12/26/2019	<0.000800	<0.00200	<0.00200	<0.00200	21.1	390	48.9
	(³) 09/30/2020	<0.00200	<0.00200	<0.00200	<0.00200	22.6	390	49.31
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	13.1	383	49.42
TMW-2	(²) 09/23/2019	<0.00800	<0.00200	<0.00200	<0.00200	**338**	**1,220**	55.8
	(²) 12/26/2019	<0.000800	<0.00200	<0.00200	<0.00200	**307**	**1,170**	57.5
	(³) 09/30/2020	<0.00200	0.00227	<0.00200	<0.00200	**314**	**1,040**	58.01
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**298**	**1,050**	58.06
TMW-3	09/23/2019	--	--	--	--	--	--	--
	12/26/2019	--	--	--	--	--	--	--
	(³) 09/30/2020	<0.00200	0.00322	<0.00200	0.00448	212	891	57.62
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	214	948	57.68
TMW-4	09/23/2019	--	--	--	--	--	--	--
	12/26/2019	--	--	--	--	--	--	--
	(³) 09/30/2020	<0.00200	0.00314	<0.00200	<0.00200	**1,020**	**2,040**	57.39
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**987**	**2,300**	57.45
DUP-1 (Windmill)	(³) 09/30/2020	<0.00200	<0.00200	<0.00200	<0.00200	**276**	794	--
DUP-1 (Windmill)	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**278**	908	--

Notes:
(') analysis performed by Cardinal Laboratories, Hobbs, New Mexico, by EPA SW-846 Method 8021B (BTEX) and titration methods (chloride and TDS)
(²) analysis performed by DHL Analytical, Round Rock, Texas, by EPA SW-846 Method 8021B (BTEX) and Method 300 (chloride)
(³) 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
- no data available
TOC - top of casing
Bold and highlighted denotes analyte concentration exceeds NMWQCC domestic water quality standard

Figures

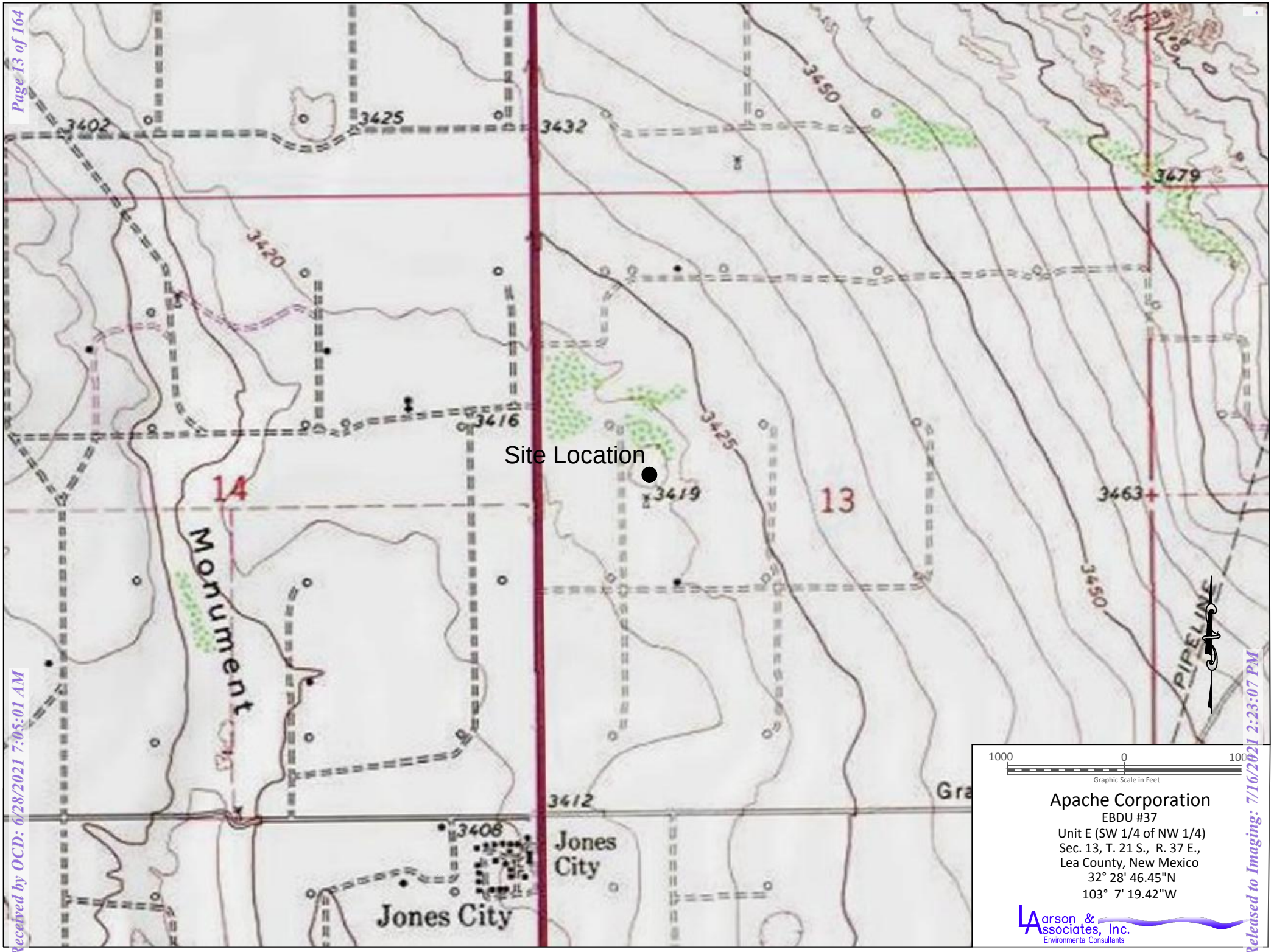


Figure 1 - Topographic Map

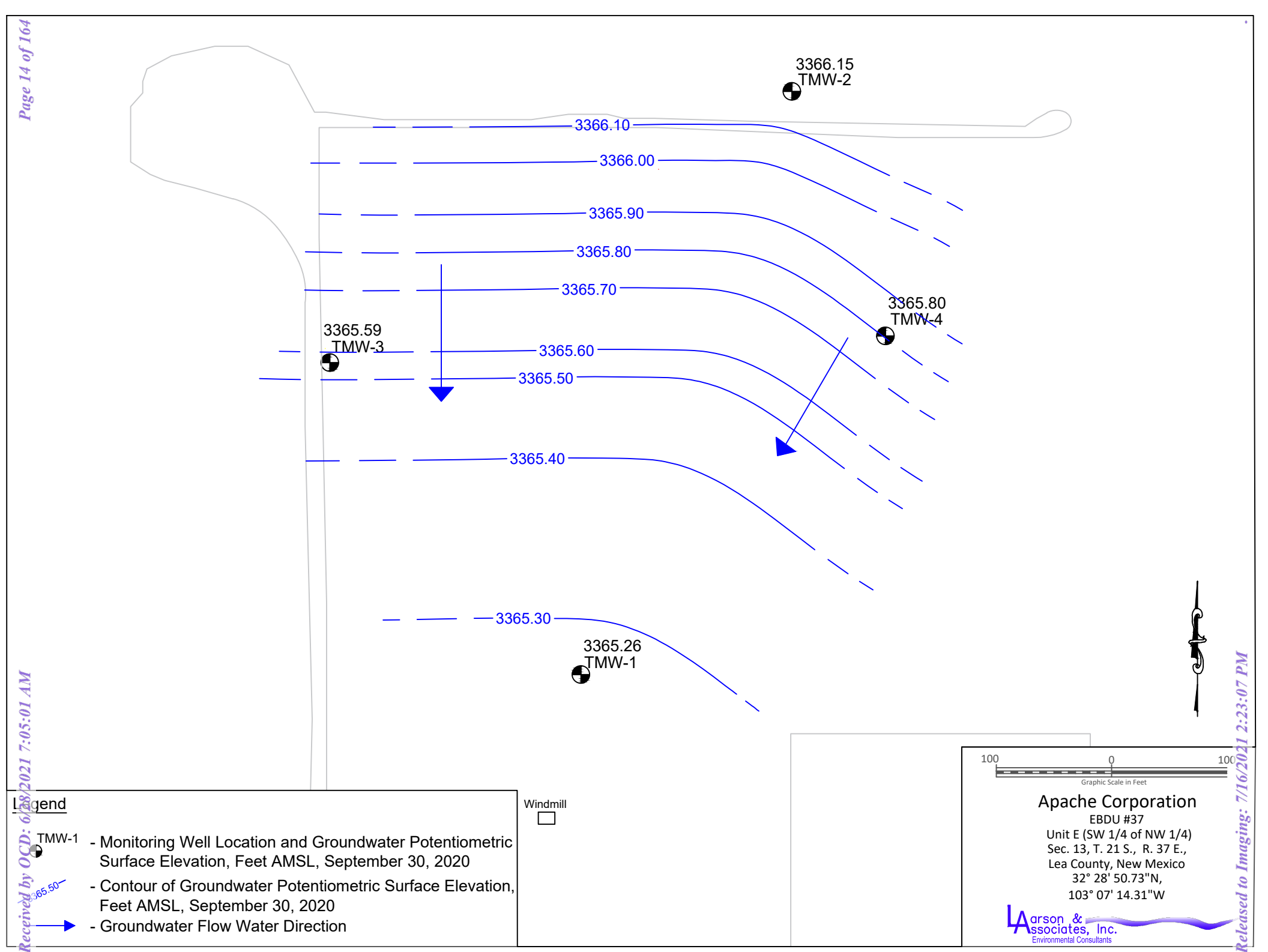


Figure 3a - Groundwater Potentiometric Map, September 30, 2020

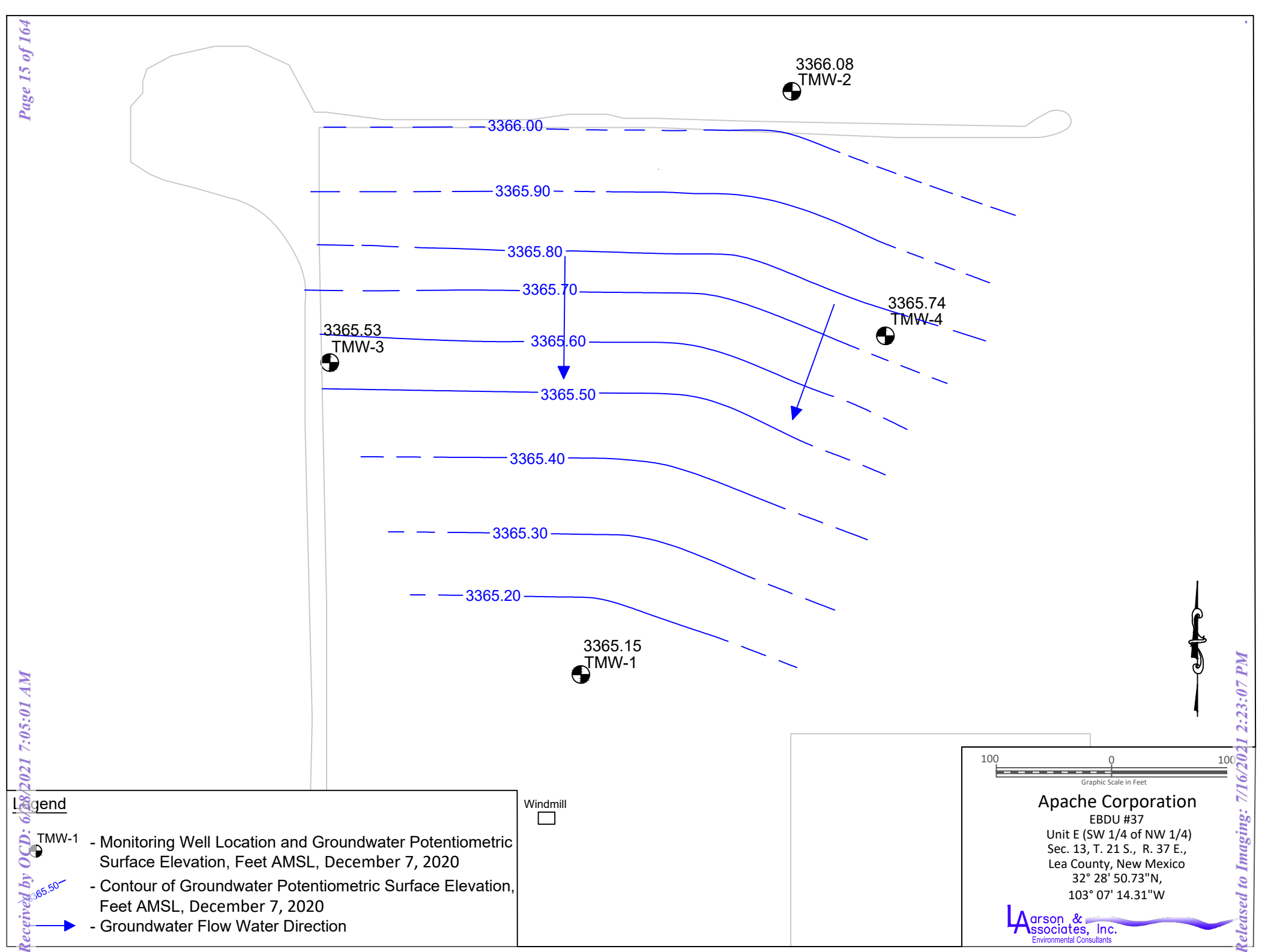


Figure 3b - Groundwater Potentiometric Map, December 7, 2020

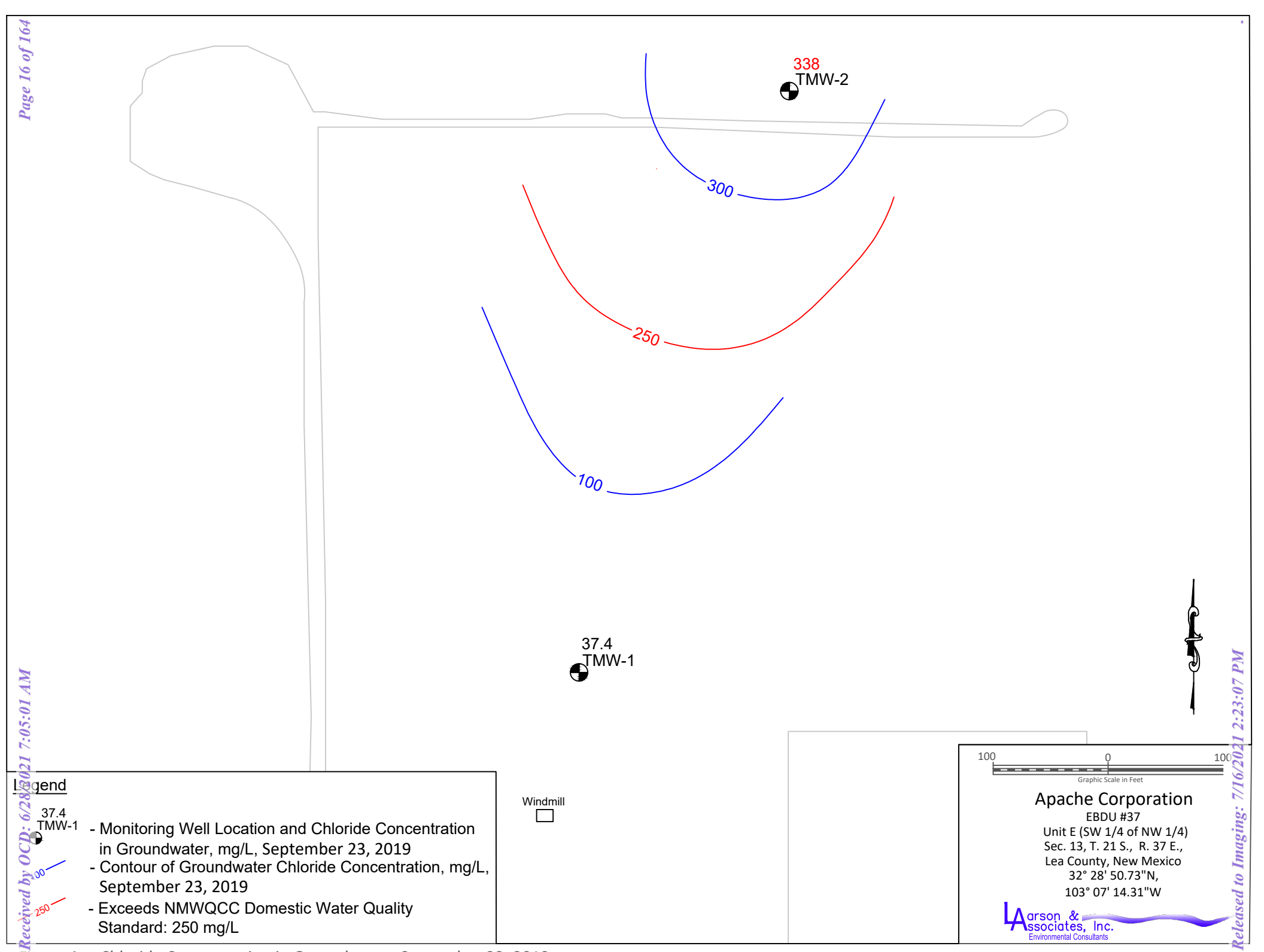


Figure 4a - Chloride Concentration in Groundwater, September 23, 2019

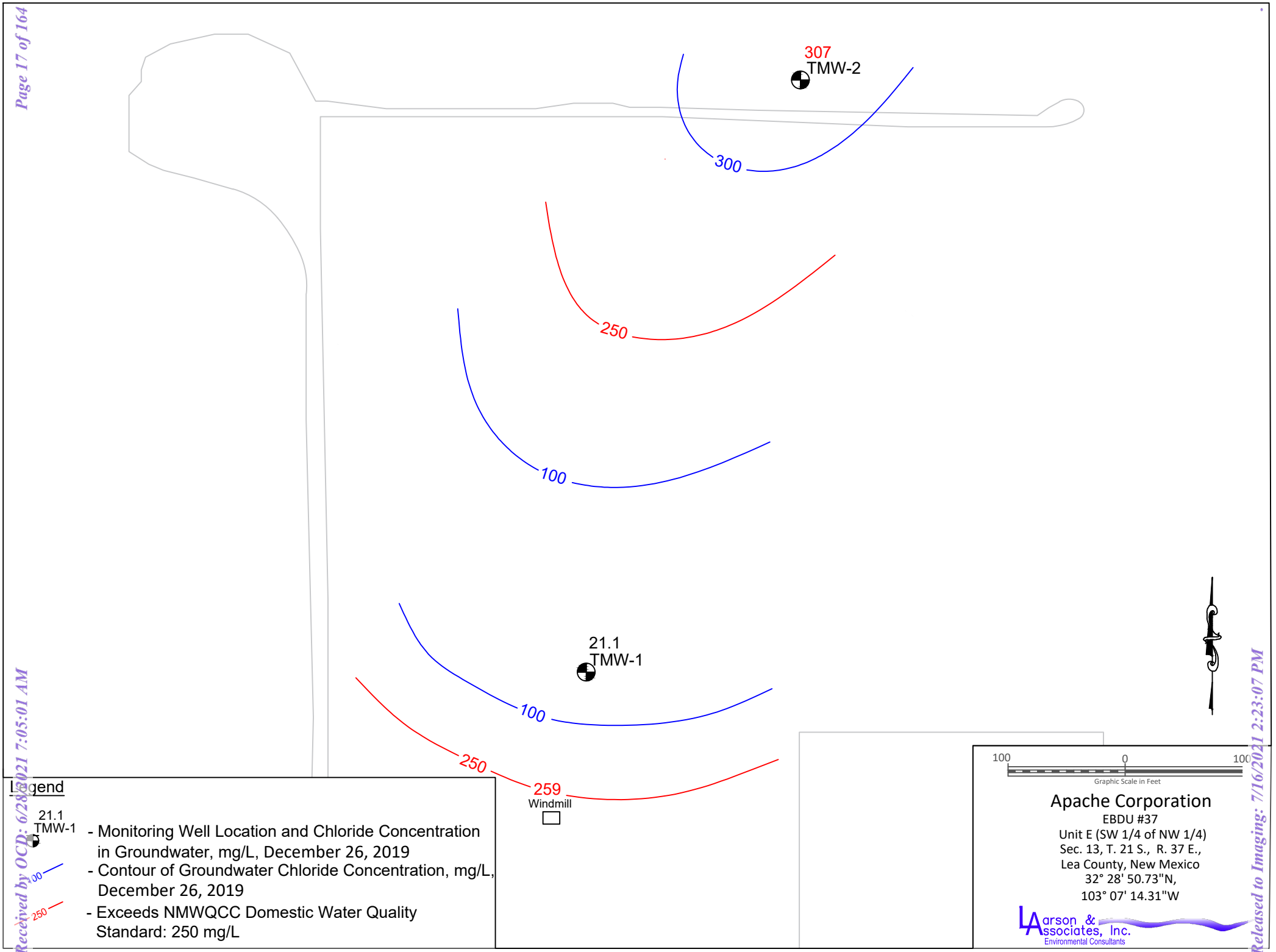


Figure 4b - Chloride Concentration in Groundwater, December 26, 2019

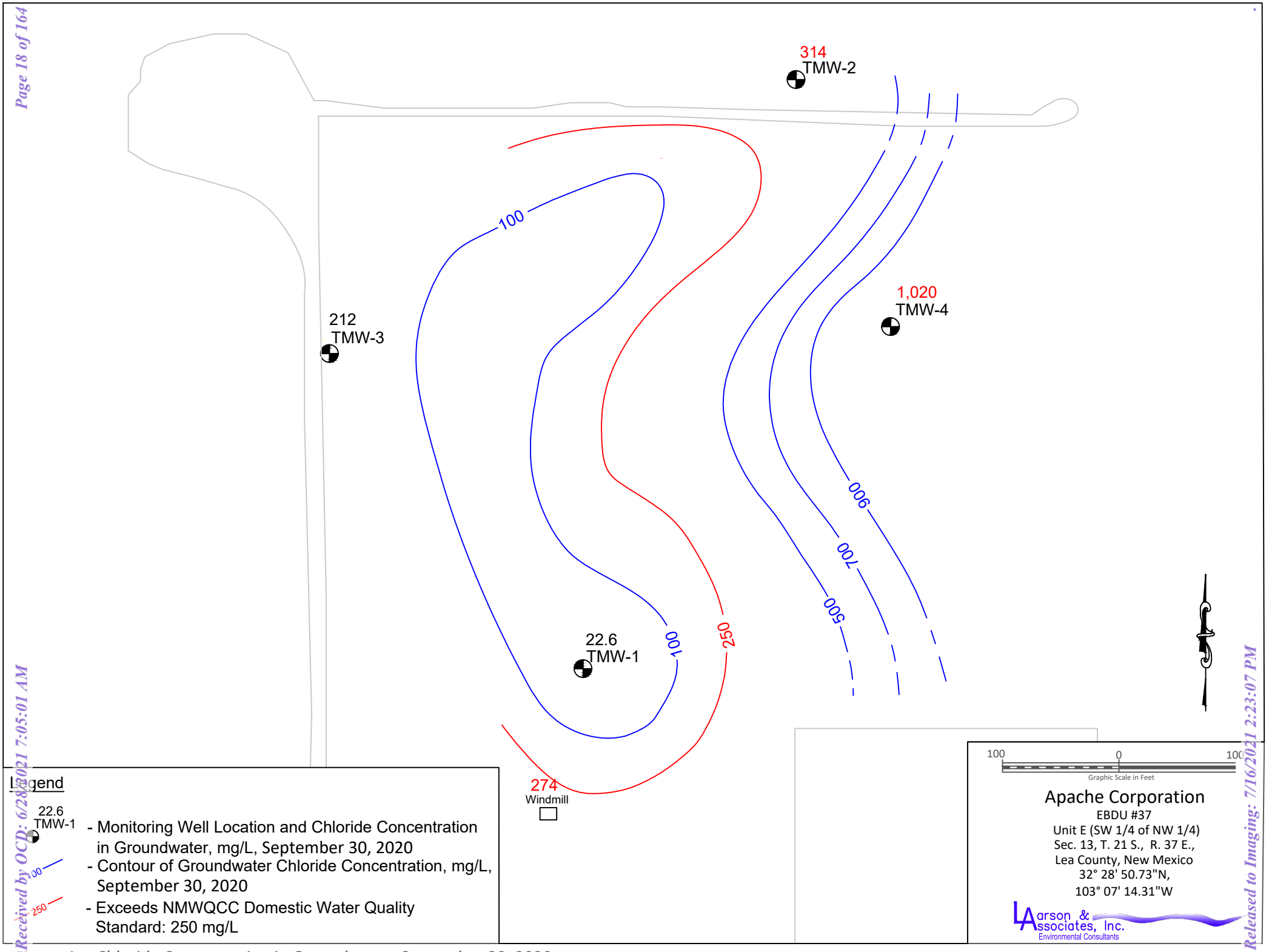


Figure 4c - Chloride Concentration in Groundwater, September 30, 2020

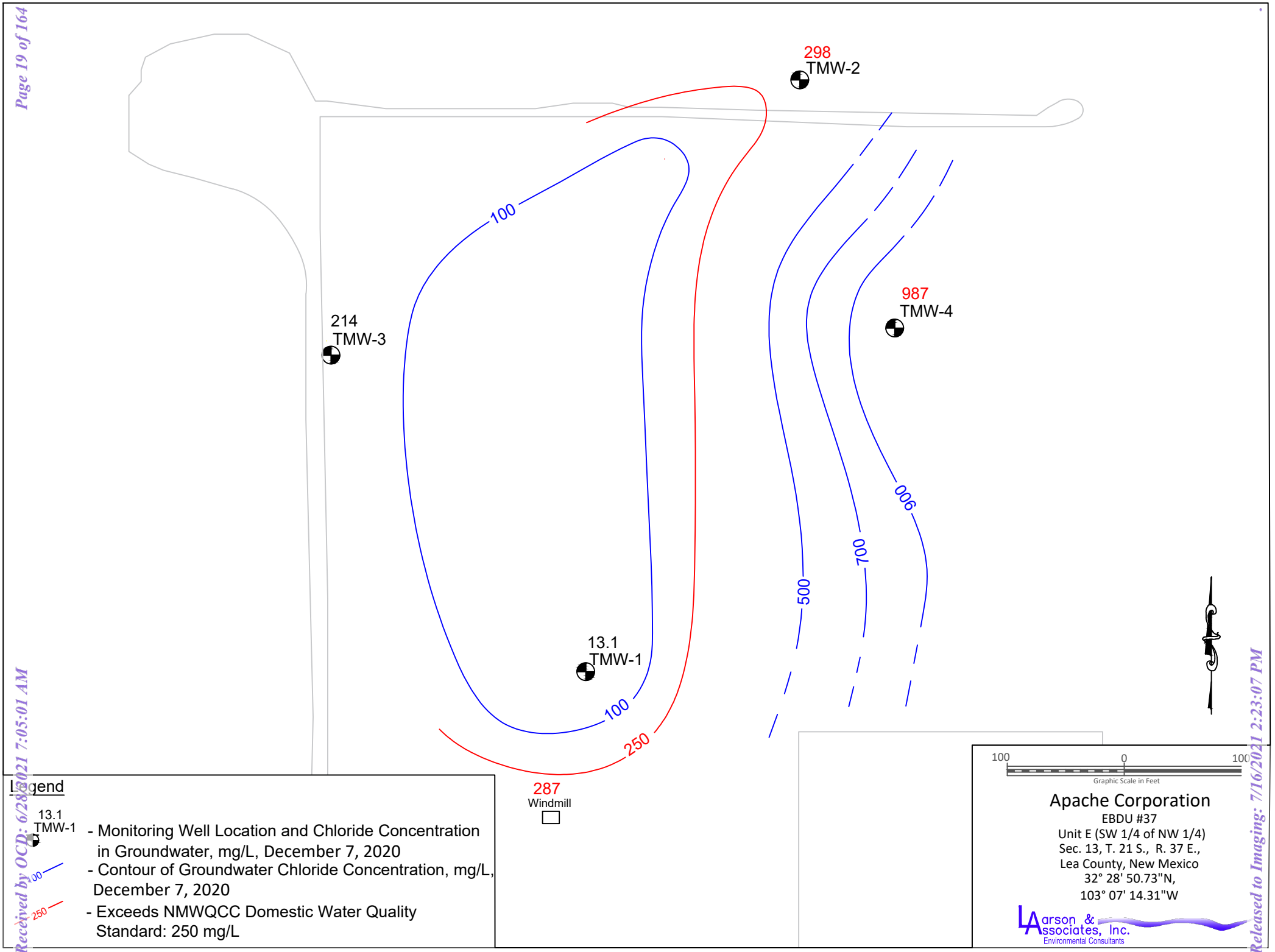
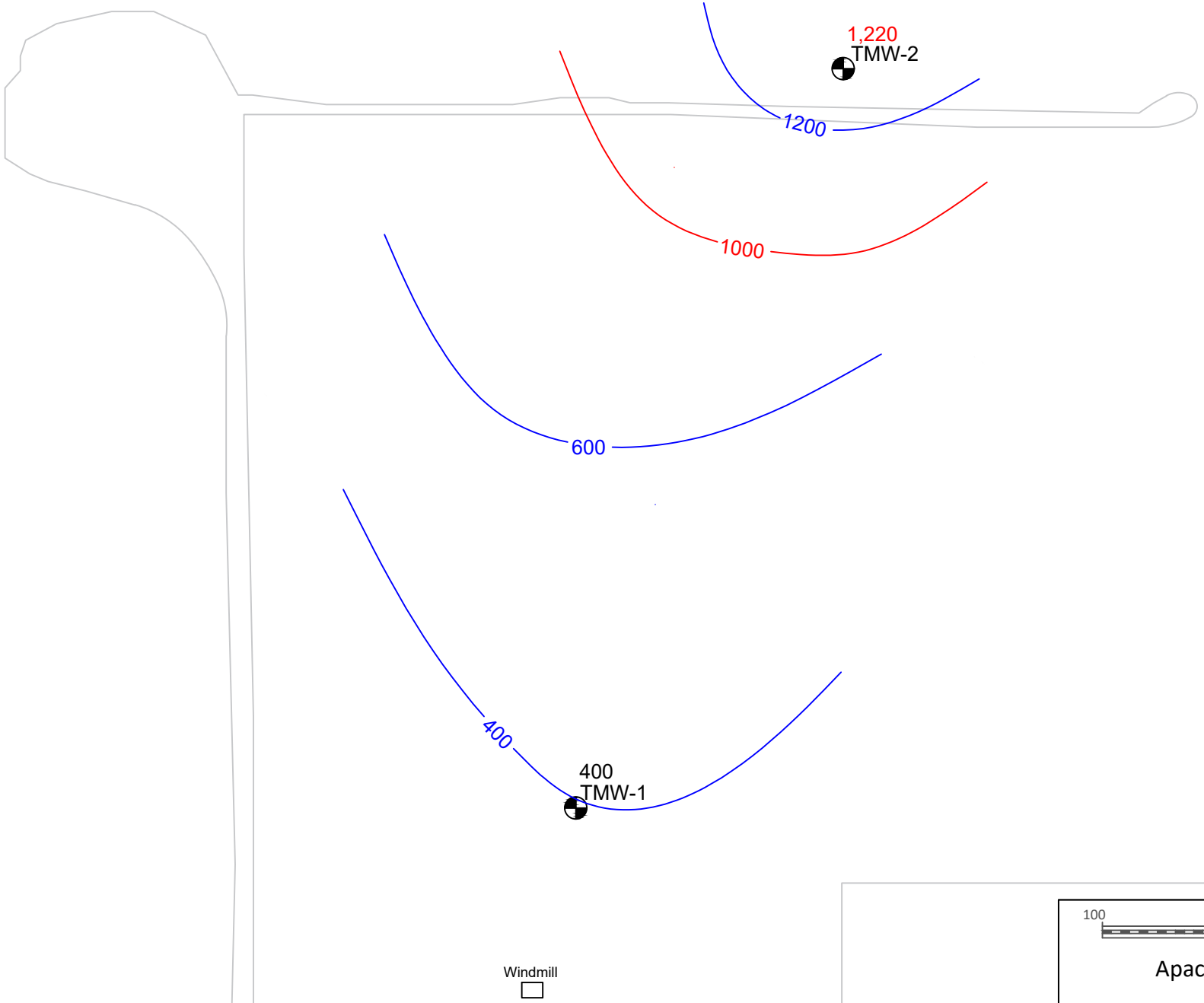


Figure 4d - Chloride Concentration in Groundwater, December 7, 2020



Legend

TMW-1 - Monitoring Well Location and TDS Concentration in Groundwater, mg/L, September 23, 2019

400 - Contour of TDS Concentration in Groundwater, mg/L

1000 - NMWQCC Domestic Water Quality Standard: 1,000 mg/L

100 0 100

Graphic Scale in Feet

Apache Corporation
EBDU #37
Unit E (SW 1/4 of NW 1/4)
Sec. 13, T. 21 S., R. 37 E.,
Lea County, New Mexico
32° 28' 50.73"N,
103° 07' 14.31"W

Larson & Associates, Inc.
Environmental Consultants

Figure 5a - TDS Concentration in Groundwater, September 23, 2019

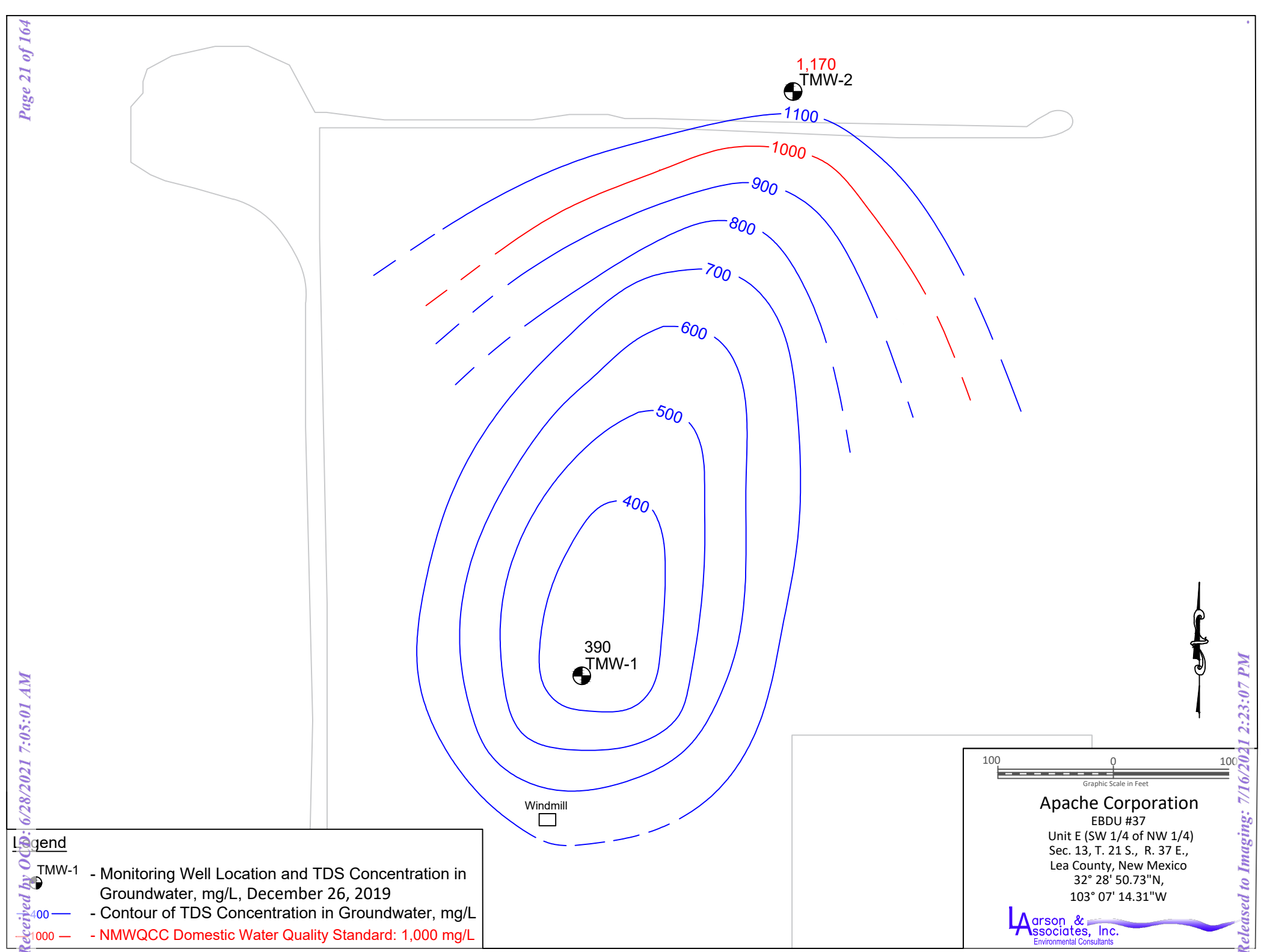


Figure 5b - TDS Concentration in Groundwater, December 26, 2019

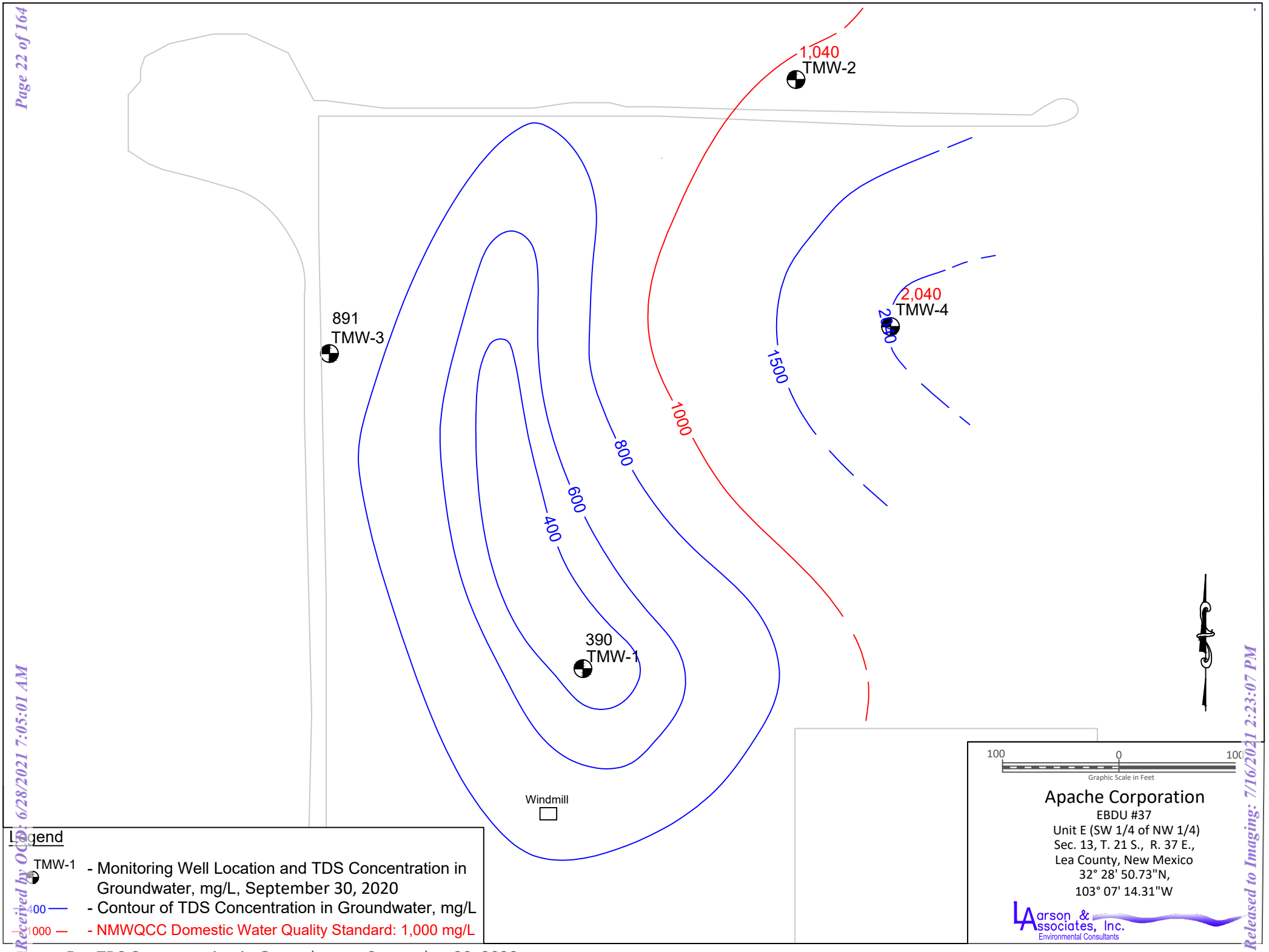
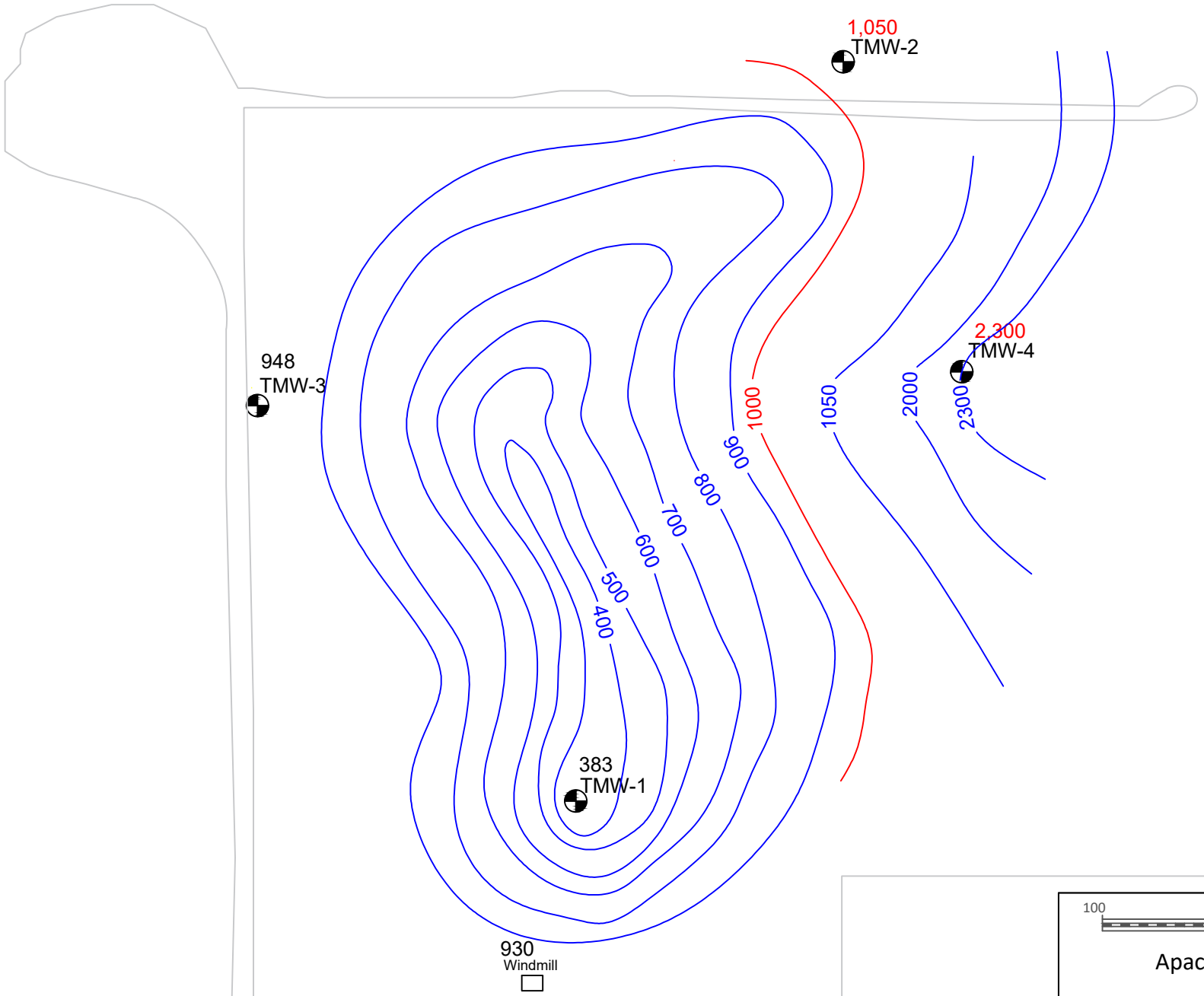


Figure 5c - TDS Concentration in Groundwater, September 30, 2020



Legend

TMW-1 - Monitoring Well Location and TDS Concentration in Groundwater, mg/L, December 7, 2020

400 — - Contour of TDS Concentration in Groundwater, mg/L

1000 — - NMWQCC Domestic Water Quality Standard: 1,000 mg/L

100 0 100

Graphic Scale in Feet

Apache Corporation
EBDU #37
Unit E (SW 1/4 of NW 1/4)
Sec. 13, T. 21 S., R. 37 E.,
Lea County, New Mexico
32° 28' 50.73"N,
103° 07' 14.31"W

LArson & Associates, Inc.
Environmental Consultants

Figure 5d - TDS Concentration in Groundwater, December 7, 2020

Appendix A

Initial C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NDHR1922141227
District RP	1RP-5636
Facility ID	
Application ID	pDHR1922140928

Release Notification

Responsible Party

Responsible Party: Apache Corporation	OGRID 873
Contact Name: Bruce Baker	Contact Telephone: (432) 631-6982
Contact email: Larry.Baker@apachecorp.com	Incident # *(assigned by OCD)*
Contact Mailing Address: 2350 W. Marland Blvd, Hobbs, NM 88240	

Location of Release Source

Latitude: W 32.4807053 Longitude: N -103.123085

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: EBDU #37 WIW	Site Type: Water Injection Well
Date Release Discovered: July 14, 2019	API # *3002506556*

Unit Letter	Section	Township	Range	County
E	12	21S	37E	LEA

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (*Name: William Stephens*)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☒ Crude Oil	Volume Released (Unknown bbls)	Volume Recovered (Unknown bbls)
☒ Produced Water	Volume Released (Unknown bbls)	Volume Recovered (Unknown bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☒ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

Isolation valve failure due to internal corrosion.

State of New Mexico
Oil Conservation Division

Incident ID	NDHR1922141227
District RP	1RP-5636
Facility ID	
Application ID	pDHR1922140928

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release?

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
Via email given to NM OCD by Bruce Baker, Senior Environmental Technician, Apache Corporation

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Jeff Broom Title: Environmental Technician

Signature: _____ Date: 07/24/2019

Email: Jeffrey.Broom@apachecorp.com Telephone: (432) 664-4677

OCD Only

Received by: Dylan Rose-Coss Date: 08/09/2019

Appendix B

OCD Communications

From: Billings, Bradford, EMNRD
To: Mark Larson
Cc: Baker, Larry; Rachel Owen
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan
Date: Monday, December 23, 2019 3:21:06 PM

12/23/2019

Apache Corp. – Larry Baker
Larson Environmental

RE: 1RP-5636/EBDU #37, the following:

The attached/stringed email as an addendum to offered Work Plan is approved, including the location of proposed monitor wells, as was discussed recently on the telephone.

Please keep a copy of this communication for your records, as NO paper copy will follow. It may take some days for this to be uploaded to The Oil Conservation Division (OCD) data base,

ODE appreciates your efforts.

Sincerely,

Bradford Billings
EMNRD/OCD
Santa Fe, NM

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations

---

From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, December 23, 2019 12:58 PM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Rachel Owen <rowen@laenvironmental.com>; Mark Larson <Mark@laenvironmental.com>
Subject: [EXT] Re: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Dear Bradford,
This email will confirm our phone conversation on December 20, 2019 for the EBDU #37 produced water release:

- Apache will install a boring in the bottom of the excavation to delineate the vertical extent of chloride in soil. Soil samples will be collected beginning at the bottom of the excavation and every five (5) feet thereafter until chloride decreases below 600 mg/Kg or groundwater is encountered;
- Apache will install two (2) additional monitoring wells at locations shown on the attached drawing. The monitoring wells will be constructed similar to monitoring well TMW-1 and TMW-2 with about 20 feet of screen placed above and below the groundwater level observed during drilling. Groundwater is expected to occur around 50 feet bgs therefore the borings will be advanced to around 70 feet bgs;
- Survey wells for top of elevation (top of casing and ground) for groundwater potentiometric surface elevation, flow direction and gradient;
- Apache will close the excavation at Area 1 according to the remediation plan dated October 29, 2019;
- Apache will close the excavation at Area 2, based on the laboratory results of samples from the boring to be placed in the bottom of the excavation, by filling the excavation to approximately 5 feet bgs with clean caliche, installing a 20 mill thickness polyethylene liner at approximately 5 feet bgs and backfilling to surface with clean topsoil;
- Seed Area 1 and Area 2 following remediation according to landowner requirements;
- Perform quarterly groundwater monitoring (5 wells) and reporting.

Your approval is this addendum remediation plan is requested. Please contact Bruce Baker with Apache or me if you have questions.

Mark J. Larson, P.G.
President/Sr. Hydrogeologist
507 N. Marienfeld St., Suite 202
Midland, Texas 79701
Office – 432-687-0901
Cell – 432- 556-8656
Fax – 432-687-0456
mark@laenvironmental.com

Larson & Associates, Inc.
Environmental Consultants

"Serving the Permian Basin Since 2000"

From: Billings, Bradford, EMNRD
To: Mark Larson
Cc: Baker, Larry; Robert Nelson
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan
Date: Tuesday, September 1, 2020 4:10:21 PM

09/01/2020

Mark,

As stated below was agreed in our phone conversation.

Bradford Billings

EMNRD/OCD

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations

From: Mark Larson <Mark@laenvironmental.com>
Sent: Tuesday, September 1, 2020 10:48 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: [EXT] FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
This email confirms our call today, September 1, 2020, for approval to complete backfilling the excavation in the swale at EBDU #37. As discussed the excavation is currently backfilled with caliche to approximately 5 feet below ground surface (bgs). NMOCD approved filling the remainder of the excavation to three (3) feet with clean caliche and to ground surface with topsoil. Since Apache is finishing backfilling the north excavation with topsoil it will fill the excavation in the swale with topsoil from 5 feet to ground surface. Notification will be submitted o NMOCD at least 7 days excluding weekends prior to installing monitoring wells. Please let me know if this is not consistent with our discussion. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.Baker@apachecorp.com or me if you have questions.
Thank you,
Mark J. Larson, P.G.
President/Sr. Hydrogeologist
507 N. Marienfeld St., Suite 202
Midland, Texas 79701
Office – 432-687-0901
Cell – 432- 556-8656

Fax – 432-687-0456
mark@laenvironmental.com

From: Mark Larson
Sent: Thursday, August 13, 2020 8:26 AM
To: 'Bradford.Billings@state.nm.us' <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
Soil sampling at EBDU #37 was completed on August 11, 202. The laboratory reported chloride above the OCD closure criteria of 600 milligrams per kilogram (mg/Kg) in two (2) samples: BH-3, 10 feet (774 mg/Kg) and 12 feet (666 mg/Kg). Chloride was 419 mg/Kg in the sample from 14 feet. Apache would like to forgo installing the 20 mil thickness polyethylene liner in the bottom of the large excavation and fill the remainder of the Area 2 excavation with caliche to approximately 3 feet bgs and with top soil from 3 feet to ground surface. The excavation north of the large excavation will be completed per the approved remediation plan. Please see the attached drawing (Figure 2) for the boring locations. Table 4 presents the confirmation composite sample locations. Drilling and installation for two (2) monitoring wells is scheduled for Monday, August 18th.

Your approval is this remediation plan modification is requested. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.Baker@apachecorp.com or me if you have questions.

Mark J. Larson, P.G.
President/Sr. Hydrogeologist
507 N. Marienfeld St., Suite 202
Midland, Texas 79701
Office – 432-687-0901
Cell – 432- 556-8656
Fax – 432-687-0456
mark@laenvironmental.com

"Serving the Permian Basin Since 2000"

From: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Sent: Monday, August 10, 2020 10:51 AM
To: Mark Larson <Mark@laenvironmental.com>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

08/10/2020

Hello M. Baker (Apache) and Mr. Larson (LAI),

As OCD has been informed you are looking to proceed on the site tomorrow, the following:

OCD approves the modifications as indicated in attached email form LAI. If the circumstances occur as is possible, there would be no need for the liner, and OCD agrees. OCD appreciates the desire to generate accurate data and is please for your efforts along those lines. If field data indicates a modification please attempt to contact me on phone or email.

Thank you and please be safe and careful.

Sincerely,

Bradford Billings
EMNRD/OCD

From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, August 10, 2020 8:49 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: [EXT] FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
I am following up on the email below to see if you have had a moment to review.
Thank you,
Mark

From: Mark Larson
Sent: Friday, August 7, 2020 11:45 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
Apache Corporation has completed backfilling the deep excavation (Area 2) at EBUD #37 (1RP-5636) with clean caliche to approximately five (5) feet below ground surface (bgs) to allow access for a Geoprobe Model 7822DT to delineate the vertical extent of chloride in soil below the excavation at approximately 12 feet bgs. Personnel from Larson & Associates, Inc. (LAI) collected soil samples at the proposed boring location (BH-1) near the center of the excavation at 10, 12, 14, 16, 18 and 20 feet bgs, on August 3, 2020. The laboratory reported chloride at 11.6 mg/Kg (10 feet), 13.3 mg/Kg (12 feet), 13.4 mg/Kg (14 feet), 22.9 mg/Kg (16 feet), 34.4 mg/Kg (18 feet) and 24.7 mg/Kg at 20 feet bgs. Previous bottom samples from B15 collected on August 8, 2019, from 13, 15, 17, 19, 21 and 22 feet bgs, reported chloride at 720 mg/Kg, 1,840 mg/Kg, 1,950 mg/Kg, 3,800 mg/Kg, 544 mg/Kg, and 3,440 mg/Kg, respectively, and suggested possible sample cross contamination. Benzene, BTEX and TPH were the analytical method reporting limits. LAI personnel collected composite sidewall samples from the excavation to approximately 5 feet that were analyzed for benzene, BTEX and TPH. The final concentrations are below the OCD cleanup levels in Table 1 (19.15.29 NMAC).

Apache requests approval from OCD to collect additional delineation soil samples with the Geoprobe from four (4) locations (north, south, east and west) from location BH-1 at the same depths (10, 12,14,16,18 and 20 feet) and analyze the samples for chloride. Apache would like to forgo installing the 20 mil thickness polyethylene liner in the bottom of the large excavation If chloride concentrations are below the OCD remediation limit (600 mg/Kg). Apache will fill the remainder of the Area 2 excavation with caliche to approximately 3 feet bgs and with top soil from 3 feet to ground surface. The excavation north of the large excavation will be completed per the approved remediation plan. Please see the attached drawing (Figure 2) for the proposed borings BH-2 through BH-5. Figure 2a presents the composite soil sample locations. Table 4 presents the confirmation composite sample locations.

Your approval is this remediation plan modification is requested. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.Baker@apachecorp.com or me if you have questions.

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mark@laenvironmental.com

Larson & Associates, Inc.
Environmental Consultants

"Serving the Permian Basin Since 2000"

From: Mark Larson <Mark@laenvironmental.com>

Sent: Monday, December 23, 2019 1:58 PM
To: Bradford.Billings@state.nm.us
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Rachel Owen <rowen@laenvironmental.com>; Mark Larson <Mark@laenvironmental.com>
Subject: Re: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Dear Bradford,
This email will confirm our phone conversation on December 20, 2019 for the EBDU #37 produced water release:

- Apache will install a boring in the bottom of the excavation to delineate the vertical extent of chloride in soil. Soil samples will be collected beginning at the bottom of the excavation and every five (5) feet thereafter until chloride decreases below 600 mg/Kg or groundwater is encountered;
- Apache will install two (2) additional monitoring wells at locations shown on the attached drawing. The monitoring wells will be constructed similar to monitoring well TMW-1 and TMW-2 with about 20 feet of screen placed above and below the groundwater level observed during drilling. Groundwater is expected to occur around 50 feet bgs therefore the borings will be advanced to around 70 feet bgs;
- Survey wells for top of elevation (top of casing and ground) for groundwater potentiometric surface elevation, flow direction and gradient;
- Apache will close the excavation at Area 1 according to the remediation plan dated October 29, 2019;
- Apache will close the excavation at Area 2, based on the laboratory results of samples from the boring to be placed in the bottom of the excavation, by filling the excavation to approximately 5 feet bgs with clean caliche, installing a 20 mill thickness polyethylene liner at approximately 5 feet bgs and backfilling to surface with clean topsoil;
- Seed Area 1 and Area 2 following remediation according to landowner requirements;
- Perform quarterly groundwater monitoring (5 wells) and reporting.

Your approval is this addendum remediation plan is requested. Please contact Bruce Baker with Apache or me if you have questions.

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"Serving the Permian Basin Since 2000"

From: Billings, Bradford, EMNRD
To: Mark Larson
Cc: Baker, Larry; Robert Nelson
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan
Date: Monday, August 10, 2020 11:03:12 AM

08/10/2020

Hello M. Baker (Apache) and Mr. Larson (LAI),

As OCD has been informed you are looking to proceed on the site tomorrow, the following:

OCD approves the modifications as indicated in attached email form LAI. If the circumstances occur as is possible, there would be no need for the liner, and OCD agrees. OCD appreciates the desire to generate accurate data and is please for your efforts along those lines. If field data indicates a modification please attempt to contact me on phone or email.

Thank you and please be safe and careful.

Sincerely,

Bradford Billings
EMNRD/OCD

From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, August 10, 2020 8:49 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: [EXT] FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
I am following up on the email below to see if you have had a moment to review.
Thank you,
Mark

From: Mark Larson
Sent: Friday, August 7, 2020 11:45 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,

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From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, December 23, 2019 1:58 PM

To: Bradford.Billings@state.nm.us
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Rachel Owen <rowen@laenvironmental.com>; Mark Larson <Mark@laenvironmental.com>
Subject: Re: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

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Your approval is this addendum remediation plan is requested. Please contact Bruce Baker with Apache or me if you have questions.

Mark J. Larson, P.G.
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Environmental Consultants

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Appendix C

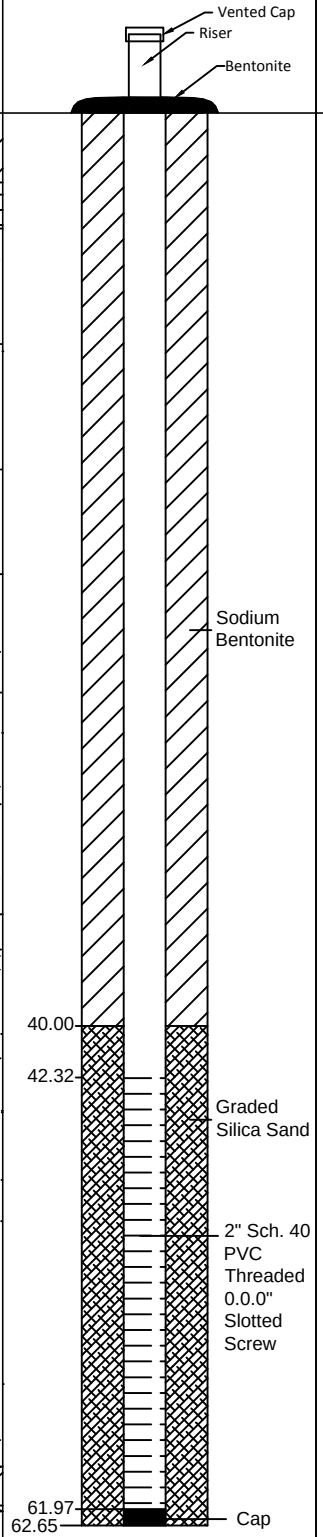
Boring Logs

BORING RECORD

Start: 11:40
Finish: 12:58

Surface Elevation:
TOC Elecation:

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG
	0	Silty Clay, 7.5YR, 5/1, Gray, Very Fine Grained Quartz Sand, Dry	CL	
	5	Caliche, 7.5YR, 7/1 to 7/2, Pinkish Gray, Sandy, Fine to Very Fine Grained Quartz Sand, Dry	Caliche	
	10	Silty Sand, 10YR, 6/4, Light Yellowish ..., Very Fine to Fine Grained Quartz Sand, Poorly Sorted, Subrounded, Loose	SM	
	15			
	20	7.5YR, 6/6, Reddish Yellow Below 10', Poorly Sorted, ... Round		
	25	10YR, 7/4, Very Pale Brown Below 15'		
	30	Sand, 5YR, 5/6 to 6/6, Yellowish Red to Reddish Yellow, Very Fine Grained Quartz Sand, Poorly Sorted, Round, Moist, Very Moist	SW	
	35	Below 35'		
	40	Sandstone, 5YR, 6/6, Reddish Yellow, Very Fine Grained Quartz Sand,Poorly Sorted, Moderately Well Cemented to Well Cemented	Sand Stone	
46.72	45			
	50			
	55			
	60	Gravelly Sand, 7.5YR, 6/6, Reddish Yellow, Fine to Medium Grained Quartz Sand, Round, Cobbles to 40mm	SP	
		TD: 62'		



REMARKS	NUMBER	RECOVERY	DEPTH
BACKGROUND PID READING SOIL : _____ PPM SOIL : _____ PPM			1, 5, 10, 15, 20, 25, 30, 35, 40, 45, 60

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 Corp./ 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : M. Larson
DRILLING CONTRACTOR :
DRILLING METHOD : SR/WR

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 9-19-2019

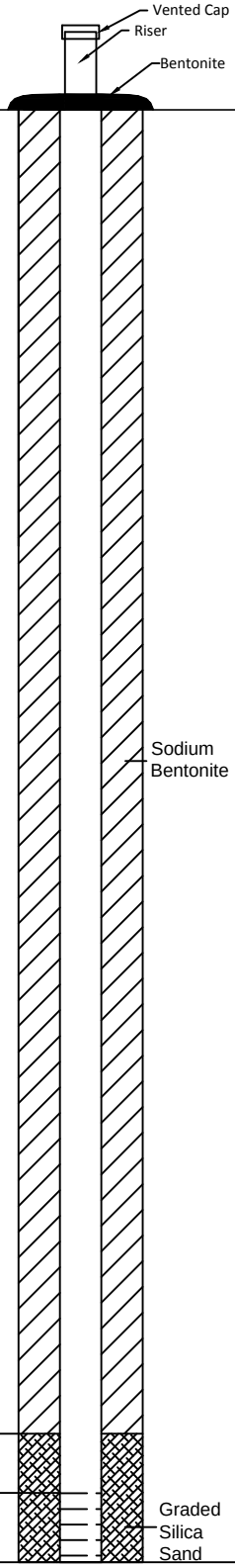
BORING NUMBER : TMW-1

BORING RECORD

Start: 15:02
Finish: 15:55

Surface Elevation: 3,563.50'
TOC Elecation: 3,566.23'

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	REMARKS BACKGROUND PID READING
	0	Silty Clay, 10YR, 5/6, Ash Brown, Dry	CL		15:02
	5	Caliche, 7.5YR, 8/2, Pinkish White, Sandy to Moderate Very Fine Grained Quartz Sand	Caliche		15:03
	10				15:05
	15	Silty Sand, 7.5YR, 7/2, Pinkish Gray, Very Fine Grained Quartz Sand, Poorly Sorted, Dry	SM		15:10
	20				15:15
	25	Sand, 5YR, 6/0, Reddish Yellow, Very Fine Grained Quartz Sand, Poorly Sorted, Dry	SW		15:17
	30				15:22
	35				15:23
	40				15:28
	45	Sand, 5YR, 6/6, Reddish Yellow, Moderate Well Cemented, Poorly Sorted, Dry	SW		15:30
		Continue			



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 : 9-20-2019
BORING NUMBER : TMW-2

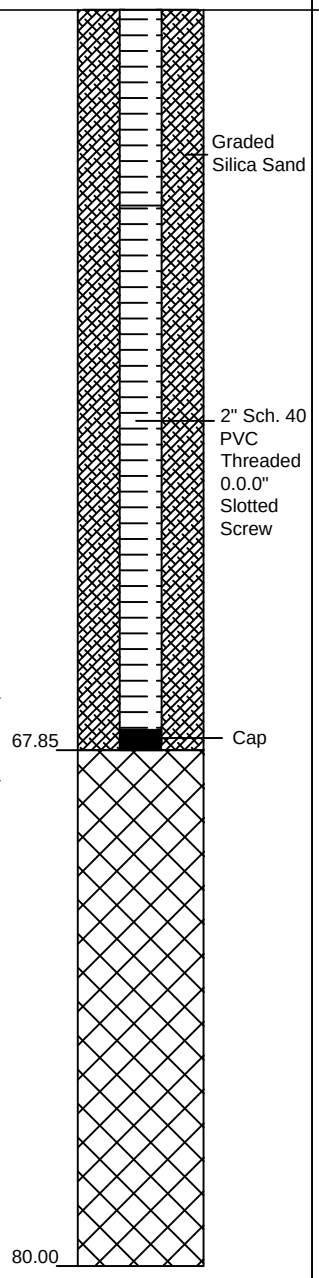
JOB NUMBER : Apache Corp. / 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : M. Larson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

BORING RECORD

Start: 15:02
Finish: 15:55

Surface Elevation: 3,563.50'
TOC Elecation: 3,566.23'

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	*Continue*	NUMBER	RECOVERY	DEPTH	REMARKS BACKGROUND PID READING SOIL : PPM SOIL : PPM
	50	*Continue*							
	55	Silty and Clayey Below 50', Moist at 55'	SM-SC						
	60								
	65								
	70								
	75	Gravel, 7.5YR, 4/3, Light Brown, Poorly Sorted, Round, Red Bed	GW						
	80	TD: 79'							



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 : 9-20-2019
BORING NUMBER : TMW-2

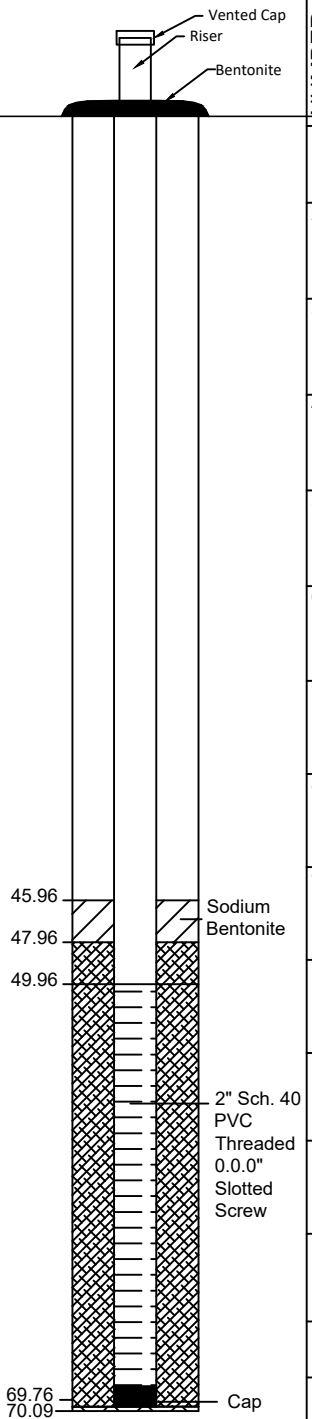
JOB NUMBER : Apache Corp. / 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : M. Larson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

BORING RECORD

Start: 09:35 MST
Finish: 10:30 MST

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG
	0	Sand, 7.5YR 4/4, Brown, Fine to Very Fine Quartz Sand,Quartz and Feldspar Moderate to Well Sorted, Sub Rounded to Well Rounded	SM	
	5			
	10	Caliche, 7.5YR 8/2, Pinkish White, Sandy, Fine to Very Fine Grains, Well Sorted, Well Rounded	Caliche	
	15			
	20	Sand, 10YR 8/2, Very Pale Brown, Quartz Rich Sand, Well Rounded to Very Well Rounded, Very Well Sorted, Fine to Very Fine Grained Quartz Sand	SM	
	25			
	30	7.5YR 5/6, Strong Brown, Oxidized, Quartz Rich, Well Rounded to Very Well Rounded, Very Well Sorted, Fine to Very Fine Grained Quartz Sand with Increase in Depth Lithology Remains the Same		
	35			
	40	@37' becomes Silty to Very Fine Grained Quartz Sand to 65'		
	45			
	50			
	55		SM	
	60			
	65			
	70	Gravelly Sand, 7.5YR, Strong Brown, Fine to Very Fine Coarse Sand, Quartz and Feldspar, Oxidized, Sub Angular to Sub Rounded, Gravel(5-15mm), Poorly Sorted	SP	
	75			
		TD: 68.41'		

PID READING / SAMPLE / REMARKS



NUMBER	RECOVERY	DEPTH	BACKGROUND PID READING
1		1	SOIL : PPM
2		5	SOIL : PPM
3		10	
4		15	
5		20	
6		25	
7		30	
8		35	
9		40	
10		45	
11		50	
12		55	
13		60	
14		65	
15		68	

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/ 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 09-29-2020

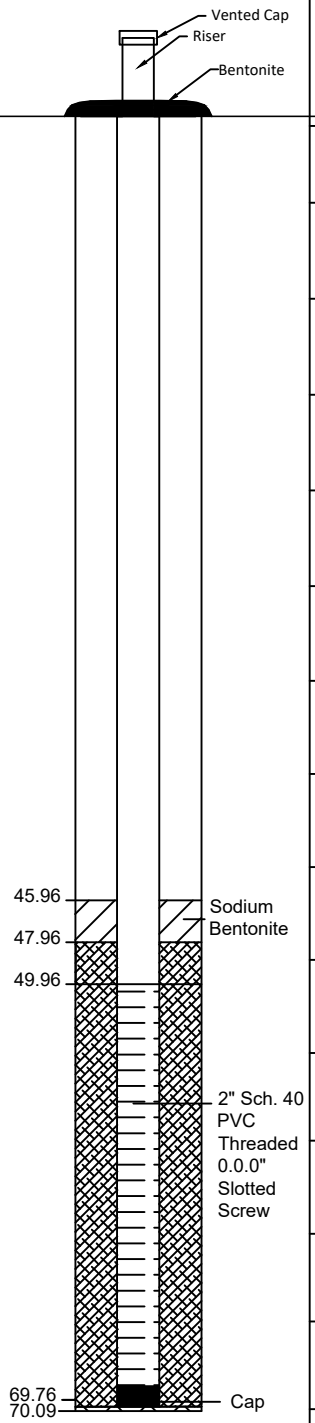
BORING NUMBER : TMW-3

BORING RECORD

Start: 12:45
Finish: 13:40

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG
	0	Caliche, 7.5YR 8/2, Pinkish White, Medium to Very Fine, Poorly Sorted, Sub Angular to Sub Rounded	Caliche	
	15	Sand, 10YR 8/2, Very Pale Brown, Quartz Rich Sand, Well Rounded to Very Well Rounded, Very Well Sorted, Fine to Very Fine Quartz Sand	SM	
	25	7.5YR 5/6, Strong Brown, Oxidized, Quartz Rich Sand, Sub Angular to Sub Rounded, Poorly Sorted, Coarse to Fine Grained Quartz Sand with Increase in Depth @34' Lithology Remained Constant and Grain Size Decreased to Fine to Very Fine Quartz Sand, Well Sorted, Rounded to Well Rounded		
	55	Sand, 7.5YR, Strong Brown, With Gravel, Fine to Very Coarse Quartz Sand, Quartz and Feldspar, Oxidized, Sub Angular to Sub Rounded, Gravel (5-15mm), Poorly Sorted	SM	
	70	TD: 70.09'		

PID READING / SAMPLE / REMARKS



NUMBER	RECOVERY	DEPTH
1		1
2		5
3		10
4		15
5		20
6		25
7		30
8		35
9		40
10		45
11		50
12		55
13		60
14		65
15		70

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/ 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 09-29-2020

BORING NUMBER : TMW-4

Appendix D

Laboratory Reports

October 04, 2019

Mark Larson
Larson & Associates
507 N. Marienfeld #205
Midland, TX 79701
TEL: (432) 687-0901
FAX (432) 687-0456

Order No.: 1909235

RE: EBDU #37

Dear Mark Larson:

DHL Analytical, Inc. received 2 sample(s) on 9/26/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative and all estimated uncertainties of results are within method specifications.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24

Table of Contents

Nº 0770

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

DATE: 9-25-2019 PAGE 1 OF 1
PO#: LAB WORK ORDER#: 1909235
PROJECT LOCATION OR NAME: EBDU #37
LAI PROJECT #: 19-0112-49 COLLECTOR: EC
Data Reported to:

TRRP report? ☐ Yes ☒ No
TIME ZONE: Time zone/State: MST
S=SOIL W=WATER A=AIR P=PAINT SL=SLUDGE OT=OTHER

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 ☐	TBLP - METALS (RCRA) ☐	TCLP - PEST ☐	TCLP VOC ☐	HERB ☐	TOTAL METALS (RCRA) ☐	Semi-VOC ☐	LEAD - TOTAL ☐	D.W. 200.8 ☐	OTHER LIST ☐	RCI ☐	TOX ☐	TCLP ☐	TDS ☒	FLASHPOINT ☐	TSS ☐	pH ☐	% MOISTURE ☐	HEXAVALENT CHROMIUM ☐	CYANIDE ☐	EXPLOSIVES ☐	PECHLORATE ☐	CHLORIDE ☒	ANIONS ☐	ALKALINITY ☐	m300	FIELD NOTES
TMW 1	01	9-23-19	15:00	W	4	3			4		X																							X					X								
TMW 2	02	9-23-19	17:10	W	4	3			4		X																							X					X								
TOTAL																																															

RELINQUISHED BY:(Signature) Rachel Owen DATE/TIME 9-25-19/9:00 RECEIVED BY: (Signature) LSO
RELINQUISHED BY:(Signature) LSO DATE/TIME 9/26/19 0800 RECEIVED BY: (Signature)
RELINQUISHED BY:(Signature) DATE/TIME RECEIVED BY: (Signature)
LABORATORY: DHL

3

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

LABORATORY USE ONLY:
RECEIVING TEMP: 3.7°C THERM#: 78
CUSTODY SEALS - ☐ BROKEN ☒ INTACT ☐ NOT USED
☒ CARRIER BILL # LSO
☐ HAND DELIVERED

LSO

WWW.LSO.COM
Questions? Call 800-800-8984

Airbill No. LSO0BYG9

LSO0BYG9

1. To: Print Name (Person) / Phone (Important)

Company Name

Street Address (No P.O. Box or P.O. Box Zip Code® Deliveries)

Suite / Floor

City / State / Zip

2. From: Print Name (Person) / Phone (Important)

Company Name

Street Address

Suite / Floor

205

City / State / Zip

3. Service: Visit www.lso.com for availability of services to your destination and enjoy added features by creating your shipping label online.

LSO Priority Overnight* 10:30 a.m. to most cities

O Early Overnight* :30 a.m. select cities

Economy Next Day* a.m. to most cities

d Day*

☐ LSO Ground

☐ LSO Saturday*

☐ Other

*Check commitment times and availability at www.lso.com

Assumed LSO Priority Overnight service unless otherwise noted.

Without Delivery Signature (See Limits of Liability below)

Release Signature

x W x H

4. Package: Weight:

Your Company's Billing Reference Information

Ship Date: (mm/dd/yy)

5. Payment:

FOR DRIVER USE ONLY

Driver Number

☐ Check here if LSO Supplies are used with LSO Ground Service.

Pick-up Location

Date:

Time:

City Code:

WRITING ON AIRBILL MAY DELAY TRANSIT TIMES OR RESULT IN NON-DELIVERY. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater ceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. If deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. "Signature Required" service is only available when printing a label online at LSO.com. ERY SIGNATURE WILL BE OBTAINED FOR LSO EARLY OVERNIGHT SERVICE. Packaging provided by LSO is for EXPRESS USE ONLY – NEVER TO BE USED FOR LSO GROUND Service. OVERSIZE RATES MAY Y. DELIVERY COMMITMENTS MAY VARY. ADDITIONAL FEES MAY APPLY. See LSO Service Guide for further details.

CUSTODY SEAL
DATE 9/25/19
SIGNATURE Rachel Owen

QEC
Quality Environmental Containers
800-255-3950 • www.qecusa.com

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name Larson & Associates Date Received: 9/26/2019

Work Order Number 1909235 Received by EL

Checklist completed by: _____ 9/26/2019 Reviewed by DL 9/26/2019
Signature Date Initials Date

Carrier name LoneStar

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	3.7 °C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH<2 acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____

Any No response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Page 1 of 1

DHL Analytical, Inc. **Date:** *04-Oct-19*

CLIENT: Larson & Associates
Project: EBDU #37
Lab Order: 1909235

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition, EPA and Standard Methods.

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives except where noted in the following. For Anions Analysis, for Batches 92959 and 92978, the recovery of Chloride for the Matrix Spike and Matrix Spike Duplicate(s) (various) was below the method control limits. These are flagged accordingly in the QC Summary Report. This anion was within method control limits in the associated LCS(s). No further corrective action was taken.

For Volatile Organics Analysis, the recovery of Benzene for the Matrix Spike Duplicate (1909277-07 MSD) was below the method control limits. This is flagged accordingly in the QC Summary Report. This compound was within method control limits in the associated LCS. No further corrective action was taken.

DHL Analytical, Inc.

Date: *04-Oct-19*

CLIENT:	Larson & Associates	**Client Sample ID:**	TMW1
Project:	EBDU #37	**Lab ID:**	1909235-01
Project No:	19-0112-49	**Collection Date:**	09/23/19 03:00 PM
Lab Order:	1909235	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
VOLATILE AROMATICS BY GC/MS		**SW8260C**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	10/03/19 04:27 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	10/03/19 04:27 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	10/03/19 04:27 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	10/03/19 04:27 PM
Surr: 1,2-Dichloroethane-d4	93.6	0	72-119		%REC	1	10/03/19 04:27 PM
Surr: 4-Bromofluorobenzene	101	0	76-119		%REC	1	10/03/19 04:27 PM
Surr: Dibromofluoromethane	102	0	85-115		%REC	1	10/03/19 04:27 PM
Surr: Toluene-d8	97.6	0	81-120		%REC	1	10/03/19 04:27 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	37.4	3.00	10.0		mg/L	10	09/27/19 11:38 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	400	10.0	10.0		mg/L	1	09/26/19 05:30 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *04-Oct-19*

CLIENT:	Larson & Associates	**Client Sample ID:**	TMW2
Project:	EBDU #37	**Lab ID:**	1909235-02
Project No:	19-0112-49	**Collection Date:**	09/23/19 05:10 PM
Lab Order:	1909235	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
VOLATILE AROMATICS BY GC/MS		**SW8260C**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	10/03/19 04:53 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	10/03/19 04:53 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	10/03/19 04:53 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	10/03/19 04:53 PM
Surr: 1,2-Dichloroethane-d4	91.7	0	72-119		%REC	1	10/03/19 04:53 PM
Surr: 4-Bromofluorobenzene	97.7	0	76-119		%REC	1	10/03/19 04:53 PM
Surr: Dibromofluoromethane	99.8	0	85-115		%REC	1	10/03/19 04:53 PM
Surr: Toluene-d8	96.3	0	81-120		%REC	1	10/03/19 04:53 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	338	30.0	100		mg/L	100	09/26/19 07:18 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1220	50.0	50.0		mg/L	1	09/26/19 05:30 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc. **Date:** *04-Oct-19*

CLIENT: Larson & Associates
Work Order: 1909235
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_191003A

The QC data in batch 93066 applies to the following samples: 1909235-01A, 1909235-02A

Sample ID **LCS-93066** Batch ID: **93066** TestNo: **SW8260C** Units: **mg/L**
SampType: **LCS** Run ID: **GCMS3_191003A** Analysis Date: **10/3/2019 9:03:00 AM** Prep Date: **10/3/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0467	0.00200	0.0464	0	101	81	122			
Ethylbenzene	0.0486	0.00600	0.0464	0	105	73	127			
Toluene	0.0466	0.00600	0.0464	0	100	77	122			
Total Xylenes	0.151	0.00600	0.139	0	109	80	121			
Surr: 1,2-Dichloroethane-d4	47.8		50.00		95.7	72	119			
Surr: 4-Bromofluorobenzene	50.8		50.00		102	76	119			
Surr: Dibromofluoromethane	51.1		50.00		102	85	115			
Surr: Toluene-d8	49.0		50.00		98.0	81	120			

Sample ID **MB-93066** Batch ID: **93066** TestNo: **SW8260C** Units: **mg/L**
SampType: **MBLK** Run ID: **GCMS3_191003A** Analysis Date: **10/3/2019 9:30:00 AM** Prep Date: **10/3/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	<0.000800	0.00200								
Ethylbenzene	<0.00200	0.00600								
Toluene	<0.00200	0.00600								
Total Xylenes	<0.00200	0.00600								
Surr: 1,2-Dichloroethane-d4	47.4		50.00		94.9	72	119			
Surr: 4-Bromofluorobenzene	50.4		50.00		101	76	119			
Surr: Dibromofluoromethane	50.5		50.00		101	85	115			
Surr: Toluene-d8	48.6		50.00		97.2	81	120			

Sample ID **1909277-07AMS** Batch ID: **93066** TestNo: **SW8260C** Units: **mg/L**
SampType: **MS** Run ID: **GCMS3_191003A** Analysis Date: **10/3/2019 2:44:00 PM** Prep Date: **10/3/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	2.52	0.0400	0.928	1.74	84.5	81	122			
Ethylbenzene	0.957	0.120	0.928	0	103	73	127			
Toluene	1.00	0.120	0.928	0.104	96.6	77	122			
Total Xylenes	2.97	0.120	2.78	0	107	80	121			
Surr: 1,2-Dichloroethane-d4	929		1000		92.9	72	119			
Surr: 4-Bromofluorobenzene	1010		1000		101	76	119			
Surr: Dibromofluoromethane	1000		1000		100	85	115			
Surr: Toluene-d8	968		1000		96.8	81	120			

Sample ID **1909277-07AMSD** Batch ID: **93066** TestNo: **SW8260C** Units: **mg/L**
SampType: **MSD** Run ID: **GCMS3_191003A** Analysis Date: **10/3/2019 3:11:00 PM** Prep Date: **10/3/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 1909235
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_191003A

Sample ID **1909277-07AMSD** Batch ID: **93066** TestNo: **SW8260C** Units: **mg/L**
SampType: **MSD** Run ID: **GCMS3_191003A** Analysis Date: **10/3/2019 3:11:00 PM** Prep Date: **10/3/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	2.46	0.0400	0.928	1.74	78.4	81	122	2.25	20	S
Ethylbenzene	0.908	0.120	0.928	0	97.9	73	127	5.19	20	
Toluene	0.972	0.120	0.928	0.104	93.6	77	122	2.81	20	
Total Xylenes	2.80	0.120	2.78	0	101	80	121	5.89	20	
Surr: 1,2-Dichloroethane-d4	932		1000		93.2	72	119	0	0	
Surr: 4-Bromofluorobenzene	1000		1000		100	76	119	0	0	
Surr: Dibromofluoromethane	1000		1000		100	85	115	0	0	
Surr: Toluene-d8	975		1000		97.5	81	120	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 1909235
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190926A

The QC data in batch 92959 applies to the following samples: 1909235-01B, 1909235-02B

Sample ID	MB-92959	Batch ID:	92959	TestNo:	E300	Units:	mg/L
SampType:	MBLK	Run ID:	IC4_190926A	Analysis Date:	9/26/2019 1:16:18 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID	LCS-92959	Batch ID:	92959	TestNo:	E300	Units:	mg/L
SampType:	LCS	Run ID:	IC4_190926A	Analysis Date:	9/26/2019 1:32:18 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.45	1.00	10.00	0	94.5	90	110			

Sample ID	LCSD-92959	Batch ID:	92959	TestNo:	E300	Units:	mg/L
SampType:	LCSD	Run ID:	IC4_190926A	Analysis Date:	9/26/2019 1:48:18 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.46	1.00	10.00	0	94.6	90	110	0.153	20	

Sample ID	1909208-09CMS	Batch ID:	92959	TestNo:	E300	Units:	mg/L
SampType:	MS	Run ID:	IC4_190926A	Analysis Date:	9/26/2019 9:10:17 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	295	10.0	200.0	116.7	88.9	90	110			S

Sample ID	1909208-09CMSD	Batch ID:	92959	TestNo:	E300	Units:	mg/L
SampType:	MSD	Run ID:	IC4_190926A	Analysis Date:	9/26/2019 9:26:17 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	308	10.0	200.0	116.7	95.5	90	110	4.38	20	

Sample ID	1909208-12CMS	Batch ID:	92959	TestNo:	E300	Units:	mg/L
SampType:	MS	Run ID:	IC4_190926A	Analysis Date:	9/26/2019 9:58:17 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	238	10.0	200.0	68.71	84.6	90	110			S

Sample ID	1909208-12CMSD	Batch ID:	92959	TestNo:	E300	Units:	mg/L
SampType:	MSD	Run ID:	IC4_190926A	Analysis Date:	9/26/2019 10:14:17 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	241	10.0	200.0	68.71	86.3	90	110	1.36	20	S

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 1909235
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_190927A

The QC data in batch 92978 applies to the following samples: 1909235-01B

Sample ID	MB-92978	Batch ID:	92978	TestNo:	E300	Units:	mg/L
SampType:	MBLK	Run ID:	IC4_190927A	Analysis Date:	9/27/2019 11:52:41 AM	Prep Date:	9/27/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID	LCS-92978	Batch ID:	92978	TestNo:	E300	Units:	mg/L
SampType:	LCS	Run ID:	IC4_190927A	Analysis Date:	9/27/2019 12:08:41 PM	Prep Date:	9/27/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.68	1.00	10.00	0	96.8	90	110			

Sample ID	LCSD-92978	Batch ID:	92978	TestNo:	E300	Units:	mg/L
SampType:	LCSD	Run ID:	IC4_190927A	Analysis Date:	9/27/2019 12:24:41 PM	Prep Date:	9/27/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	9.62	1.00	10.00	0	96.2	90	110	0.580	20	

Sample ID	1909253-01BMS	Batch ID:	92978	TestNo:	E300	Units:	mg/L
SampType:	MS	Run ID:	IC4_190927A	Analysis Date:	9/27/2019 6:50:07 PM	Prep Date:	9/27/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	6080	100	2000	4383	84.6	90	110			S

Sample ID	1909253-01BMSD	Batch ID:	92978	TestNo:	E300	Units:	mg/L
SampType:	MSD	Run ID:	IC4_190927A	Analysis Date:	9/27/2019 7:06:07 PM	Prep Date:	9/27/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	6100	100	2000	4383	86.0	90	110	0.462	20	S

Sample ID	1909255-01EMS	Batch ID:	92978	TestNo:	E300	Units:	mg/L
SampType:	MS	Run ID:	IC4_190927A	Analysis Date:	9/27/2019 11:54:07 PM	Prep Date:	9/27/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	598	10.0	200.0	431.8	82.9	90	110			S

Sample ID	1909255-01EMSD	Batch ID:	92978	TestNo:	E300	Units:	mg/L
SampType:	MSD	Run ID:	IC4_190927A	Analysis Date:	9/28/2019 12:10:07 AM	Prep Date:	9/27/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	626	10.0	200.0	431.8	97.1	90	110	4.65	20	

Qualifiers:					
	B	Analyte detected in the associated Method Blank	DF	Dilution Factor	
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit	Page 4 of 5
	ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits	
	RL	Reporting Limit	S	Spike Recovery outside control limits	
	J	Analyte detected between SDL and RL	N	Parameter not NELAP certified	

CLIENT: Larson & Associates
Work Order: 1909235
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: WC_190926A

The QC data in batch 92957 applies to the following samples: 1909235-01B, 1909235-02B

Sample ID	MB-92957	Batch ID:	92957	TestNo:	M2540C	Units:	mg/L
SampType:	MBLK	Run ID:	WC_190926A	Analysis Date:	9/26/2019 5:30:00 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID	LCS-92957	Batch ID:	92957	TestNo:	M2540C	Units:	mg/L
SampType:	LCS	Run ID:	WC_190926A	Analysis Date:	9/26/2019 5:30:00 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	742	10.0	745.6	0	99.5	90	113			

Sample ID	1909204-01E-DUP	Batch ID:	92957	TestNo:	M2540C	Units:	mg/L
SampType:	DUP	Run ID:	WC_190926A	Analysis Date:	9/26/2019 5:30:00 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	2670	50.0	0	2680				0.374	5	

Sample ID	1909204-02E-DUP	Batch ID:	92957	TestNo:	M2540C	Units:	mg/L
SampType:	DUP	Run ID:	WC_190926A	Analysis Date:	9/26/2019 5:30:00 PM	Prep Date:	9/26/2019

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	3680	50.0	0	3735				1.48	5	

Qualifiers:				
	B	Analyte detected in the associated Method Blank	DF	Dilution Factor
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
	RL	Reporting Limit	S	Spike Recovery outside control limits
	J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

January 06, 2020

Mark Larson
Larson & Associates
507 N. Marienfeld #205
Midland, TX 79701
TEL: (432) 687-0901
FAX (432) 687-0456

Order No.: 1912287

RE: EBDU #37

Dear Mark Larson:

DHL Analytical, Inc. received 3 sample(s) on 12/28/2019 for the analyses presented in the following report.

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative and all estimated uncertainties of results are within method specifications.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

John DuPont
General Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number: T104704211-19-24

Table of Contents

№ 0863

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants

507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 12/26/2019 PAGE 1 OF 1
PO#: LAB WORK ORDER#: 191228 7
PROJECT LOCATION OR NAME: EBDU #37
LAI PROJECT #: 19-0112-49 COLLECTOR: DS

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	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 ☐	TBLP - 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 ☐ CYANIDE ☐	pH ☐ HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐ PECHLORATE ☐	CHLORIDE ☒ ANIONS ☐ ALKALINITY ☐	M300	FIELD NOTES
TMW 1	01	12/26/19	1351	W	5	3					X													X		X				
TMW 2	02	12/26/19	1410	W	5	3					X													X		X				
~~Windmill~~ SP-1	03	12/26/19	1200	W	5	3					X													X		X				
TOTAL	3																														

RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)
Daniel A Stefanski	12/27/2019 0810	LSO
LSO	12/28/19 4:15pm	
RELINQUISHED BY:(Signature)	DATE/TIME	RECEIVED BY: (Signature)

LABORATORY: OHL

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

LABORATORY USE ONLY:
RECEIVING TEMP: 4.3 THERM#: 78
CUSTODY SEALS - ☐ BROKEN ☒ INTACT ☐ NOT USED
☐ CARRIER BILL #
☐ HAND DELIVERED

WWW.LSO.COM
Questions? Call 800-800-8984

LSO

Airbill No. LSO0BYGK

LSO0BYGK

1. To: Print Name (Person) | Phone (Important)

Company Name

Street Address (No P.O. Box or P.O. Box Zip Code*Deliveries)

Suite / Floor

City | State | Zip

2. From: Print Name (Person) | Phone (Important)

Company Name

Street Address

Suite / Floor

City | State | Zip

3. Service: Visit www.lso.com for availability of services to your destination and enjoy added features by creating your shipping label online.

- ☒ **LSO Priority Overnight*** By 10:30 a.m. to most cities
- ☐ **LSO Early Overnight*** By 8:30 a.m. select cities
- ☐ **LSO Economy Next Day*** By 3 p.m. to most cities
- ☐ **LSO 2nd Day***
- ☐ **LSO Ground**
- ☒ **LSO Saturday***
- ☐ Other _____

*Check commitment times and availability at www.lso.com

Assumed LSO Priority Overnight service unless otherwise noted.

☐ Deliver Without Delivery Signature (See Limits of Liability below)

Release Signature

L_____ x W_____ x H_____

4. Package: Weight:

Your Company's Billing Reference Information

Ship Date: (mm/dd/yy) 12/27/

5. Payment:

FOR DRIVER USE ONLY

Driver Number: _____

☐ Check here if LSO Supplies are used with LSO Ground Service.

Pick-up Location _____

Date: 12-27-19

Time: 2:30

City Code: DUR

ILLEGIBLE HANDWRITING ON AIRBILL MAY DELAY TRANSIT TIMES OR RESULT IN NON-DELIVERY. LIMIT OF LIABILITY: We are not responsible for claims in excess of $100 for any reason unless you: 1) declare a greater value (not to exceed $25,000); 2) pay an additional fee; 3) and document your actual loss in a timely manner. We will not pay any claim in excess of the actual loss. We are not liable for any special or consequential damages. If you ask us to deliver a package without obtaining a delivery signature, you release us of all liability for claims resulting from such service. "Signature Required" service is only available when printing a label online at LSO.com. **NO DELIVERY SIGNATURE WILL BE OBTAINED FOR LSO EARLY OVERNIGHT SERVICE. Packaging provided by LSO is for EXPRESS USE ONLY – NEVER TO BE USED FOR LSO GROUND Service. OVERSIZE RATES MAY APPLY. DELIVERY COMMITMENTS MAY VARY. ADDITIONAL FEES MAY APPLY.** See LSO Service Guide for [illegible].

CUSTODY SEAL
DATE 12/27/19
SIGNATURE [illegible]

QEC
Quality Environmental Containers
800-255-3950 • www.qecusa.com

DHL Analytical, Inc.

Sample Receipt Checklist

Client Name **Larson & Associates**

Date Received: **12/30/2019**

Work Order Number **1912287**

Received by: **AH**

Checklist completed by: _____ 12/30/2019
Signature | Date

Reviewed by _____ 12/30/2019
Initials | Date

Carrier name: LSO Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shippping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	**4.3** °C
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH<2 acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____
Water - ph>9 (S) or ph>10 (CN) acceptable upon receipt?	Yes ☐	No ☐	NA ☑ LOT #
	Adjusted? _____		Checked by _____

Any No response must be detailed in the comments section below.

Client contacted: _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

Page 1 of 1

DHL Analytical, Inc. **Date:** *06-Jan-20*

CLIENT: Larson & Associates
Project: EBDU #37
Lab Order: 1912287

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition, EPA and Standard Methods.

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

DHL Analytical, Inc.

Date: *06-Jan-20*

CLIENT:	Larson & Associates	**Client Sample ID:**	TMW1
Project:	EBDU #37	**Lab ID:**	1912287-01
Project No:	16-0112-49	**Collection Date:**	12/26/19 01:31 PM
Lab Order:	1912287	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
VOLATILE AROMATICS BY GC/MS		**SW8260D**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	01/02/20 08:05 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:05 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:05 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:05 PM
Surr: 1,2-Dichloroethane-d4	101	0	72-119		%REC	1	01/02/20 08:05 PM
Surr: 4-Bromofluorobenzene	100	0	76-119		%REC	1	01/02/20 08:05 PM
Surr: Dibromofluoromethane	104	0	85-115		%REC	1	01/02/20 08:05 PM
Surr: Toluene-d8	102	0	81-120		%REC	1	01/02/20 08:05 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	21.1	0.300	1.00		mg/L	1	01/03/20 06:29 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	390	10.0	10.0		mg/L	1	12/31/19 02:00 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *06-Jan-20*

CLIENT:	Larson & Associates	**Client Sample ID:**	TMW2
Project:	EBDU #37	**Lab ID:**	1912287-02
Project No:	16-0112-49	**Collection Date:**	12/26/19 02:10 PM
Lab Order:	1912287	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
VOLATILE AROMATICS BY GC/MS		**SW8260D**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	01/02/20 08:31 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:31 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:31 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:31 PM
Surr: 1,2-Dichloroethane-d4	102	0	72-119		%REC	1	01/02/20 08:31 PM
Surr: 4-Bromofluorobenzene	104	0	76-119		%REC	1	01/02/20 08:31 PM
Surr: Dibromofluoromethane	103	0	85-115		%REC	1	01/02/20 08:31 PM
Surr: Toluene-d8	101	0	81-120		%REC	1	01/02/20 08:31 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	307	3.00	10.0		mg/L	10	01/03/20 01:52 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	1170	50.0	50.0		mg/L	1	12/31/19 02:00 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc.

Date: *06-Jan-20*

CLIENT:	Larson & Associates	**Client Sample ID:**	SP-1
Project:	EBDU #37	**Lab ID:**	1912287-03
Project No:	16-0112-49	**Collection Date:**	12/26/19 12:00 PM
Lab Order:	1912287	**Matrix:**	AQUEOUS

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
VOLATILE AROMATICS BY GC/MS		**SW8260D**					Analyst: **BTJ**
Benzene	<0.000800	0.000800	0.00200		mg/L	1	01/02/20 08:56 PM
Ethylbenzene	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:56 PM
Toluene	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:56 PM
Total Xylenes	<0.00200	0.00200	0.00600		mg/L	1	01/02/20 08:56 PM
Surr: 1,2-Dichloroethane-d4	98.8	0	72-119		%REC	1	01/02/20 08:56 PM
Surr: 4-Bromofluorobenzene	101	0	76-119		%REC	1	01/02/20 08:56 PM
Surr: Dibromofluoromethane	102	0	85-115		%REC	1	01/02/20 08:56 PM
Surr: Toluene-d8	101	0	81-120		%REC	1	01/02/20 08:56 PM
ANIONS BY IC METHOD - WATER		**E300**					Analyst: **SNM**
Chloride	259	3.00	10.0		mg/L	10	01/03/20 02:08 PM
TOTAL DISSOLVED SOLIDS		**M2540C**					Analyst: **JS**
Total Dissolved Solids (Residue, Filterable)	688	10.0	10.0		mg/L	1	12/31/19 02:00 PM

Qualifiers:	*	Value exceeds TCLP Maximum Concentration Level	C	Sample Result or QC discussed in the Case Narrative
	DF	Dilution Factor	E	TPH pattern not Gas or Diesel Range Pattern
	J	Analyte detected between MDL and RL	MDL	Method Detection Limit
	ND	Not Detected at the Method Detection Limit	RL	Reporting Limit
	S	Spike Recovery outside control limits	N	Parameter not NELAP certified

DHL Analytical, Inc. **Date:** *06-Jan-20*

CLIENT: Larson & Associates
Work Order: 1912287
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_200102A

The QC data in batch 94359 applies to the following samples: 1912287-01A, 1912287-02A, 1912287-03A

Sample ID: **LCS-94359** Batch ID: **94359** TestNo: **SW8260D** Units: **mg/L**
SampType: **LCS** Run ID: **GCMS3_200102A** Analysis Date: **1/2/2020 12:42:00 PM** Prep Date: **1/2/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0522	0.00200	0.0464	0	112	81	122			
Ethylbenzene	0.0481	0.00600	0.0464	0	104	73	127			
Toluene	0.0508	0.00600	0.0464	0	110	77	122			
Total Xylenes	0.148	0.00600	0.139	0	107	80	121			
Surr: 1,2-Dichloroethane-d4	50.2		50.00		100	72	119			
Surr: 4-Bromofluorobenzene	51.0		50.00		102	76	119			
Surr: Dibromofluoromethane	50.8		50.00		102	85	115			
Surr: Toluene-d8	51.1		50.00		102	81	120			

Sample ID: **MB-94359** Batch ID: **94359** TestNo: **SW8260D** Units: **mg/L**
SampType: **MBLK** Run ID: **GCMS3_200102A** Analysis Date: **1/2/2020 1:08:00 PM** Prep Date: **1/2/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	<0.000800	0.00200								
Ethylbenzene	<0.00200	0.00600								
Toluene	<0.00200	0.00600								
Total Xylenes	<0.00200	0.00600								
Surr: 1,2-Dichloroethane-d4	50.4		50.00		101	72	119			
Surr: 4-Bromofluorobenzene	50.8		50.00		102	76	119			
Surr: Dibromofluoromethane	51.3		50.00		103	85	115			
Surr: Toluene-d8	51.0		50.00		102	81	120			

Sample ID: **1912277-07AMS** Batch ID: **94359** TestNo: **SW8260D** Units: **mg/L**
SampType: **MS** Run ID: **GCMS3_200102A** Analysis Date: **1/2/2020 5:03:00 PM** Prep Date: **1/2/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0446	0.00200	0.0464	0	96.1	81	122			
Ethylbenzene	0.0411	0.00600	0.0464	0	88.5	73	127			
Toluene	0.0434	0.00600	0.0464	0	93.6	77	122			
Total Xylenes	0.127	0.00600	0.139	0	91.2	80	121			
Surr: 1,2-Dichloroethane-d4	49.2		50.00		98.5	72	119			
Surr: 4-Bromofluorobenzene	51.1		50.00		102	76	119			
Surr: Dibromofluoromethane	51.1		50.00		102	85	115			
Surr: Toluene-d8	51.2		50.00		102	81	120			

Sample ID: **1912277-07AMSD** Batch ID: **94359** TestNo: **SW8260D** Units: **mg/L**
SampType: **MSD** Run ID: **GCMS3_200102A** Analysis Date: **1/2/2020 5:29:00 PM** Prep Date: **1/2/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 1912287
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: GCMS3_200102A

Sample ID: **1912277-07AMSD** Batch ID: **94359** TestNo: **SW8260D** Units: **mg/L**
SampType: **MSD** Run ID: **GCMS3_200102A** Analysis Date: **1/2/2020 5:29:00 PM** Prep Date: **1/2/2020**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.0433	0.00200	0.0464	0	93.3	81	122	2.96	20	
Ethylbenzene	0.0394	0.00600	0.0464	0	85.0	73	127	4.04	20	
Toluene	0.0420	0.00600	0.0464	0	90.4	77	122	3.42	20	
Total Xylenes	0.118	0.00600	0.139	0	84.7	80	121	7.46	20	
Surr: 1,2-Dichloroethane-d4	49.9		50.00		99.8	72	119	0	0	
Surr: 4-Bromofluorobenzene	49.7		50.00		99.4	76	119	0	0	
Surr: Dibromofluoromethane	51.2		50.00		102	85	115	0	0	
Surr: Toluene-d8	50.9		50.00		102	81	120	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 1912287
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: IC4_200103A

The QC data in batch 94365 applies to the following samples: 1912287-01B, 1912287-02B, 1912287-03B

Sample ID: MB-94365	Batch ID: 94365	TestNo: E300	Units: mg/L
SampType: MBLK	Run ID: IC4_200103A	Analysis Date: 1/3/2020 11:17:22 AM	Prep Date: 1/3/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	<0.300	1.00								

Sample ID: LCS-94365	Batch ID: 94365	TestNo: E300	Units: mg/L
SampType: LCS	Run ID: IC4_200103A	Analysis Date: 1/3/2020 11:33:22 AM	Prep Date: 1/3/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.5	1.00	10.00	0	105	90	110			

Sample ID: LCSD-94365	Batch ID: 94365	TestNo: E300	Units: mg/L
SampType: LCSD	Run ID: IC4_200103A	Analysis Date: 1/3/2020 11:49:22 AM	Prep Date: 1/3/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	10.3	1.00	10.00	0	103	90	110	1.27	20	

Sample ID: 1912287-01BMS	Batch ID: 94365	TestNo: E300	Units: mg/L
SampType: MS	Run ID: IC4_200103A	Analysis Date: 1/3/2020 6:45:51 PM	Prep Date: 1/3/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	39.1	1.00	20.00	21.08	89.9	90	110			

Sample ID: 1912287-01BMSD	Batch ID: 94365	TestNo: E300	Units: mg/L
SampType: MSD	Run ID: IC4_200103A	Analysis Date: 1/3/2020 7:01:51 PM	Prep Date: 1/3/2020

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	39.0	1.00	20.00	21.08	89.6	90	110	0.155	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

CLIENT: Larson & Associates
Work Order: 1912287
Project: EBDU #37

ANALYTICAL QC SUMMARY REPORT

RunID: WC_191231B

The QC data in batch 94343 applies to the following samples: 1912287-01B, 1912287-02B, 1912287-03B

Sample ID: **MB-94343**	Batch ID: **94343**	TestNo: **M2540C**	Units: **mg/L**
SampType: **MBLK**	Run ID: **WC_191231B**	Analysis Date: **12/31/2019 2:00:00 PM**	Prep Date: **12/31/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	<10.0	10.0								

Sample ID: **LCS-94343**	Batch ID: **94343**	TestNo: **M2540C**	Units: **mg/L**
SampType: **LCS**	Run ID: **WC_191231B**	Analysis Date: **12/31/2019 2:00:00 PM**	Prep Date: **12/31/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	743	10.0	745.6	0	99.7	90	113			

Sample ID: **1912286-01A-DUP**	Batch ID: **94343**	TestNo: **M2540C**	Units: **mg/L**
SampType: **DUP**	Run ID: **WC_191231B**	Analysis Date: **12/31/2019 2:00:00 PM**	Prep Date: **12/31/2019**

Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids (Residue, Filtera	985	50.0	0	1000				1.51	5	

Qualifiers:

B	Analyte detected in the associated Method Blank	DF	Dilution Factor
J	Analyte detected between MDL and RL	MDL	Method Detection Limit
ND	Not Detected at the Method Detection Limit	R	RPD outside accepted control limits
RL	Reporting Limit	S	Spike Recovery outside control limits
J	Analyte detected between SDL and RL	N	Parameter not NELAP certified

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Certificate of Analysis Summary 674147

Larson and Associates, Inc., Midland, TX

Project Name: EBD4 37

Project Id: 19-0112-49
Contact: Mark Larson
Project Location:

Date Received in Lab: Fri 10.02.2020 09:20
Report Date: 10.08.2020 16:22
Project Manager: Holly Taylor

Analysis Requested		674147-001		674147-002		674147-003		674147-004		674147-005		674147-006	
	Lab Id:	674147-001		674147-002		674147-003		674147-004		674147-005		674147-006	
	Field Id:	TMW-2		TMW-1		Stock Tank		TMW-3		TMW-4		Dup-1	
	Depth:												
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	Sampled:	09.30.2020 11:15		09.30.2020 12:00		09.30.2020 12:30		09.30.2020 13:00		09.30.2020 13:30		09.30.2020 15:00	
BTEX by EPA 8021B	*Extracted:*	10.04.2020 10:30		10.04.2020 10:30		10.04.2020 10:30		10.04.2020 10:30		10.04.2020 10:30		10.04.2020 10:30	
	Analyzed:	10.04.2020 14:01		10.06.2020 05:49		10.04.2020 14:42		10.04.2020 15:02		10.04.2020 15:23		10.06.2020 06:51	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Benzene		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Toluene		0.00227	0.00200	<0.00200	0.00200	<0.00200	0.00200	0.00322	0.00200	0.00314	0.00200	<0.00200	0.00200
Ethylbenzene		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
m,p-Xylenes		<0.00400	0.00400	<0.00400	0.00400	<0.00400	0.00400	0.00448	0.00400	<0.00400	0.00400	<0.00400	0.00400
o-Xylene		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Total Xylenes		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	0.00448	0.00200	<0.00200	0.00200	<0.00200	0.00200
Total BTEX		0.00227	0.00200	<0.00200	0.00200	<0.00200	0.00200	0.00770	0.00200	0.00314	0.00200	<0.00200	0.00200
Chloride by EPA 300	*Extracted:*	10.02.2020 15:10		10.02.2020 15:10		10.02.2020 15:10		10.02.2020 15:10		10.02.2020 15:10		10.02.2020 15:10	
	Analyzed:	10.02.2020 23:54		10.02.2020 23:59		10.03.2020 00:05		10.03.2020 00:11		10.03.2020 00:16		10.03.2020 00:22	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Chloride		314	5.00	22.6	2.50	274	2.50	212	5.00	1020	10.0	276	2.50
TDS by SM2540C	*Extracted:*												
	Analyzed:	10.05.2020 15:45		10.05.2020 15:45		10.05.2020 15:45		10.05.2020 15:45		10.05.2020 15:45		10.05.2020 15:45	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Total Dissolved Solids		1040	5.00	390	5.00	730	5.00	891	5.00	2040	5.00	794	5.00

BRL - Below Reporting Limit

Jessica Kramer

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

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Analytical Report 674147

for

Larson and Associates, Inc.

Project Manager: Mark Larson

EBD4 37

19-0112-49

10.08.2020

Collected By: Client

1211 W. Florida Ave
Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-20-38), Arizona (AZ0765), Florida (E871002-33), Louisiana (03054)
Oklahoma (2020-014), North Carolina (681), Arkansas (20-035-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-20-26), Arizona (AZ0809)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-20-18)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-20-23)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-21)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-20-8)
Xenco-Tampa: Florida (E87429), North Carolina (483)

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10.08.2020

Project Manager: **Mark Larson**
Larson and Associates, Inc.
P. O. Box 50685
Midland, TX 79710

Reference: Eurofins Xenco, LLC Report No(s): **674147**
EBD4 37
Project Address:

Mark Larson :

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the Eurofins Xenco, LLC Report Number(s) 674147. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by Eurofins Xenco, LLC. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 674147 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting Eurofins Xenco, LLC to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Jessica Kramer

Jessica Kramer
Project Manager

A Small Business and Minority Company

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

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Sample Cross Reference 674147

Larson and Associates, Inc., Midland, TX

EBD4 37

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
TMW-2	W	09.30.2020 11:15		674147-001
TMW-1	W	09.30.2020 12:00		674147-002
Stock Tank	W	09.30.2020 12:30		674147-003
TMW-3	W	09.30.2020 13:00		674147-004
TMW-4	W	09.30.2020 13:30		674147-005
Dup-1	W	09.30.2020 15:00		674147-006

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CASE NARRATIVE

Client Name: Larson and Associates, Inc.

Project Name: EBD4 37

Project ID: *19-0112-49*
Work Order Number(s): *674147*

Report Date: *10.08.2020*
Date Received: *10.02.2020*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

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Certificate of Analytical Results 674147

Larson and Associates, Inc., Midland, TX

EBD4 37

Sample Id: **TMW-2** Matrix: Water Date Received:10.02.2020 09:20

Lab Sample Id: 674147-001 Date Collected: 09.30.2020 11:15

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 10.02.2020 15:10 % Moisture:

Seq Number: 3138810

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**314**	5.00	mg/L	10.02.2020 23:54		10

Analytical Method: TDS by SM2540C

Tech: CHE

Analyst: CHE % Moisture:

Seq Number: 3138888

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**1040**	5.00	mg/L	10.05.2020 15:45		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: KTL

Analyst: KTL Date Prep: 10.04.2020 10:30 % Moisture:

Seq Number: 3138793

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	10.04.2020 14:01	U	1
Toluene	108-88-3	**0.00227**	0.00200	mg/L	10.04.2020 14:01		1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	10.04.2020 14:01	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	10.04.2020 14:01	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	10.04.2020 14:01	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	10.04.2020 14:01	U	1
Total BTEX		**0.00227**	0.00200	mg/L	10.04.2020 14:01		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	102	%	70-130	10.04.2020 14:01	
4-Bromofluorobenzene	460-00-4	102	%	70-130	10.04.2020 14:01	

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Certificate of Analytical Results 674147

Larson and Associates, Inc., Midland, TX

EBD4 37

Sample Id: **TMW-1** Matrix: Water Date Received:10.02.2020 09:20

Lab Sample Id: 674147-002 Date Collected: 09.30.2020 12:00

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 10.02.2020 15:10 % Moisture:

Seq Number: 3138810

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**22.6**	2.50	mg/L	10.02.2020 23:59		5

Analytical Method: TDS by SM2540C

Tech: CHE

Analyst: CHE % Moisture:

Seq Number: 3138888

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**390**	5.00	mg/L	10.05.2020 15:45		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: KTL

Analyst: KTL Date Prep: 10.04.2020 10:30 % Moisture:

Seq Number: 3138793

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	10.06.2020 05:49	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	10.06.2020 05:49	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	10.06.2020 05:49	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	10.06.2020 05:49	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	10.06.2020 05:49	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	10.06.2020 05:49	U	1
Total BTEX		<0.00200	0.00200	mg/L	10.06.2020 05:49	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.06.2020 05:49	
4-Bromofluorobenzene	460-00-4	84	%	70-130	10.06.2020 05:49	

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Certificate of Analytical Results 674147

Larson and Associates, Inc., Midland, TX

EBD4 37

Sample Id: **Stock Tank** Matrix: Water Date Received:10.02.2020 09:20

Lab Sample Id: 674147-003 Date Collected: 09.30.2020 12:30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 10.02.2020 15:10 % Moisture:

Seq Number: 3138810

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**274**	2.50	mg/L	10.03.2020 00:05		5

Analytical Method: TDS by SM2540C

Tech: CHE

Analyst: CHE % Moisture:

Seq Number: 3138888

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**730**	5.00	mg/L	10.05.2020 15:45		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: KTL

Analyst: KTL Date Prep: 10.04.2020 10:30 % Moisture:

Seq Number: 3138793

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	10.04.2020 14:42	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	10.04.2020 14:42	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	10.04.2020 14:42	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	10.04.2020 14:42	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	10.04.2020 14:42	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	10.04.2020 14:42	U	1
Total BTEX		<0.00200	0.00200	mg/L	10.04.2020 14:42	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.04.2020 14:42	
4-Bromofluorobenzene	460-00-4	104	%	70-130	10.04.2020 14:42	

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Certificate of Analytical Results 674147

Larson and Associates, Inc., Midland, TX

EBD4 37

Sample Id: **TMW-3** Matrix: Water Date Received:10.02.2020 09:20

Lab Sample Id: 674147-004 Date Collected: 09.30.2020 13:00

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 10.02.2020 15:10 % Moisture:

Seq Number: 3138810

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**212**	5.00	mg/L	10.03.2020 00:11		10

Analytical Method: TDS by SM2540C

Tech: CHE

Analyst: CHE % Moisture:

Seq Number: 3138888

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**891**	5.00	mg/L	10.05.2020 15:45		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: KTL

Analyst: KTL Date Prep: 10.04.2020 10:30 % Moisture:

Seq Number: 3138793

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	10.04.2020 15:02	U	1
Toluene	108-88-3	**0.00322**	0.00200	mg/L	10.04.2020 15:02		1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	10.04.2020 15:02	U	1
m,p-Xylenes	179601-23-1	**0.00448**	0.00400	mg/L	10.04.2020 15:02		1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	10.04.2020 15:02	U	1
Total Xylenes	1330-20-7	**0.00448**	0.00200	mg/L	10.04.2020 15:02		1
Total BTEX		**0.00770**	0.00200	mg/L	10.04.2020 15:02		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	100	%	70-130	10.04.2020 15:02	
4-Bromofluorobenzene	460-00-4	105	%	70-130	10.04.2020 15:02	

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Certificate of Analytical Results 674147

Larson and Associates, Inc., Midland, TX

EBD4 37

Sample Id: **TMW-4** Matrix: Water Date Received:10.02.2020 09:20

Lab Sample Id: 674147-005 Date Collected: 09.30.2020 13:30

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 10.02.2020 15:10 % Moisture:

Seq Number: 3138810

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**1020**	10.0	mg/L	10.03.2020 00:16		20

Analytical Method: TDS by SM2540C

Tech: CHE

Analyst: CHE % Moisture:

Seq Number: 3138888

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**2040**	5.00	mg/L	10.05.2020 15:45		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: KTL

Analyst: KTL Date Prep: 10.04.2020 10:30 % Moisture:

Seq Number: 3138793

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	10.04.2020 15:23	U	1
Toluene	108-88-3	**0.00314**	0.00200	mg/L	10.04.2020 15:23		1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	10.04.2020 15:23	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	10.04.2020 15:23	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	10.04.2020 15:23	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	10.04.2020 15:23	U	1
Total BTEX		**0.00314**	0.00200	mg/L	10.04.2020 15:23		1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	101	%	70-130	10.04.2020 15:23	
4-Bromofluorobenzene	460-00-4	106	%	70-130	10.04.2020 15:23	

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Certificate of Analytical Results 674147

Larson and Associates, Inc., Midland, TX

EBD4 37

Sample Id: **Dup-1** Matrix: Water Date Received:10.02.2020 09:20

Lab Sample Id: 674147-006 Date Collected: 09.30.2020 15:00

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 10.02.2020 15:10 % Moisture:

Seq Number: 3138810

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**276**	2.50	mg/L	10.03.2020 00:22		5

Analytical Method: TDS by SM2540C

Tech: CHE

Analyst: CHE % Moisture:

Seq Number: 3138888

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**794**	5.00	mg/L	10.05.2020 15:45		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: KTL

Analyst: KTL Date Prep: 10.04.2020 10:30 % Moisture:

Seq Number: 3138793

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	10.06.2020 06:51	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	10.06.2020 06:51	U	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	10.06.2020 06:51	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	10.06.2020 06:51	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	10.06.2020 06:51	U	1
Total Xylenes	1330-20-7	<0.00200	0.00200	mg/L	10.06.2020 06:51	U	1
Total BTEX		<0.00200	0.00200	mg/L	10.06.2020 06:51	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	102	%	70-130	10.06.2020 06:51	
4-Bromofluorobenzene	460-00-4	92	%	70-130	10.06.2020 06:51	

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Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit. **ND** Not Detected.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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QC Summary 674147

Larson and Associates, Inc.

EBD4 37

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3138810 — Matrix: Water — Date Prep: 10.02.2020
MB Sample Id: 7712552-1-BLK — LCS Sample Id: 7712552-1-BKS — LCSD Sample Id: 7712552-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	26.8	107	26.3	105	90-110	2	20	mg/L	10.02.2020 21:38	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3138810 — Matrix: Water — Date Prep: 10.02.2020
Parent Sample Id: 674014-001 — MS Sample Id: 674014-001 S — MSD Sample Id: 674014-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	281	250	560	112	547	106	90-110	2	20	mg/L	10.02.2020 23:14	X

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3138810 — Matrix: Ground Water — Date Prep: 10.02.2020
Parent Sample Id: 674100-005 — MS Sample Id: 674100-005 S — MSD Sample Id: 674100-005 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	310	125	478	134	465	124	90-110	3	20	mg/L	10.02.2020 21:55	X

Analytical Method: TDS by SM2540C
Seq Number: 3138888 — Matrix: Water
MB Sample Id: 3138888-1-BLK — LCS Sample Id: 3138888-1-BKS — LCSD Sample Id: 3138888-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	<5.00	1000	989	99	961	96	80-120	3	10	mg/L	10.05.2020 15:45	

Analytical Method: TDS by SM2540C
Seq Number: 3138888 — Matrix: Water
Parent Sample Id: 674147-001 — MD Sample Id: 674147-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	1040	1040	0	10	mg/L	10.05.2020 15:45	

MS/MSD Percent Recovery [D] = 100*(C-A) / B
Relative Percent Difference RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery [D] = 100 * (C) / [B]
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

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QC Summary 674147

Larson and Associates, Inc.

EBD4 37

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3138793 Matrix: Water Date Prep: 10.04.2020
MB Sample Id: 7712592-1-BLK LCS Sample Id: 7712592-1-BKS LCSD Sample Id: 7712592-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.0934	93	0.0908	91	70-130	3	25	mg/L	10.04.2020 10:56	
Toluene	<0.00200	0.100	0.0899	90	0.0871	87	70-130	3	25	mg/L	10.04.2020 10:56	
Ethylbenzene	<0.00200	0.100	0.0983	98	0.0939	94	70-130	5	25	mg/L	10.04.2020 10:56	
m,p-Xylenes	<0.00400	0.200	0.201	101	0.192	96	70-130	5	25	mg/L	10.04.2020 10:56	
o-Xylene	<0.00200	0.100	0.0980	98	0.0946	95	70-130	4	25	mg/L	10.04.2020 10:56	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	98		97		98		70-130	%	10.04.2020 10:56
4-Bromofluorobenzene	100		96		97		70-130	%	10.04.2020 10:56

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3138793 Matrix: Ground Water Date Prep: 10.04.2020
Parent Sample Id: 674046-014 MS Sample Id: 674046-014 S MSD Sample Id: 674046-014 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.0958	96	0.104	104	70-130	8	25	mg/L	10.04.2020 11:37	
Toluene	<0.00200	0.100	0.0921	92	0.0992	99	70-130	7	25	mg/L	10.04.2020 11:37	
Ethylbenzene	<0.00200	0.100	0.100	100	0.110	110	70-130	10	25	mg/L	10.04.2020 11:37	
m,p-Xylenes	<0.00400	0.200	0.206	103	0.224	112	70-130	8	25	mg/L	10.04.2020 11:37	
o-Xylene	<0.00200	0.100	0.100	100	0.110	110	70-130	10	25	mg/L	10.04.2020 11:37	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	95		96		70-130	%	10.04.2020 11:37
4-Bromofluorobenzene	93		97		70-130	%	10.04.2020 11:37

MS/MSD Percent Recovery [D] = 100*(C-A) / B
Relative Percent Difference RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery [D] = 100 * (C) / [B]
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

~~674147~~ 674149 № 1358

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 10/2/20 PAGE 1 OF 1

PO#: _____ LAB WORK ORDER#: _____

PROJECT LOCATION OR NAME: EBD4 37

LAI PROJECT #: 19-0112-49 COLLECTOR: DS

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MNT

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

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	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 ☐	TBLP - 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 ☐ CYANIDE ☐	pH ☐ HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐ PECHLORATE ☐	CHLORIDE ☒ ANIONS ☐ ALKALINITY ☐	FIELD NOTES
TMW-2		9/30/20	1115	W	5	X			X		X														X			X		
TMW-1		9/30/20	1200	W	5	X			X		X														X			X		
Stock tank		9/30/20	1230	W	5	X			X		X														X			X		
TMW-3		9/30/20	1300	W	5	X			X		X														X			X		BILL DIRECT TO
TMW-4		9/30/20	1330	W	5	X			X		X														X			X		APACHE
DUP-1		9/30/20	1500	W	5	X			X		X														X			X		
TOTAL					6																									

RELINQUISHED BY:(Signature) DS DATE/TIME 10/2/20 0920 RECEIVED BY: (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: 3.2°C THERM#: _____
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL # _____
☐ HAND DELIVERED

Eurofins Xenco, LLC

Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 10.02.2020 09.20.00 AM

Work Order #: 674147

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR-8

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	3.2	
#2 *Shipping container in good condition?	**Yes**	
#3 *Samples received on ice?	**Yes**	
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**	
#5 Custody Seals intact on sample bottles?	**N/A**	
#6*Custody Seals Signed and dated?	**N/A**	
#7 *Chain of Custody present?	**Yes**	
#8 Any missing/extra samples?	**No**	
#9 Chain of Custody signed when relinquished/ received?	**Yes**	
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**	
#11 Container label(s) legible and intact?	**Yes**	
#12 Samples in proper container/ bottle?	**Yes**	
#13 Samples properly preserved?	**Yes**	
#14 Sample container(s) intact?	**Yes**	
#15 Sufficient sample amount for indicated test(s)?	**Yes**	Limited sample client brought a 250 cool for TDS
#16 All samples received within hold time?	**Yes**	
#17 Subcontract of sample(s)?	**N/A**	
#18 Water VOC samples have zero headspace?	**Yes**	

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: AJA PH Device/Lot#: 10BHD1991

Checklist completed by: Brianna Teel Date: 10.02.2020

Brianna Teel

Checklist reviewed by: Holly Taylor Date: 10.05.2020

Holly Taylor

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Certificate of Analysis Summary 680330

Larson and Associates, Inc., Midland, TX

Project Name: EBDU 37

Project Id: 19-0112-49
Contact: Mark Larson
Project Location:

Date Received in Lab: Wed 12.09.2020 08:51
Report Date: 12.16.2020 09:36
Project Manager: Holly Taylor

Analysis Requested													
	Lab Id:	680330-001		680330-002		680330-003		680330-004		680330-005		680330-006	
	Field Id:	TMW-1		TMW-3		TMW-2		TMW-4		Windmill		DUP-1	
	Depth:												
	Matrix:	WATER		WATER		WATER		WATER		WATER		WATER	
	Sampled:	12.07.2020 10:02		12.07.2020 10:43		12.07.2020 11:20		12.07.2020 11:57		12.07.2020 11:57		12.07.2020 00:00	
BTEX by EPA 8021B	***Extracted:***	12.10.2020 15:00		12.10.2020 15:00		12.10.2020 15:00		12.10.2020 15:00		12.10.2020 15:00		12.10.2020 15:00	
	Analyzed:	12.11.2020 05:08		12.11.2020 05:34		12.11.2020 06:00		12.11.2020 06:25		12.11.2020 06:52		12.11.2020 07:17	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Benzene		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Toluene		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Ethylbenzene		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
m,p-Xylenes		<0.00400	0.00400	<0.00400	0.00400	<0.00400	0.00400	<0.00400	0.00400	<0.00400	0.00400	<0.00400	0.00400
o-Xylene		<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200	<0.00200	0.00200
Total Xylenes		<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000
Total BTEX		<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000	<0.002000	0.002000
Chloride by EPA 300	***Extracted:***	12.10.2020 15:15		12.10.2020 15:15		12.10.2020 15:15		12.10.2020 15:15		12.10.2020 15:15		12.10.2020 15:15	
	Analyzed:	12.10.2020 18:02		12.10.2020 18:07		12.10.2020 18:12		12.10.2020 18:42		12.10.2020 18:47		12.10.2020 22:45	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Chloride		13.1	2.50	214	5.00	298	5.00	987	10.0	287	2.50	278	2.50
TDS by SM2540C	***Extracted:***												
	Analyzed:	12.10.2020 15:11		12.10.2020 15:11		12.10.2020 15:11		12.10.2020 15:11		12.10.2020 15:11		12.10.2020 15:11	
	Units/RL:	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL	mg/L	RL
Total Dissolved Solids		383	5.00	948	5.00	1050	5.00	2300	5.00	930	5.00	908	5.00

BRL - Below Reporting Limit

Holly Taylor

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

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Analytical Report 680330

for

Larson and Associates, Inc.

Project Manager: Mark Larson

EBDU 37

19-0112-49

12.16.2020

Collected By: Client

1211 W. Florida Ave
Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-20-38), Arizona (AZ0765), Florida (E871002-33), Louisiana (03054)
Oklahoma (2020-014), North Carolina (681), Arkansas (20-035-0)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-20-26), Arizona (AZ0809)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-20-18)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-20-23)
Xenco-Midland (EPA Lab Code: TX00158): Texas (T104704400-19-21)
Xenco-Carlsbad (LELAP): Louisiana (05092)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-20-8)
Xenco-Tampa: Florida (E87429), North Carolina (483)

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12.16.2020

Project Manager: **Mark Larson**
Larson and Associates, Inc.
P. O. Box 50685
Midland, TX 79710

Reference: Eurofins Xenco, LLC Report No(s): **680330**
EBDU 37
Project Address:

Mark Larson:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the Eurofins Xenco, LLC Report Number(s) 680330. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by Eurofins Xenco, LLC. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 680330 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting Eurofins Xenco, LLC to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Holly Taylor

Holly Taylor
Project Manager

A Small Business and Minority Company

Houston - Dallas - Midland - Tampa - Phoenix - Lubbock - San Antonio - El Paso - Atlanta - New Mexico

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Sample Cross Reference 680330

Larson and Associates, Inc., Midland, TX

EBDU 37

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
TMW-1	W	12.07.2020 10:02		680330-001
TMW-3	W	12.07.2020 10:43		680330-002
TMW-2	W	12.07.2020 11:20		680330-003
TMW-4	W	12.07.2020 11:57		680330-004
Windmill	W	12.07.2020 11:57		680330-005
DUP-1	W	12.07.2020 00:00		680330-006

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CASE NARRATIVE

Client Name: Larson and Associates, Inc.

Project Name: EBDU 37

Project ID: *19-0112-49*
Work Order Number(s): *680330*

Report Date: *12.16.2020*
Date Received: *12.09.2020*

Sample receipt non conformances and comments:

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3144538 BTEX by EPA 8021B

Surrogate 1,4-Difluorobenzene recovered above QC limits. Samples affected are: 7716864-1-BKS,7716864-1-BSD,680330-001 S,680330-001 SD,680330-004,680330-003,680330-002,680330-005,680330-006.

Surrogate 4-Bromofluorobenzene recovered above QC limits. Samples affected are: 7716864-1-BSD,680330-001,680330-003,680330-004,680330-005,680330-006.

Toluene RPD was outside laboratory control limits.

Samples in the analytical batch are: 680330-001, -002, -003, -004, -005, -006

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Certificate of Analytical Results 680330

Larson and Associates, Inc., Midland, TX

EBDU 37

Sample Id: **TMW-1** Matrix: Water Date Received:12.09.2020 08:51

Lab Sample Id: 680330-001 Date Collected: 12.07.2020 10:02

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 12.10.2020 15:15 % Moisture:

Seq Number: 3144579

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**13.1**	2.50	mg/L	12.10.2020 18:02		5

Analytical Method: TDS by SM2540C

Tech: SPC

Analyst: SPC % Moisture:

Seq Number: 3144605

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**383**	5.00	mg/L	12.10.2020 15:11		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: MNR

Analyst: MNR Date Prep: 12.10.2020 15:00 % Moisture:

Seq Number: 3144538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	12.11.2020 05:08	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	12.11.2020 05:08	UF	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	12.11.2020 05:08	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	12.11.2020 05:08	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	12.11.2020 05:08	U	1
Total Xylenes	1330-20-7	<0.002000	0.002000	mg/L	12.11.2020 05:08	U	1
Total BTEX		<0.002000	0.002000	mg/L	12.11.2020 05:08	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	85	%	70-130	12.11.2020 05:08	
4-Bromofluorobenzene	460-00-4	146	%	70-130	12.11.2020 05:08	**

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Certificate of Analytical Results 680330

Larson and Associates, Inc., Midland, TX

EBDU 37

Sample Id: **TMW-3** Matrix: Water Date Received:12.09.2020 08:51

Lab Sample Id: 680330-002 Date Collected: 12.07.2020 10:43

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 12.10.2020 15:15 % Moisture:

Seq Number: 3144579

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**214**	5.00	mg/L	12.10.2020 18:07		10

Analytical Method: TDS by SM2540C

Tech: SPC

Analyst: SPC % Moisture:

Seq Number: 3144605

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**948**	5.00	mg/L	12.10.2020 15:11		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: MNR

Analyst: MNR Date Prep: 12.10.2020 15:00 % Moisture:

Seq Number: 3144538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	12.11.2020 05:34	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	12.11.2020 05:34	UF	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	12.11.2020 05:34	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	12.11.2020 05:34	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	12.11.2020 05:34	U	1
Total Xylenes	1330-20-7	<0.002000	0.002000	mg/L	12.11.2020 05:34	U	1
Total BTEX		<0.002000	0.002000	mg/L	12.11.2020 05:34	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	180	%	70-130	12.11.2020 05:34	**
4-Bromofluorobenzene	460-00-4	115	%	70-130	12.11.2020 05:34	

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Certificate of Analytical Results 680330

Larson and Associates, Inc., Midland, TX

EBDU 37

Sample Id: **TMW-2** Matrix: Water Date Received:12.09.2020 08:51

Lab Sample Id: 680330-003 Date Collected: 12.07.2020 11:20

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 12.10.2020 15:15 % Moisture:

Seq Number: 3144579

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**298**	5.00	mg/L	12.10.2020 18:12		10

Analytical Method: TDS by SM2540C

Tech: SPC

Analyst: SPC % Moisture:

Seq Number: 3144605

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**1050**	5.00	mg/L	12.10.2020 15:11		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: MNR

Analyst: MNR Date Prep: 12.10.2020 15:00 % Moisture:

Seq Number: 3144538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	12.11.2020 06:00	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	12.11.2020 06:00	UF	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	12.11.2020 06:00	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	12.11.2020 06:00	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	12.11.2020 06:00	U	1
Total Xylenes	1330-20-7	<0.002000	0.002000	mg/L	12.11.2020 06:00	U	1
Total BTEX		<0.002000	0.002000	mg/L	12.11.2020 06:00	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	200	%	70-130	12.11.2020 06:00	**
4-Bromofluorobenzene	460-00-4	136	%	70-130	12.11.2020 06:00	**

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Certificate of Analytical Results 680330

Larson and Associates, Inc., Midland, TX

EBDU 37

Sample Id: **TMW-4** Matrix: Water Date Received:12.09.2020 08:51

Lab Sample Id: 680330-004 Date Collected: 12.07.2020 11:57

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 12.10.2020 15:15 % Moisture:

Seq Number: 3144579

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**987**	10.0	mg/L	12.10.2020 18:42		20

Analytical Method: TDS by SM2540C

Tech: SPC

Analyst: SPC % Moisture:

Seq Number: 3144605

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**2300**	5.00	mg/L	12.10.2020 15:11		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: MNR

Analyst: MNR Date Prep: 12.10.2020 15:00 % Moisture:

Seq Number: 3144538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	12.11.2020 06:25	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	12.11.2020 06:25	UF	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	12.11.2020 06:25	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	12.11.2020 06:25	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	12.11.2020 06:25	U	1
Total Xylenes	1330-20-7	<0.002000	0.002000	mg/L	12.11.2020 06:25	U	1
Total BTEX		<0.002000	0.002000	mg/L	12.11.2020 06:25	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	205	%	70-130	12.11.2020 06:25	**
4-Bromofluorobenzene	460-00-4	131	%	70-130	12.11.2020 06:25	**

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Certificate of Analytical Results 680330

Larson and Associates, Inc., Midland, TX

EBDU 37

Sample Id: **Windmill** Matrix: Water Date Received:12.09.2020 08:51

Lab Sample Id: 680330-005 Date Collected: 12.07.2020 11:57

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 12.10.2020 15:15 % Moisture:

Seq Number: 3144579

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**287**	2.50	mg/L	12.10.2020 18:47		5

Analytical Method: TDS by SM2540C

Tech: SPC

Analyst: SPC % Moisture:

Seq Number: 3144605

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**930**	5.00	mg/L	12.10.2020 15:11		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: MNR

Analyst: MNR Date Prep: 12.10.2020 15:00 % Moisture:

Seq Number: 3144538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	12.11.2020 06:52	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	12.11.2020 06:52	UF	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	12.11.2020 06:52	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	12.11.2020 06:52	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	12.11.2020 06:52	U	1
Total Xylenes	1330-20-7	<0.002000	0.002000	mg/L	12.11.2020 06:52	U	1
Total BTEX		<0.002000	0.002000	mg/L	12.11.2020 06:52	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	175	%	70-130	12.11.2020 06:52	**
4-Bromofluorobenzene	460-00-4	134	%	70-130	12.11.2020 06:52	**

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Certificate of Analytical Results 680330

Larson and Associates, Inc., Midland, TX

EBDU 37

Sample Id: **DUP-1** Matrix: Water Date Received:12.09.2020 08:51

Lab Sample Id: 680330-006 Date Collected: 12.07.2020 00:00

Analytical Method: Chloride by EPA 300 Prep Method: E300P

Tech: CHE

Analyst: CHE Date Prep: 12.10.2020 15:15 % Moisture:

Seq Number: 3144579

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Chloride	16887-00-6	**278**	2.50	mg/L	12.10.2020 22:45		5

Analytical Method: TDS by SM2540C

Tech: SPC

Analyst: SPC % Moisture:

Seq Number: 3144605

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Total Dissolved Solids	1642222	**908**	5.00	mg/L	12.10.2020 15:11		1

Analytical Method: BTEX by EPA 8021B Prep Method: SW5030B

Tech: MNR

Analyst: MNR Date Prep: 12.10.2020 15:00 % Moisture:

Seq Number: 3144538

Parameter	Cas Number	Result	RL	Units	Analysis Date	Flag	Dil
Benzene	71-43-2	<0.00200	0.00200	mg/L	12.11.2020 07:17	U	1
Toluene	108-88-3	<0.00200	0.00200	mg/L	12.11.2020 07:17	UF	1
Ethylbenzene	100-41-4	<0.00200	0.00200	mg/L	12.11.2020 07:17	U	1
m,p-Xylenes	179601-23-1	<0.00400	0.00400	mg/L	12.11.2020 07:17	U	1
o-Xylene	95-47-6	<0.00200	0.00200	mg/L	12.11.2020 07:17	U	1
Total Xylenes	1330-20-7	<0.002000	0.002000	mg/L	12.11.2020 07:17	U	1
Total BTEX		<0.002000	0.002000	mg/L	12.11.2020 07:17	U	1

Surrogate	Cas Number	% Recovery	Units	Limits	Analysis Date	Flag
1,4-Difluorobenzene	540-36-3	200	%	70-130	12.11.2020 07:17	**
4-Bromofluorobenzene	460-00-4	136	%	70-130	12.11.2020 07:17	**

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Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit. **ND** Not Detected.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

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QC Summary 680330

Larson and Associates, Inc.

EBDU 37

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3144579 — Matrix: Water — Date Prep: 12.10.2020
MB Sample Id: 7716819-1-BLK — LCS Sample Id: 7716819-1-BKS — LCSD Sample Id: 7716819-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	<0.500	25.0	26.4	106	26.4	106	90-110	0	20	mg/L	12.10.2020 16:22	

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3144579 — Matrix: Drinking Water — Date Prep: 12.10.2020
Parent Sample Id: 680611-001 — MS Sample Id: 680611-001 S — MSD Sample Id: 680611-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	15.9	25.0	44.5	114	43.4	110	90-110	3	20	mg/L	12.10.2020 16:47	X

Analytical Method: Chloride by EPA 300 — Prep Method: E300P
Seq Number: 3144579 — Matrix: Drinking Water — Date Prep: 12.10.2020
Parent Sample Id: 680614-001 — MS Sample Id: 680614-001 S — MSD Sample Id: 680614-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Chloride	12.8	25.0	40.8	112	40.2	110	90-110	1	20	mg/L	12.10.2020 18:26	X

Analytical Method: TDS by SM2540C
Seq Number: 3144605 — Matrix: Water
MB Sample Id: 3144605-1-BLK — LCS Sample Id: 3144605-1-BKS — LCSD Sample Id: 3144605-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	<5.00	1000	999	100	995	100	80-120	0	10	mg/L	12.10.2020 15:11	

Analytical Method: TDS by SM2540C
Seq Number: 3144605 — Matrix: Water
Parent Sample Id: 680330-001 — MD Sample Id: 680330-001 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	383	385	1	10	mg/L	12.10.2020 15:11	

Analytical Method: TDS by SM2540C
Seq Number: 3144605 — Matrix: Ground Water
Parent Sample Id: 680549-005 — MD Sample Id: 680549-005 D

Parameter	Parent Result	MD Result	%RPD	RPD Limit	Units	Analysis Date	Flag
Total Dissolved Solids	655	660	1	10	mg/L	12.10.2020 15:11	

MS/MSD Percent Recovery — [D] = 100*(C-A) / B
Relative Percent Difference — RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery — [D] = 100 * (C) / [B]
Log Difference — Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample — MS = Matrix Spike
A = Parent Result — B = Spike Added
C = MS/LCS Result — D = MSD/LCSD % Rec
E = MSD/LCSD Result

QC Summary 680330

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Larson and Associates, Inc.

EBDU 37

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3144538 Matrix: Water Date Prep: 12.10.2020
MB Sample Id: 7716864-1-BLK LCS Sample Id: 7716864-1-BKS LCSD Sample Id: 7716864-1-BSD

Parameter	MB Result	Spike Amount	LCS Result	LCS %Rec	LCSD Result	LCSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.107	107	0.0935	94	70-130	13	25	mg/L	12.11.2020 02:07	
Toluene	<0.00200	0.100	0.112	112	0.0813	81	70-130	32	25	mg/L	12.11.2020 02:07	F
Ethylbenzene	<0.00200	0.100	0.110	110	0.0900	90	70-130	20	25	mg/L	12.11.2020 02:07	
m,p-Xylenes	<0.00400	0.200	0.223	112	0.185	93	70-130	19	25	mg/L	12.11.2020 02:07	
o-Xylene	<0.00200	0.100	0.111	111	0.0983	98	70-130	12	25	mg/L	12.11.2020 02:07	

Surrogate	MB %Rec	MB Flag	LCS %Rec	LCS Flag	LCSD %Rec	LCSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	90		147	**	163	**	70-130	%	12.11.2020 02:07
4-Bromofluorobenzene	105		118		133	**	70-130	%	12.11.2020 02:07

Analytical Method: **BTEX by EPA 8021B** Prep Method: SW5030B
Seq Number: 3144538 Matrix: Water Date Prep: 12.10.2020
Parent Sample Id: 680330-001 MS Sample Id: 680330-001 S MSD Sample Id: 680330-001 SD

Parameter	Parent Result	Spike Amount	MS Result	MS %Rec	MSD Result	MSD %Rec	Limits	%RPD	RPD Limit	Units	Analysis Date	Flag
Benzene	<0.00200	0.100	0.112	112	0.110	110	70-130	2	25	mg/L	12.11.2020 02:59	
Toluene	<0.00200	0.100	0.0939	94	0.112	112	70-130	18	25	mg/L	12.11.2020 02:59	
Ethylbenzene	<0.00200	0.100	0.108	108	0.111	111	70-130	3	25	mg/L	12.11.2020 02:59	
m,p-Xylenes	<0.00400	0.200	0.221	111	0.228	114	70-130	3	25	mg/L	12.11.2020 02:59	
o-Xylene	<0.00200	0.100	0.112	112	0.115	115	70-130	3	25	mg/L	12.11.2020 02:59	

Surrogate	MS %Rec	MS Flag	MSD %Rec	MSD Flag	Limits	Units	Analysis Date
1,4-Difluorobenzene	160	**	151	**	70-130	%	12.11.2020 02:59
4-Bromofluorobenzene	120		130		70-130	%	12.11.2020 02:59

MS/MSD Percent Recovery [D] = 100*(C-A) / B
Relative Percent Difference RPD = 200* | (C-E) / (C+E) |
LCS/LCSD Recovery [D] = 100 * (C) / [B]
Log Difference Log Diff. = Log(Sample Duplicate) - Log(Original Sample)

LCS = Laboratory Control Sample
A = Parent Result
C = MS/LCS Result
E = MSD/LCSD Result

MS = Matrix Spike
B = Spike Added
D = MSD/LCSD % Rec

№ 1429

6800330

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
507 N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to:

DATE: 12/8/20 PAGE 1 OF 1

PO#: LAB WORK ORDER#:

PROJECT LOCATION OR NAME: EBDU 37

LAI PROJECT #: 19-0112-49 COLLECTOR: TJ + KN

TRRP report? ☐ Yes ☒ No

TIME ZONE: Time zone/State: MST

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

Field Sample I.D.	Lab #	Date	Time	Matrix	# of Containers	PRESERVATION: HCl	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE	UNPRESSERVED	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 ☐	TBLP - 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 ☐ CYANIDE ☐	pH ☐ HEXAVALENT CHROMIUM ☐	EXPLOSIVES ☐ PECHLORATE ☐	CHLORIDES ☒ ANIONS ☐ ALKALINITY ☐	FIELD NOTES
TMW-1		12/7/20	1002	W	5	X			X		X																X			X		
TMW-3			1043																													
TMW-2			1120																													
TMW-4			1157																													
windmill		12/8/20	1157																													
DUP-1																																

TOTAL 6

(RELINQUISHED BY:(Signature) Kenda Collins — DATE/TIME — RECEIVED BY: (Signature)

RELINQUISHED BY:(Signature) Tulin Ceyhan — DATE/TIME 12/9/20 8:51 a.m. — 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: 5.9c THERM#: IR-8
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☒ NOT USED
☐ CARRIER BILL #
☑ HAND DELIVERED

Eurofins Xenco, LLC

Prelogin/Nonconformance Report- Sample Log-In

Client: Larson and Associates, Inc.

Date/ Time Received: 12.09.2020 08.51.00 AM

Work Order #: 680330

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : IR8

Sample Receipt Checklist	Comments
#1 *Temperature of cooler(s)?	5.9
#2 *Shipping container in good condition?	**Yes**
#3 *Samples received on ice?	**Yes**
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**
#5 Custody Seals intact on sample bottles?	**N/A**
#6*Custody Seals Signed and dated?	**N/A**
#7 *Chain of Custody present?	**Yes**
#8 Any missing/extra samples?	**No**
#9 Chain of Custody signed when relinquished/ received?	**Yes**
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**
#11 Container label(s) legible and intact?	**Yes**
#12 Samples in proper container/ bottle?	**Yes**
#13 Samples properly preserved?	**Yes**
#14 Sample container(s) intact?	**Yes**
#15 Sufficient sample amount for indicated test(s)?	**Yes**
#16 All samples received within hold time?	**Yes**
#17 Subcontract of sample(s)?	**N/A**
#18 Water VOC samples have zero headspace?	**Yes**

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: JKR PH Device/Lot#: 10BDH1991

Checklist completed by: Brianna Teel Date: 12.09.2020

Brianna Teel

Checklist reviewed by: Holly Taylor Date: 12.09.2020

Holly Taylor

1RP-5636
2021
First (1st) Quarter
GROUNDWATER MONITORING REPORT
(January – March)

East Blinebry Drinkard Unit #37
Lea County, New Mexico

Latitude: N 32.47956°
Longitude: W -103.12206°

LAI Project No. 19-0112-49

April 20, 2021

Prepared for:
Apache Corporation
303 Veterans Airpark Lane
Midland, Texas 79705

Prepared by:
Larson & Associates, Inc.
507 North Marienfeld Street, Suite 202
Midland, Texas 79701

Mark J. Larson, P.G.
Certified Professional Geologist #10490

Daniel A. St. Germain
Staff Geologist

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Table of Contents

1.0 EXECUTIVE SUMMARY

Larson & Associates, Inc. (LAI) has prepared this first quarter groundwater monitoring report on behalf of Apache Corporation (Apache) for submittal to the New Mexico Oil Conservation Division (OCD) District 1 in Hobbs and Santa Fe, New Mexico. This report presents the 2021 first quarter (January – March) groundwater gauging summary and laboratory analysis of groundwater samples collected from four (4) monitor wells (TMW-1, TMW-2, TMW-3, and TMW-4) and a windmill at the East Blinebry Drinkard Unit (EBDU) #37 (Site) located in Lea County, New Mexico. The geodetic position is North 32.479569° and West -103.122061°.

The following groundwater monitoring activities occurred on March 11, 2021:

- Gauged depth to ground water in four (4) monitor wells (TMW-1 through TMW-4).
- Purged and collected groundwater samples from four (4) monitor wells (TMW-1 through TMW-4).
- Collect groundwater samples from a windmill located south from the Site.
- Analyzed groundwater samples for benzene, toluene, ethylbenzene, and xylenes (BTEX), total dissolved solids (TDS), and chloride.

The following observations are documented in this report:

- No significant changes were observed in potentiometric surface elevation, flow direction, or gradient during the monitoring period.
- Groundwater flow was from north to south at gradients between 0.0012 feet per foot (ft/ft) and 0.0019 ft/ft.
- BTEX was not reported above the analytical method reporting limits (RL) or New Mexico Water Quality Control Commission (WQCC) human health standards in groundwater samples collected on March 11, 2021.
- Chloride was reported above the WQCC domestic water quality standard of 250 milligrams per liter (mg/L) in groundwater samples collected from wells TMW-2 (293 mg/L), TMW-4 (834 mg/L), and the windmill (252 mg/L).
- TDS was reported above the WQCC domestic water quality standard of 1,000 mg/L in the groundwater sample collected from well TMW-4 (1960 mg/L).

Apache will continue quarterly monitoring of groundwater in wells TMW-1 through TMW-4 and the windmill during 2021 with laboratory analysis of groundwater samples for BTEX, TDS, and chloride. Notice will be provided to OCD in Hobbs and Santa Fe, New Mexico at least 5 working days prior to each groundwater monitoring event. OCD will be notified immediately upon receipt laboratory analysis with significant increase of analyte concentrations.

2.0 INTRODUCTION

Larson & Associates, Inc. (LAI), on behalf of Apache Corporation (Apache), has prepared this first quarter groundwater monitoring report for submittal to the New Mexico Oil Conservation Division (OCD) District 1 in Hobbs and Santa Fe, New Mexico. This report presents the first quarter laboratory analysis of groundwater samples collected from monitor wells (TMW-1, TMW-2, TMW-3, TMW-4) and a windmill at the East Blinebry Drinkard Unit (EBDU) #37 (Site) located in Lea County, New Mexico. The geodetic

position is North 32.479569° and West -103.122061°. Figure 1 presents a topographic map. Figure 2 presents an aerial map.

2.1 Background

The spill originated from a flowline at a pipeline junction located about 720 feet east from Well #37. Produced fluids (oil and water) flowed west about 350 feet west from the release origin, and south about 450 feet before terminating in low-lying area. The volume of the release and recovered fluid are unknown. The spill is designated as a major release due to the unknown volume of the release. The spill covered an area measuring about 31,320 square feet or about 0.72 acres. The initial C-141 was submitted on July 26, 2019 and was assigned remediation permit number 1RP-5636. Appendix A presents the initial C-141.

On October 29, 2019, Apache submitted to the OCD a remediation plan titled, "1RP-5636 REMEDIATION PLAN, East Blinebry Drinkard Unit #37 Produced water Spill, Lea County, New Mexico, October 29, 2019". On December 23, 2019, OCD approved an addendum to the remediation plan based on a telephone call on December 20, 2019, with the following conditions:

- Apache will install a boring in the bottom of the excavation to delineate the vertical extent of chloride in soil. Soil samples will be collected beginning at the bottom of the excavation and every five (5) feet thereafter until chloride decreases below 600 mg/Kg or groundwater is encountered.
- Apache will install two (2) additional monitoring wells at locations shown on the attached drawing. The monitoring wells will be constructed similar to monitoring well TMW-1 and TMW-2 with about 20 feet of screen placed above and below the groundwater level observed during drilling. Groundwater is expected to occur around 50 feet bgs therefore the borings will be advanced to around 70 feet bgs.
- Survey wells for top of elevation (top of casing and ground) for groundwater potentiometric surface elevation, flow direction and gradient.
- Apache will close the excavation at Area 1 according to the remediation plan dated October 29, 2019.
- Apache will close the excavation at Area 2, based on the laboratory results of samples from the boring to be placed in the bottom of the excavation, by filling the excavation to approximately 5 feet bgs with clean caliche, installing a 20-mill thickness polyethylene liner at approximately 5 feet bgs and backfilling to surface with clean topsoil.
- Seed Area 1 and Area 2 following remediation according to landowner requirement.
- Perform quarterly groundwater monitoring (5 wells) and reporting.

Appendix B presents the OCD communications.

2.2 Monitoring Well Installations

On September 29, 2019, Scarborough Drilling Inc. (SDI), under LAI supervision, installed two (2) monitoring wells (TMW-1 and TMW-2) under permits issued by the State of New Mexico Office of the State Engineer. Monitoring wells TMW-3 and TMW-4 were repositioned to avoid removing thick vegetation and/or crossing underground pipelines. Monitoring well TMW-3 was repositioned about 100 feet west from its original location. Monitoring well TMW-4 was repositioned about 30 feet east from its original location. OCD approved the relocation of the monitoring wells September 22, 2020. Appendix B presents OCD communications.

Monitoring wells TMW-3 and TMW-4 were drilled to approximately 68.41 feet bgs and 70.09 feet bgs, respectively. Both wells were completed with two (2) inch threaded schedule 40 PVC casing and approximately twenty (20) feet of 0.01-inch factory slotted screen. The screens were positioned above and below the groundwater level observed during drilling. Graded silica sand was placed around the well screens to about two (2) feet above the screens. The remaining annulus above the screens was filled to about 1-foot bgs with bentonite chips and hydrated with potable water. The wells are secured with locking steel covers.

The monitor wells (TMW-1 through TMW-4) were surveyed by West Company, a State of New Mexico Licensed Professional Land Surveyor (LPS Number 23263) for geodetic position and elevation, including surface elevation and top of casing (TOC) elevation. Figure 2 presents the monitoring well locations. Appendix C presents the boring logs and monitoring well completion records.

3.0 DEPTH TO GROUNDWATER AND GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION

On March 11, 2021, depth to groundwater was gauged in wells TMW-1 through TMW-4. Groundwater was measured at 49.41 (TMW-1), 58.0 (TMW-2), 57.59 (TMW-3), and 57.4 (TMW-4) feet below top of casing (TOC). The groundwater potentiometric surface elevation ranged from 3,366.16 feet above mean sea level (MSL) at TMW-2 (up gradient) to 3,365.16 above MSL at TMW-1 (down gradient). Groundwater flow from north to south at gradients between 0.0012 feet per foot (ft/ft) and 0.0019 ft/ft.

No significant changes in potentiometric surface elevation, flow direction, or gradient were observed on March 11, 2021. Figure 3 presents the groundwater potentiometric surface map on March 11, 2021. Table 1 presents monitor well construction and gauging summary.

4.0 GROUNDWATER SAMPLES AND ANALYSIS

On March 10, 2021 LAI personnel collected groundwater samples from monitoring wells TMW-1 through TMW-4, using the low stress or low flow method following 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 flow rate until environmental parameters stabilize.

Groundwater samples were collected from discharge through 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. The samples were transferred to labeled laboratory containers, packed in an ice chest filled with ice, and delivered under chain of custody control to Xenco Laboratories (Xenco), a National Environmental Laboratory Accreditation Conference (NELAC) accredited laboratory, located in Midland, Texas. A duplicate sample was collected from the windmill 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, total dissolved solids (TDS) by Method SM 2540C, and chloride by EPA Method 300. Table 2 presents the laboratory analytical summary. Appendix B presents the laboratory report.

4.1 Organic Analysis

Xenco reported BTEX concentrations below the laboratory analytical reporting limit (RL) and New Mexico Water Quality Control Commission (WQCC) human health standards in groundwater samples from TMW-1 through TMW-4 and windmill March 11, 2021. The results are consistent with the results from previous groundwater monitoring events.

4.2 Inorganic Analysis

Chloride concentrations remain above the WQCC domestic water quality standard (250 mg/L) in samples collected from monitoring wells TMW-2 (293 mg/L), TMW-4 (834 mg/L), and the windmill (252 mg/L). Chloride concentrations were below WQCC domestic water quality standards in monitoring wells TMW-1 (10.9 mg/L) and TMW-2 (213 mg/L), and consistent with previous monitoring events. The duplicate (QA/QC) sample (Dup-1) collected from the windmill is within 2.8 percent (259 mg/L) of the original chloride value (252 mg/L) for the windmill. No data quality exceptions were noted in Xenco case narratives. Figure 4 presents the chloride isopleth map for March 11, 2021.

TDS concentrations remain above the WQCC domestic water quality standard (1,000 mg/L) in samples collected from TMW-2 (1,000 mg/L) and TMW-4 (1,960 mg/L). TDS concentrations remain below the WQCC domestic water quality standards in monitoring wells TMW-1 (360 mg/L), TMW-3, (900 mg/L), and the windmill (745 mg/L). Figure 5 presents the TDS isopleth map for March 11, 2021.

5.0 CONCLUSIONS

The following observations are made in this report:

- The groundwater flow direction was from north to south at gradients between approximately 0.0012 and 0.0019 ft/ft.
- No significant changes were observed in potentiometric surface elevation, flow direction, or gradient during the monitoring period.
- BTEX was reported below the analytical reporting limit and WQCC human health standards in groundwater samples collected from TMW-1 through TMW-4.
- Chloride concentrations were reported above WQCC domestic water quality standard (250 mg/L) in groundwater samples collected from TMW-2 (293 mg/L), TMW-4 (834 mg/L), and the windmill (252 mg/L).
- TDS concentrations were reported above the WQCC domestic water quality standard (1,000 mg/L) in groundwater samples collected from TMW-2 (1,000 mg/L) and TMW-4 (1,960 mg/L).

- Apache will continue quarterly monitoring of groundwater in wells TMW-1 through TMW-4 and the windmill during 2021 with laboratory analysis of groundwater samples for BTEX, chloride and TDS.

Notice will be provided to OCD in Hobbs and Santa Fe, New Mexico at least 7 working days prior to each groundwater monitoring event. The OCD will be notified immediately upon receipt of laboratory analysis with significant increase of analyte concentrations.

Tables

Table 1
1RP-5636
Monitoring Well Completion and Gauging Summary
Apache Corportaion, EBDU #37
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)
TMW-1	09/19/2019	74.36	71.00	2	3411.21	42.32 - 61.97	3.36	3,414.57	09/23/2019	46.18	42.82	28.18	3,368.39
									12/26/2019	48.90	45.54	26.27	3,365.67
									09/30/2020	49.31	45.95	25.05	3,365.26
									12/07/2020	49.42	46.06	24.94	3,365.15
									03/11/2021	49.41	46.05	24.95	3,365.16
TMW-2	09/19/2019	82.86	80.00	2	3421.30	47.50 - 67.50	2.86	3,424.16	09/23/2019	55.80	52.94	27.06	3,368.36
									12/26/2019	57.50	54.64	25.36	3,366.66
									09/30/2020	58.01	55.15	24.85	3,366.15
									12/07/2020	58.08	55.22	24.78	3,366.08
									03/11/2021	58.00	55.14	24.86	3,366.16
TWM-3	09/29/2020	71.29	68.41	2	3420.33	49.96 - 68.41	2.88	3,423.21	09/23/2019	--	--	--	--
									12/26/2020	--	--	--	--
									09/30/2020	57.62	54.74	13.67	3,365.59
									12/07/2020	57.68	54.80	13.61	3,365.53
									03/11/2021	57.59	54.71	13.70	3,365.62
TMW-4	09/29/2020	73.25	70.09	2	3420.03	49.96 - 69.76	3.16	3,423.19	09/23/2019	--	--	--	--
									12/26/2019	--	--	--	--
									09/30/2020	57.39	54.23	15.86	3,365.80
									12/07/2020	57.45	54.29	15.80	3,365.74
									03/11/2021	57.40	54.24	15.85	3,365.79

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
1RP-5636
Groundwater Sample Analytical Data Summary
Apache Corporation, EBDU 37, 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)	Depth To Water (Feet TOC)
NMWQCC Standard:		*0.005	*1	*0.7	*0.62	**250	**1,000	
Windmill	(') 08/01/2019	<0.001	<0.001	<0.001	<0.003	232	732	--
	(²) 09/23/2019	--	--	--	--	--	--	--
	(²) 12/26/2019	<0.000800	<0.00200	<0.00200	<0.00200	**259**	688	--
	(³) 09/30/2020	<0.00200	<0.00200	<0.00200	<0.00200	**274**	730	--
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**287**	930	--
	(³) 03/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	**252**	745	--
TMW-1	(²) 09/23/2019	<0.00800	<0.00200	<0.00200	<0.00200	37.4	400	46.18
	(²) 12/26/2019	<0.000800	<0.00200	<0.00200	<0.00200	21.1	390	48.9
	(³) 09/30/2020	<0.00200	<0.00200	<0.00200	<0.00200	22.6	390	49.31
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	13.1	383	49.42
	(³) 03/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	10.9	360	
TMW-2	(²) 09/23/2019	<0.00800	<0.00200	<0.00200	<0.00200	**338**	**1,220**	55.8
	(²) 12/26/2019	<0.000800	<0.00200	<0.00200	<0.00200	**307**	**1,170**	57.5
	(³) 09/30/2020	<0.00200	0.00227	<0.00200	<0.00200	**314**	**1,040**	58.01
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**298**	**1,050**	58.06
	(³) 03/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	**293**	**1,000**	
TMW-3	09/23/2019	--	--	--	--	--	--	--
	12/26/2019	--	--	--	--	--	--	--
	(³) 09/30/2020	<0.00200	0.00322	<0.00200	0.00448	212	891	57.62
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	214	948	57.68
	(³) 03/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	213	900	
TMW-4	09/23/2019	--	--	--	--	--	--	--
	12/26/2019	--	--	--	--	--	--	--
	(³) 09/30/2020	<0.00200	0.00314	<0.00200	<0.00200	**1,020**	**2,040**	57.39
	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**987**	**2,300**	57.45
	(³) 03/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	**834**	**1,960**	
DUP-1 (Windmill)	(³) 09/30/2020	<0.00200	<0.00200	<0.00200	<0.00200	**276**	794	--
DUP-1 (Windmill)	(³) 12/07/2020	<0.00200	<0.00200	<0.00200	<0.00200	**278**	908	--
DUP-1 (Windmill)	(³) 03/11/2021	<0.00200	<0.00200	<0.00200	<0.00400	**259**	798	--

Table 2
1RP-5636
Groundwater Sample Analytical Data Summary
Apache Corporation, EBDU 37, Lea County, New Mexico

Notes:
('): analysis performed by Cardinal Laboratories, Hobbs, New Mexico, by EPA SW-846 Method 8021B (BTEX) and titration methods (chloride and TDS).
([2]): analysis performed by DHL Analytical, Round Rock, Texas, by EPA SW-846 Method 8021B (BTEX) and Method 300 (chloride).
([3]): analysis performed by Xenco Laboratories, Midland, Texas, by EPA SW-846 Method 8021B (BTEX) and Method 300 (chloride).
([4]): anaylis performed by Eurofins-Xenco, Midland, Texas, by EPA SW-846 Method 8021B (BTEX) and Method 300 (chloride). Units reported as ug/L in report, converted to mg/L.
< values: concentration is less than method reporting limit (RL).
*: NMWQCC Human Health Standard
**: NMWQCC Domestic Water Quality Standard
--: no data available
TOC: top of casing
All values reported in milligrams per liter (mg/L) equivalent to parts per million (ppm)
Bold and highlighted denotes analyte concentration exceeds NMWQCC domestic water quality standard

Figures

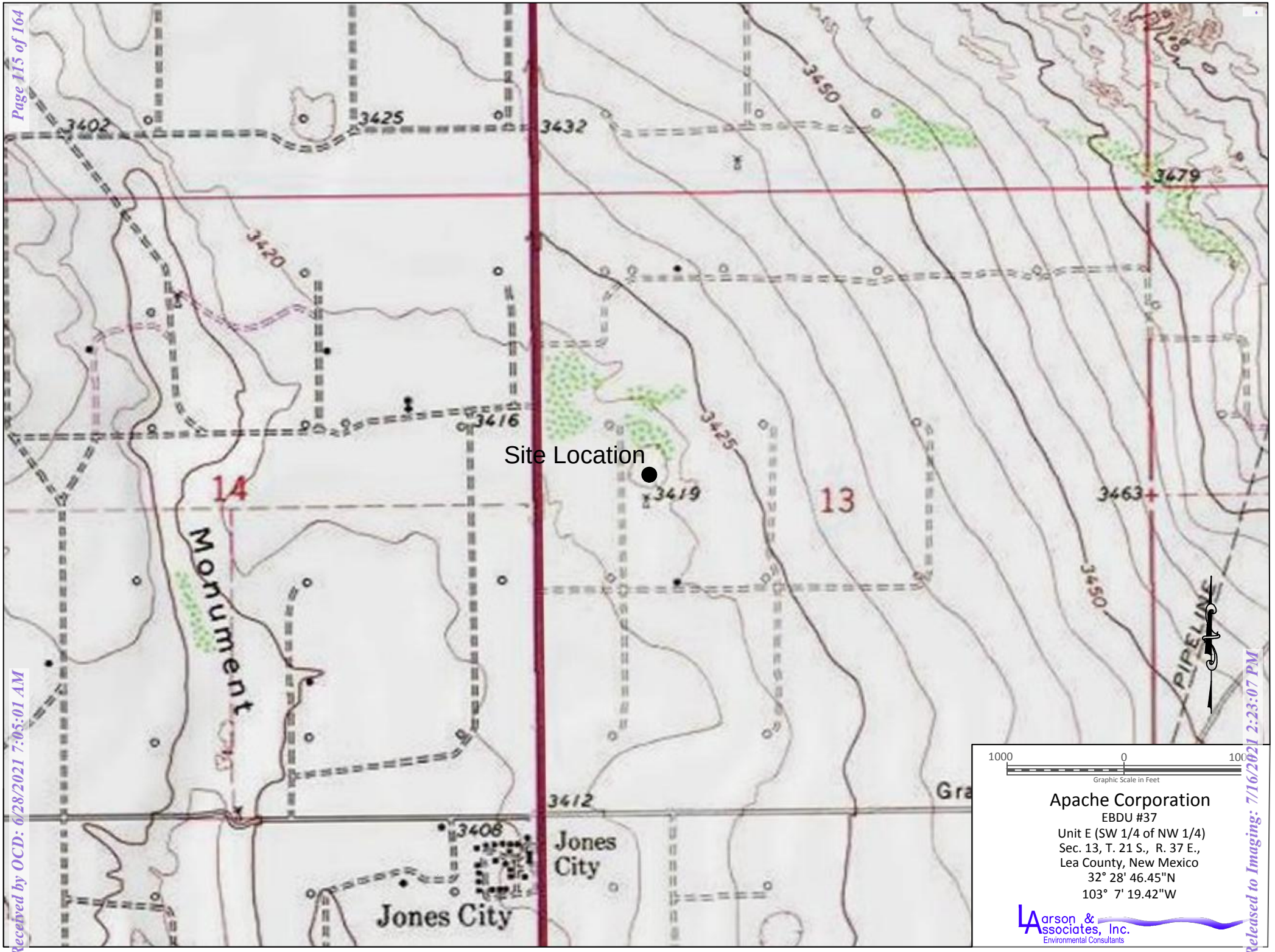
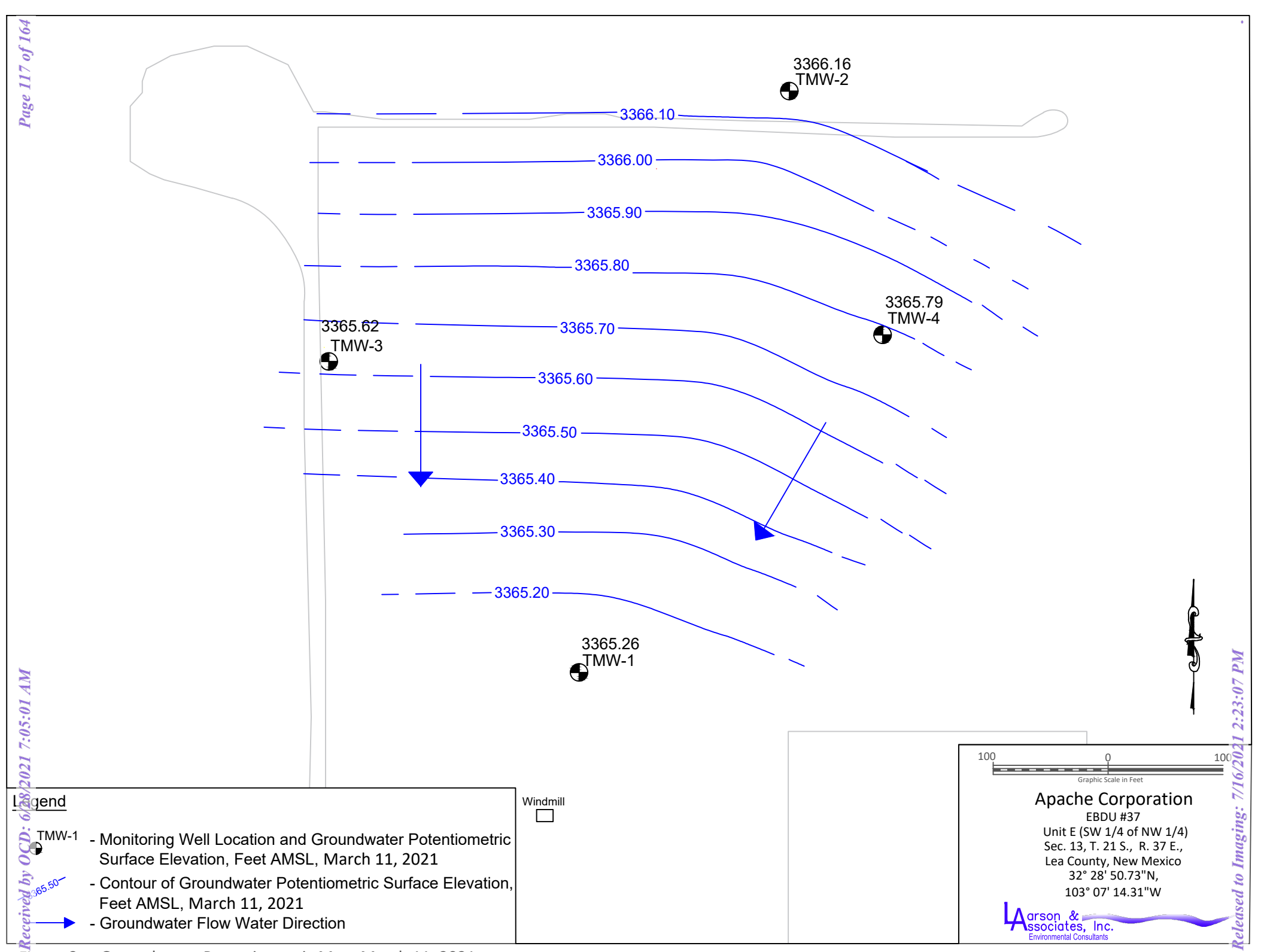


Figure 1 - Topographic Map

Figure 2 - Aerial Map



Legend

TMW-1 - Monitoring Well Location and Groundwater Potentiometric Surface Elevation, Feet AMSL, March 11, 2021

3365.50 - Contour of Groundwater Potentiometric Surface Elevation, Feet AMSL, March 11, 2021

- Groundwater Flow Water Direction

Figure 3a - Groundwater Potentiometric Map, March 11, 2021

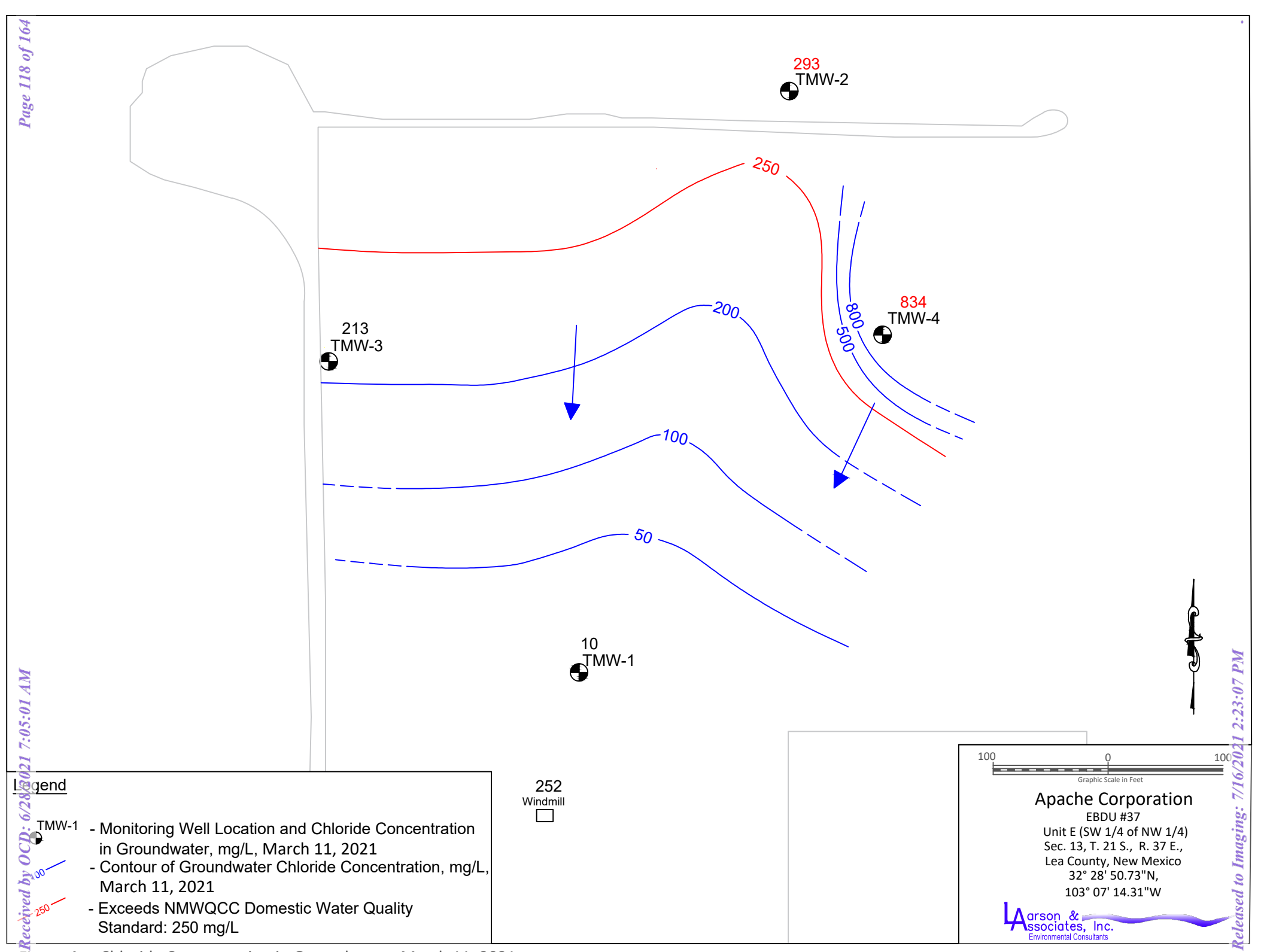
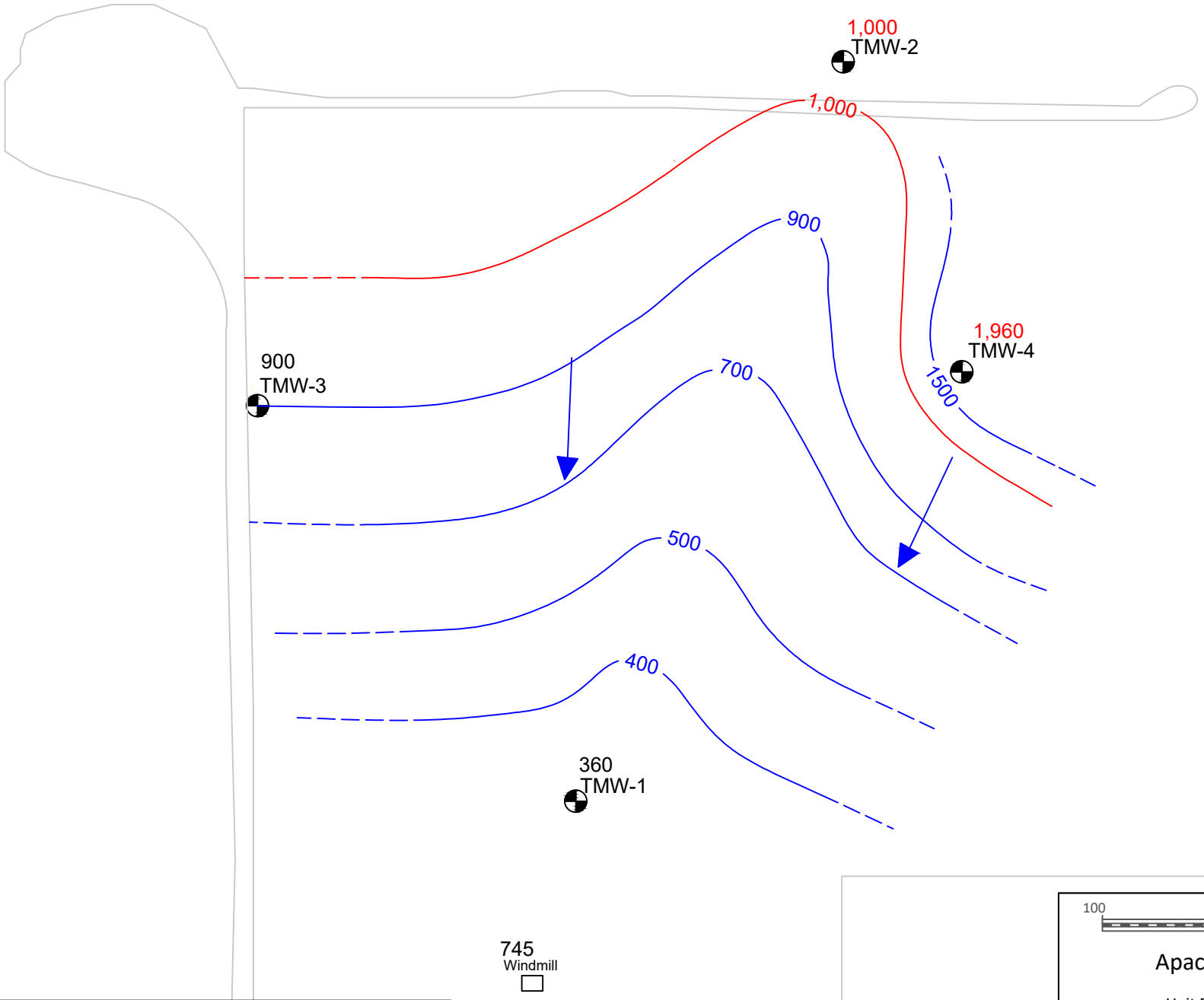


Figure 4a - Chloride Concentration in Groundwater, March 11, 2021



Legend

TMW-1 - Monitoring Well Location and TDS Concentration in Groundwater, mg/L, March 11, 2021

400 — - Contour of TDS Concentration in Groundwater, mg/L

1000 — - NMWQCC Domestic Water Quality Standard: 1,000 mg/L

100 0 100

Graphic Scale in Feet

Apache Corporation
EBDU #37
Unit E (SW 1/4 of NW 1/4)
Sec. 13, T. 21 S., R. 37 E.,
Lea County, New Mexico
32° 28' 50.73"N,
103° 07' 14.31"W

Larson & Associates, Inc.
Environmental Consultants

Figure 5a - TDS Concentration in Groundwater, March 11, 2021

Appendix A

Initial C-141

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	NDHR1922141227
District RP	1RP-5636
Facility ID	
Application ID	pDHR1922140928

Release Notification

Responsible Party

Responsible Party: Apache Corporation	OGRID 873
Contact Name: Bruce Baker	Contact Telephone: (432) 631-6982
Contact email: Larry.Baker@apachecorp.com	Incident # *(assigned by OCD)*
Contact Mailing Address: 2350 W. Marland Blvd, Hobbs, NM 88240	

Location of Release Source

Latitude: W 32.4807053 Longitude: N -103.123085

(NAD 83 in decimal degrees to 5 decimal places)

Site Name: EBDU #37 WIW	Site Type: Water Injection Well
Date Release Discovered: July 14, 2019	API # *3002506556*

Unit Letter	Section	Township	Range	County
E	12	21S	37E	LEA

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☒ Private (*Name: William Stephens*)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☒ Crude Oil	Volume Released (Unknown bbls)	Volume Recovered (Unknown bbls)
☒ Produced Water	Volume Released (Unknown bbls)	Volume Recovered (Unknown bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☒ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

Isolation valve failure due to internal corrosion.

State of New Mexico
Oil Conservation Division

Incident ID	NDHR1922141227
District RP	1RP-5636
Facility ID	
Application ID	pDHR1922140928

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☒ No	If YES, for what reason(s) does the responsible party consider this a major release?

If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?
Via email given to NM OCD by Bruce Baker, Senior Environmental Technician, Apache Corporation

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☒ The source of the release has been stopped.
☒ The impacted area has been secured to protect human health and the environment.
☒ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☒ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Jeff Broom Title: Environmental Technician

Signature: _____ Date: 07/24/2019

Email: Jeffrey.Broom@apachecorp.com Telephone: (432) 664-4677

OCD Only

Received by: Dylan Rose-Coss Date: 08/09/2019

Appendix B

OCD Communications

From: Billings, Bradford, EMNRD
To: Mark Larson
Cc: Baker, Larry; Rachel Owen
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan
Date: Monday, December 23, 2019 3:21:06 PM

12/23/2019

Apache Corp. – Larry Baker
Larson Environmental

RE: 1RP-5636/EBDU #37, the following:

The attached/stringed email as an addendum to offered Work Plan is approved, including the location of proposed monitor wells, as was discussed recently on the telephone.

Please keep a copy of this communication for your records, as NO paper copy will follow. It may take some days for this to be uploaded to The Oil Conservation Division (OCD) data base,

ODE appreciates your efforts.

Sincerely,

Bradford Billings
EMNRD/OCD
Santa Fe, NM

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations

---

From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, December 23, 2019 12:58 PM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Rachel Owen <rowen@laenvironmental.com>; Mark Larson <Mark@laenvironmental.com>
Subject: [EXT] Re: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Dear Bradford,
This email will confirm our phone conversation on December 20, 2019 for the EBDU #37 produced water release:

- Apache will install a boring in the bottom of the excavation to delineate the vertical extent of chloride in soil. Soil samples will be collected beginning at the bottom of the excavation and every five (5) feet thereafter until chloride decreases below 600 mg/Kg or groundwater is encountered;
- Apache will install two (2) additional monitoring wells at locations shown on the attached drawing. The monitoring wells will be constructed similar to monitoring well TMW-1 and TMW-2 with about 20 feet of screen placed above and below the groundwater level observed during drilling. Groundwater is expected to occur around 50 feet bgs therefore the borings will be advanced to around 70 feet bgs;
- Survey wells for top of elevation (top of casing and ground) for groundwater potentiometric surface elevation, flow direction and gradient;
- Apache will close the excavation at Area 1 according to the remediation plan dated October 29, 2019;
- Apache will close the excavation at Area 2, based on the laboratory results of samples from the boring to be placed in the bottom of the excavation, by filling the excavation to approximately 5 feet bgs with clean caliche, installing a 20 mill thickness polyethylene liner at approximately 5 feet bgs and backfilling to surface with clean topsoil;
- Seed Area 1 and Area 2 following remediation according to landowner requirements;
- Perform quarterly groundwater monitoring (5 wells) and reporting.

Your approval is this addendum remediation plan is requested. Please contact Bruce Baker with Apache or me if you have questions.

Mark J. Larson, P.G.
President/Sr. Hydrogeologist
507 N. Marienfeld St., Suite 202
Midland, Texas 79701
Office – 432-687-0901
Cell – 432- 556-8656
Fax – 432-687-0456
mark@laenvironmental.com

Larson & Associates, Inc.
Environmental Consultants

"Serving the Permian Basin Since 2000"

From: Billings, Bradford, EMNRD
To: Mark Larson
Cc: Baker, Larry; Robert Nelson
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan
Date: Tuesday, September 1, 2020 4:10:21 PM

09/01/2020

Mark,

As stated below was agreed in our phone conversation.

Bradford Billings

EMNRD/OCD

OCD approval does not relieve the operator of liability should their operations fail to adequately investigate and remediate contamination that may pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the operator of responsibility for compliance with any other federal, state, local laws and/or regulations

From: Mark Larson <Mark@laenvironmental.com>
Sent: Tuesday, September 1, 2020 10:48 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: [EXT] FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
This email confirms our call today, September 1, 2020, for approval to complete backfilling the excavation in the swale at EBDU #37. As discussed the excavation is currently backfilled with caliche to approximately 5 feet below ground surface (bgs). NMOCD approved filling the remainder of the excavation to three (3) feet with clean caliche and to ground surface with topsoil. Since Apache is finishing backfilling the north excavation with topsoil it will fill the excavation in the swale with topsoil from 5 feet to ground surface. Notification will be submitted o NMOCD at least 7 days excluding weekends prior to installing monitoring wells. Please let me know if this is not consistent with our discussion. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.Baker@apachecorp.com or me if you have questions.
Thank you,
Mark J. Larson, P.G.
President/Sr. Hydrogeologist
507 N. Marienfeld St., Suite 202
Midland, Texas 79701
Office – 432-687-0901
Cell – 432- 556-8656

Fax – 432-687-0456
mark@laenvironmental.com

From: Mark Larson
Sent: Thursday, August 13, 2020 8:26 AM
To: 'Bradford.Billings@state.nm.us' <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
Soil sampling at EBDU #37 was completed on August 11, 202. The laboratory reported chloride above the OCD closure criteria of 600 milligrams per kilogram (mg/Kg) in two (2) samples: BH-3, 10 feet (774 mg/Kg) and 12 feet (666 mg/Kg). Chloride was 419 mg/Kg in the sample from 14 feet. Apache would like to forgo installing the 20 mil thickness polyethylene liner in the bottom of the large excavation and fill the remainder of the Area 2 excavation with caliche to approximately 3 feet bgs and with top soil from 3 feet to ground surface. The excavation north of the large excavation will be completed per the approved remediation plan. Please see the attached drawing (Figure 2) for the boring locations. Table 4 presents the confirmation composite sample locations. Drilling and installation for two (2) monitoring wells is scheduled for Monday, August 18th.

Your approval is this remediation plan modification is requested. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.Baker@apachecorp.com or me if you have questions.

Mark J. Larson, P.G.
President/Sr. Hydrogeologist
507 N. Marienfeld St., Suite 202
Midland, Texas 79701
Office – 432-687-0901
Cell – 432- 556-8656
Fax – 432-687-0456
mark@laenvironmental.com

"Serving the Permian Basin Since 2000"

From: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Sent: Monday, August 10, 2020 10:51 AM
To: Mark Larson <Mark@laenvironmental.com>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

08/10/2020

Hello M. Baker (Apache) and Mr. Larson (LAI),

As OCD has been informed you are looking to proceed on the site tomorrow, the following:

OCD approves the modifications as indicated in attached email form LAI. If the circumstances occur as is possible, there would be no need for the liner, and OCD agrees. OCD appreciates the desire to generate accurate data and is please for your efforts along those lines. If field data indicates a modification please attempt to contact me on phone or email.

Thank you and please be safe and careful.

Sincerely,

Bradford Billings
EMNRD/OCD

From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, August 10, 2020 8:49 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: [EXT] FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
I am following up on the email below to see if you have had a moment to review.
Thank you,
Mark

From: Mark Larson
Sent: Friday, August 7, 2020 11:45 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
Apache Corporation has completed backfilling the deep excavation (Area 2) at EBUD #37 (1RP-5636) with clean caliche to approximately five (5) feet below ground surface (bgs) to allow access for a Geoprobe Model 7822DT to delineate the vertical extent of chloride in soil below the excavation at approximately 12 feet bgs. Personnel from Larson & Associates, Inc. (LAI) collected soil samples at the proposed boring location (BH-1) near the center of the excavation at 10, 12, 14, 16, 18 and 20 feet bgs, on August 3, 2020. The laboratory reported chloride at 11.6 mg/Kg (10 feet), 13.3 mg/Kg (12 feet), 13.4 mg/Kg (14 feet), 22.9 mg/Kg (16 feet), 34.4 mg/Kg (18 feet) and 24.7 mg/Kg at 20 feet bgs. Previous bottom samples from B15 collected on August 8, 2019, from 13, 15, 17, 19, 21 and 22 feet bgs, reported chloride at 720 mg/Kg, 1,840 mg/Kg, 1,950 mg/Kg, 3,800 mg/Kg, 544 mg/Kg, and 3,440 mg/Kg, respectively, and suggested possible sample cross contamination. Benzene, BTEX and TPH were the analytical method reporting limits. LAI personnel collected composite sidewall samples from the excavation to approximately 5 feet that were analyzed for benzene, BTEX and TPH. The final concentrations are below the OCD cleanup levels in Table 1 (19.15.29 NMAC).

Apache requests approval from OCD to collect additional delineation soil samples with the Geoprobe from four (4) locations (north, south, east and west) from location BH-1 at the same depths (10, 12,14,16,18 and 20 feet) and analyze the samples for chloride. Apache would like to forgo installing the 20 mil thickness polyethylene liner in the bottom of the large excavation If chloride concentrations are below the OCD remediation limit (600 mg/Kg). Apache will fill the remainder of the Area 2 excavation with caliche to approximately 3 feet bgs and with top soil from 3 feet to ground surface. The excavation north of the large excavation will be completed per the approved remediation plan. Please see the attached drawing (Figure 2) for the proposed borings BH-2 through BH-5. Figure 2a presents the composite soil sample locations. Table 4 presents the confirmation composite sample locations.

Your approval is this remediation plan modification is requested. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.Baker@apachecorp.com or me if you have questions.

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mark@laenvironmental.com

Larson & Associates, Inc.
Environmental Consultants

"Serving the Permian Basin Since 2000"

From: Mark Larson <Mark@laenvironmental.com>

Sent: Monday, December 23, 2019 1:58 PM
To: Bradford.Billings@state.nm.us
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Rachel Owen <rowen@laenvironmental.com>; Mark Larson <Mark@laenvironmental.com>
Subject: Re: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Dear Bradford,
This email will confirm our phone conversation on December 20, 2019 for the EBDU #37 produced water release:

- Apache will install a boring in the bottom of the excavation to delineate the vertical extent of chloride in soil. Soil samples will be collected beginning at the bottom of the excavation and every five (5) feet thereafter until chloride decreases below 600 mg/Kg or groundwater is encountered;
- Apache will install two (2) additional monitoring wells at locations shown on the attached drawing. The monitoring wells will be constructed similar to monitoring well TMW-1 and TMW-2 with about 20 feet of screen placed above and below the groundwater level observed during drilling. Groundwater is expected to occur around 50 feet bgs therefore the borings will be advanced to around 70 feet bgs;
- Survey wells for top of elevation (top of casing and ground) for groundwater potentiometric surface elevation, flow direction and gradient;
- Apache will close the excavation at Area 1 according to the remediation plan dated October 29, 2019;
- Apache will close the excavation at Area 2, based on the laboratory results of samples from the boring to be placed in the bottom of the excavation, by filling the excavation to approximately 5 feet bgs with clean caliche, installing a 20 mill thickness polyethylene liner at approximately 5 feet bgs and backfilling to surface with clean topsoil;
- Seed Area 1 and Area 2 following remediation according to landowner requirements;
- Perform quarterly groundwater monitoring (5 wells) and reporting.

Your approval is this addendum remediation plan is requested. Please contact Bruce Baker with Apache or me if you have questions.

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Midland, Texas 79701
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Fax – 432-687-0456
mark@laenvironmental.com

"Serving the Permian Basin Since 2000"

From: Billings, Bradford, EMNRD
To: Mark Larson
Cc: Baker, Larry; Robert Nelson
Subject: RE: 1RP-5636 - EBDU #37 Addendum to Remediation Plan
Date: Monday, August 10, 2020 11:03:12 AM

08/10/2020

Hello M. Baker (Apache) and Mr. Larson (LAI),

As OCD has been informed you are looking to proceed on the site tomorrow, the following:

OCD approves the modifications as indicated in attached email form LAI. If the circumstances occur as is possible, there would be no need for the liner, and OCD agrees. OCD appreciates the desire to generate accurate data and is please for your efforts along those lines. If field data indicates a modification please attempt to contact me on phone or email.

Thank you and please be safe and careful.

Sincerely,

Bradford Billings
EMNRD/OCD

From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, August 10, 2020 8:49 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: [EXT] FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

Hello Bradford,
I am following up on the email below to see if you have had a moment to review.
Thank you,
Mark

From: Mark Larson
Sent: Friday, August 7, 2020 11:45 AM
To: Billings, Bradford, EMNRD <Bradford.Billings@state.nm.us>
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Robert Nelson <rnelson@laenvironmental.com>
Subject: FW: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

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Your approval is this remediation plan modification is requested. Please contact Bruce Baker with Apache at (432) 631-6982 or email Larry.Baker@apachecorp.com or me if you have questions.

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Environmental Consultants

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From: Mark Larson <Mark@laenvironmental.com>
Sent: Monday, December 23, 2019 1:58 PM

To: Bradford.Billings@state.nm.us
Cc: Baker, Larry <Larry.Baker@apachecorp.com>; Rachel Owen <rowen@laenvironmental.com>; Mark Larson <Mark@laenvironmental.com>
Subject: Re: 1RP-5636 - EBDU #37 Addendum to Remediation Plan

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Your approval is this addendum remediation plan is requested. Please contact Bruce Baker with Apache or me if you have questions.

Mark J. Larson, P.G.
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Midland, Texas 79701
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Environmental Consultants

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Appendix C

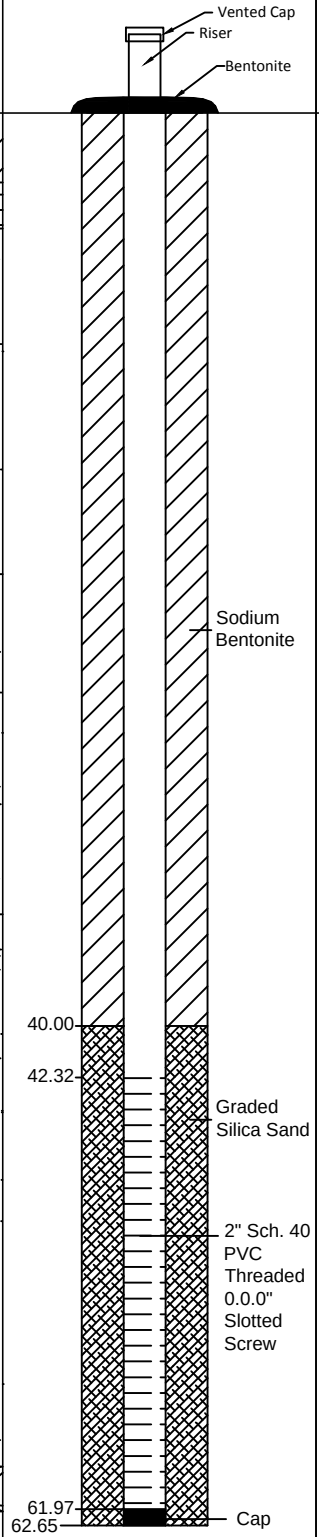
Boring Logs

BORING RECORD

Start: 11:40
Finish: 12:58

Surface Elevation:
TOC Elecation:

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG
	0	Silty Clay, 7.5YR, 5/1, Gray, Very Fine Grained Quartz Sand, Dry	CL	
	5	Caliche, 7.5YR, 7/1 to 7/2, Pinkish Gray, Sandy, Fine to Very Fine Grained Quartz Sand, Dry	Caliche	
	10	Silty Sand, 10YR, 6/4, Light Yellowish ..., Very Fine to Fine Grained Quartz Sand, Poorly Sorted, Subrounded, Loose	SM	
	15			
	20	7.5YR, 6/6, Reddish Yellow Below 10', Poorly Sorted, ... Round		
	25	10YR, 7/4, Very Pale Brown Below 15'		
	30	Sand, 5YR, 5/6 to 6/6, Yellowish Red to Reddish Yellow, Very Fine Grained Quartz Sand, Poorly Sorted, Round, Moist, Very Moist	SW	
	35	Below 35'		
	40	Sandstone, 5YR, 6/6, Reddish Yellow, Very Fine Grained Quartz Sand,Poorly Sorted, Moderately Well Cemented to Well Cemented	Sand Stone	
46.72	45			
	50			
	55			
	60	Gravelly Sand, 7.5YR, 6/6, Reddish Yellow, Fine to Medium Grained Quartz Sand, Round, Cobbles to 40mm	SP	
		TD: 62'		



REMARKS	NUMBER	RECOVERY	DEPTH
BACKGROUND PID READING SOIL : _____ PPM SOIL : _____ PPM			1, 5, 10, 15, 20, 25, 30, 35, 40, 45, 60

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 Corp./ 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : M. Larson
DRILLING CONTRACTOR :
DRILLING METHOD : SR/WR

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 9-19-2019

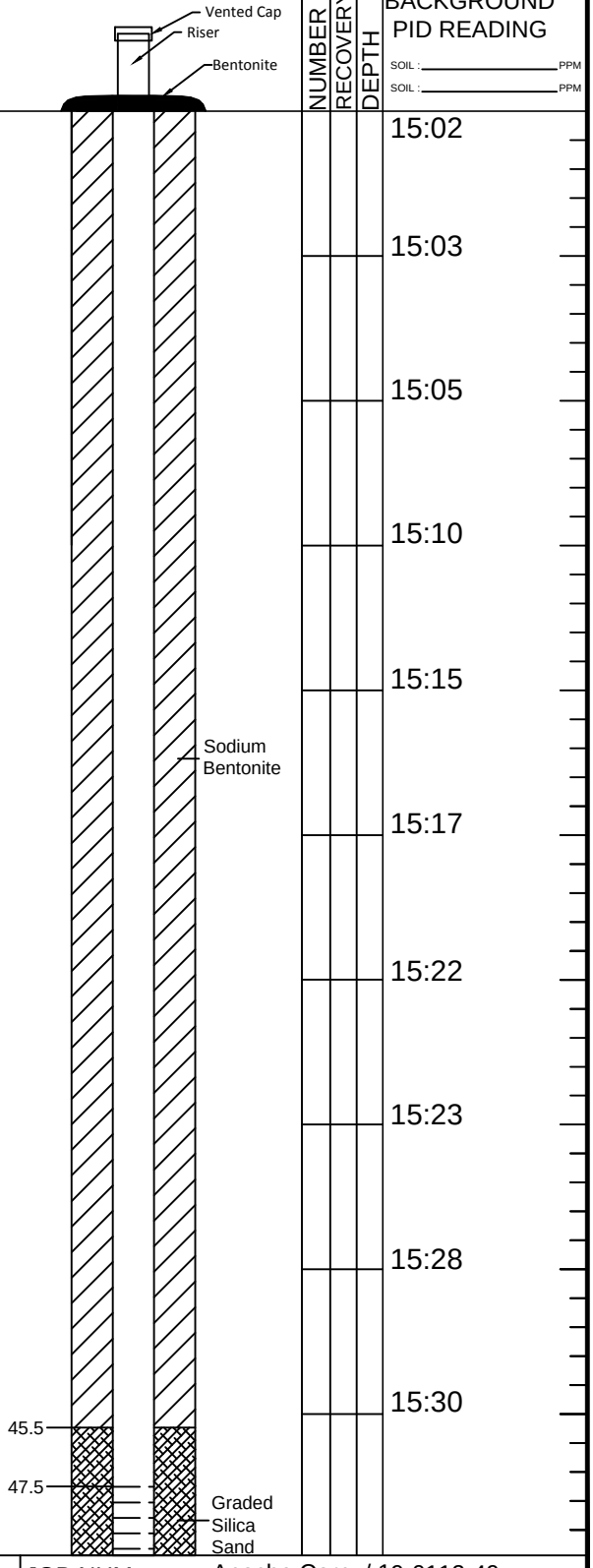
BORING NUMBER : TMW-1

BORING RECORD

Start: 15:02
Finish: 15:55

Surface Elevation: 3,563.50'
TOC Elecation: 3,566.23'

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	REMARKS BACKGROUND PID READING
	0	Silty Clay, 10YR, 5/6, Ash Brown, Dry	CL		15:02
	5	Caliche, 7.5YR, 8/2, Pinkish White, Sandy to Moderate Very Fine Grained Quartz Sand	Caliche		15:03
	10				15:05
	15	Silty Sand, 7.5YR, 7/2, Pinkish Gray, Very Fine Grained Quartz Sand, Poorly Sorted, Dry	SM		15:10
	20				15:15
	25	Sand, 5YR, 6/0, Reddish Yellow, Very Fine Grained Quartz Sand, Poorly Sorted, Dry	SW		15:17
	30				15:22
	35				15:23
	40				15:28
	45	Sand, 5YR, 6/6, Reddish Yellow, Moderate Well Cemented, Poorly Sorted, Dry	SW		15:30
		Continue			



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 : 9-20-2019
BORING NUMBER : TMW-2

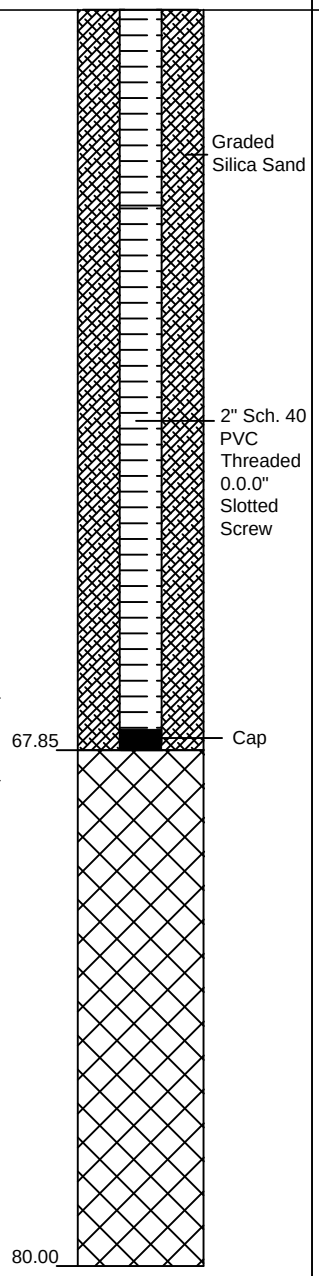
JOB NUMBER : Apache Corp. / 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : M. Larson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

BORING RECORD

Start: 15:02
Finish: 15:55

Surface Elevation: 3,563.50'
TOC Elecation: 3,566.23'

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG	*Continue*	NUMBER	RECOVERY	DEPTH	REMARKS BACKGROUND PID READING SOIL : PPM SOIL : PPM
	50	*Continue*							
	55	Silty and Clayey Below 50', Moist at 55'	SM-SC						
	60								
	65								
	70								
	75	Gravel, 7.5YR, 4/3, Light Brown, Poorly Sorted, Round, Red Bed	GW						
	80	TD: 79'							



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 : 9-20-2019
BORING NUMBER : TMW-2

JOB NUMBER : Apache Corp. / 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : M. Larson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

BORING RECORD

Start: 09:35 MST
Finish: 10:30 MST

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG
	0	Sand, 7.5YR 4/4, Brown, Fine to Very Fine Quartz Sand,Quartz and Feldspar Moderate to Well Sorted, Sub Rounded to Well Rounded	SM	
	5			
	10	Caliche, 7.5YR 8/2, Pinkish White, Sandy, Fine to Very Fine Grains, Well Sorted, Well Rounded	Caliche	
	15			
	20	Sand, 10YR 8/2, Very Pale Brown, Quartz Rich Sand, Well Rounded to Very Well Rounded, Very Well Sorted, Fine to Very Fine Grained Quartz Sand	SM	
	25			
	30	7.5YR 5/6, Strong Brown, Oxidized, Quartz Rich, Well Rounded to Very Well Rounded, Very Well Sorted, Fine to Very Fine Grained Quartz Sand with Increase in Depth Lithology Remains the Same		
	35			
	40	@37' becomes Silty to Very Fine Grained Quartz Sand to 65'		
	45			
	50			
	55		SM	
	60			
	65			
	70	Gravelly Sand, 7.5YR, Strong Brown, Fine to Very Fine Coarse Sand, Quartz and Feldspar, Oxidized, Sub Angular to Sub Rounded, Gravel(5-15mm), Poorly Sorted	SP	
	75			
		TD: 68.41'		

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

SAMPLE NUMBER	PID READING	RECOVERY	DEPTH
1			1
2			5
3			10
4			15
5			20
6			25
7			30
8			35
9			40
10			45
11			50
12			55
13			60
14			65
15			68

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)
L LABORATORY TEST LOCATION
\+ PENETROMETER (TONS/ SQ. FT)
NR NO RECOVERY

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 09-29-2020
BORING NUMBER : TMW-3

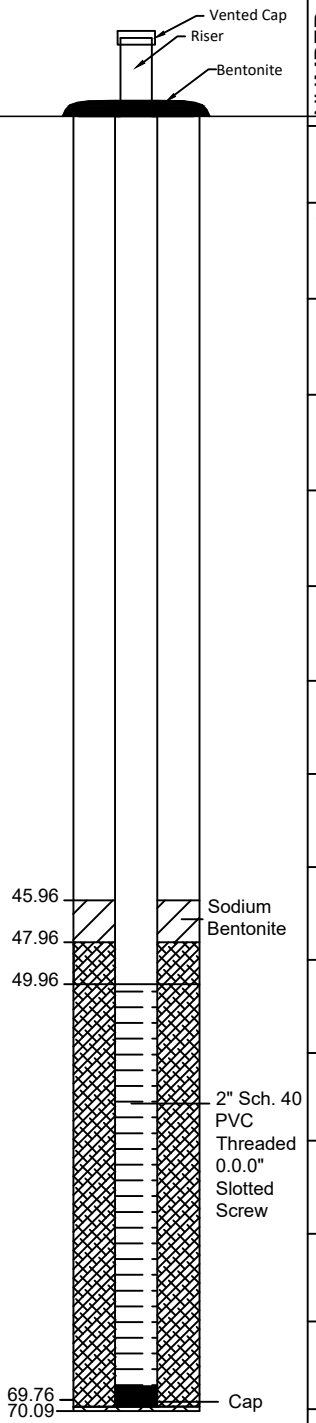
JOB NUMBER : Apache/ 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

BORING RECORD

Start: 12:45
Finish: 13:40

GEOLOGIC UNIT	DEPTH	DESCRIPTION LITHOLOGIC	DESCRIPTION USCS	GRAPHIC LOG
	0	Caliche, 7.5YR 8/2, Pinkish White, Medium to Very Fine, Poorly Sorted, Sub Angular to Sub Rounded	Caliche	
	15	Sand, 10YR 8/2, Very Pale Brown, Quartz Rich Sand, Well Rounded to Very Well Rounded, Very Well Sorted, Fine to Very Fine Quartz Sand	SM	
	25	7.5YR 5/6, Strong Brown, Oxidized, Quartz Rich Sand, Sub Angular to Sub Rounded, Poorly Sorted, Coarse to Fine Grained Quartz Sand with Increase in Depth @34' Lithology Remained Constant and Grain Size Decreased to Fine to Very Fine Quartz Sand, Well Sorted, Rounded to Well Rounded		
	55	Sand, 7.5YR, Strong Brown, With Gravel, Fine to Very Coarse Quartz Sand, Quartz and Feldspar, Oxidized, Sub Angular to Sub Rounded, Gravel (5-15mm), Poorly Sorted	SM	
	70	TD: 70.09'		
	75			

PID READING / SAMPLE / REMARKS



NUMBER	RECOVERY	DEPTH
1		1
2		5
3		10
4		15
5		20
6		25
7		30
8		35
9		40
10		45
11		50
12		55
13		60
14		65
15		70

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/ 19-0112-49
HOLE DIAMETER : 5"
LOCATION : EBDU #37
LAI GEOLOGIST : T. Jackson
DRILLING CONTRACTOR : SDC
DRILLING METHOD : Air Rotary

Larson & Associates, Inc. Environmental Consultants

DRILL DATE : 09-29-2020

BORING NUMBER : TMW-4

Appendix D

Laboratory Report

eurofins | Environment Testing America

ANALYTICAL REPORT

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

Laboratory Job ID: 880-387-1
Client Project/Site: Apache-EBDU #37

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

Attn: Mr. Mark J Larson

Holly Taylor

Authorized for release by:
3/26/2021 9:50:23 AM

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

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Laboratory Job ID: 880-387-1

Table of Contents

Definitions/Glossary

Client: Larson & Associates, Inc. Job ID: 880-387-1
Project/Site: Apache-EBDU #37

Qualifiers

GC VOA

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
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.

Subcontract

Qualifier	Qualifier Description
K	Sample analyzed outside of recommended hold time.
U	Analyte was 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: Apache-EBDU #37

Job ID: 880-387-1

Job ID: 880-387-1

Laboratory: Eurofins Xenco, Midland

Narrative

Job Narrative
880-387-1

Comments
No additional comments.

Receipt
The samples were received on 3/15/2021 9:18 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 was 3.5º C.

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

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

Subcontract non-Sister
See attached subcontract report.

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

Subcontract Work
Method TDS: This method was subcontracted to Eurofins Stafford. The subcontract laboratory certification is different from that of the facility issuing the final report.

Detection Summary

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Client Sample ID: TWM-1 Lab Sample ID: 880-387-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	10.9		0.500		mg/L	1		300.0	Total/NA
Total Dissolved Solids	360	K	5.00		mg/L	1		TDS	Total/NA

Client Sample ID: TWM-3 Lab Sample ID: 880-387-2

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	213		5.00		mg/L	10		300.0	Total/NA
Total Dissolved Solids	900	K	5.00		mg/L	1		TDS	Total/NA

Client Sample ID: TWM-2 Lab Sample ID: 880-387-3

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	293		5.00		mg/L	10		300.0	Total/NA
Total Dissolved Solids	1000	K	5.00		mg/L	1		TDS	Total/NA

Client Sample ID: TWM-4 Lab Sample ID: 880-387-4

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	834		10.0		mg/L	20		300.0	Total/NA
Total Dissolved Solids	1960	K	5.00		mg/L	1		TDS	Total/NA

Client Sample ID: Windmill Lab Sample ID: 880-387-5

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	252		2.50		mg/L	5		300.0	Total/NA
Total Dissolved Solids	745	K	5.00		mg/L	1		TDS	Total/NA

Client Sample ID: Dup-1 Lab Sample ID: 880-387-6

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Chloride	259		2.50		mg/L	5		300.0	Total/NA
Total Dissolved Solids	798	K	5.00		mg/L	1		TDS	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Xenco, Midland

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Client Sample ID: TWM-1

Date Collected: 03/11/21 08:53
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-1

Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00		ug/L			03/24/21 02:09	1
Ethylbenzene	<2.00	U	2.00		ug/L			03/24/21 02:09	1
Toluene	<2.00	U	2.00		ug/L			03/24/21 02:09	1
Total BTEX	<2.00	U	2.00		ug/L			03/24/21 02:09	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/24/21 02:09	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/24/21 02:09	1
o-Xylene	<2.00	U	2.00		ug/L			03/24/21 02:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*70 - 130*		*03/24/21 02:09*	*1*
1,4-Difluorobenzene (Surr)	*102*		*70 - 130*		*03/24/21 02:09*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**10.9**		0.500		mg/L			03/17/21 23:08	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**360**	**K**	5.00		mg/L		03/21/21 12:30	03/21/21 12:30	1

Client Sample ID: TWM-3

Date Collected: 03/11/21 09:12
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-2

Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00		ug/L			03/20/21 10:50	1
Ethylbenzene	<2.00	U	2.00		ug/L			03/20/21 10:50	1
Toluene	<2.00	U	2.00		ug/L			03/20/21 10:50	1
Total BTEX	<2.00	U	2.00		ug/L			03/20/21 10:50	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/20/21 10:50	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/20/21 10:50	1
o-Xylene	<2.00	U	2.00		ug/L			03/20/21 10:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*03/20/21 10:50*	*1*
1,4-Difluorobenzene (Surr)	*99*		*70 - 130*		*03/20/21 10:50*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**213**		5.00		mg/L			03/17/21 23:17	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**900**	**K**	5.00		mg/L		03/21/21 12:30	03/21/21 12:30	1

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Client Sample ID: TWM-2

Date Collected: 03/11/21 09:36
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-3
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00		ug/L			03/20/21 11:11	1
Ethylbenzene	<2.00	U	2.00		ug/L			03/20/21 11:11	1
Toluene	<2.00	U	2.00		ug/L			03/20/21 11:11	1
Total BTEX	<2.00	U	2.00		ug/L			03/20/21 11:11	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/20/21 11:11	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/20/21 11:11	1
o-Xylene	<2.00	U	2.00		ug/L			03/20/21 11:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*70 - 130*		*03/20/21 11:11*	*1*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*		*03/20/21 11:11*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**293**		5.00		mg/L			03/17/21 23:26	10

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1000**	**K**	5.00		mg/L		03/21/21 12:30	03/21/21 12:30	1

Client Sample ID: TWM-4

Date Collected: 03/11/21 10:05
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-4
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00		ug/L			03/20/21 11:31	1
Ethylbenzene	<2.00	U	2.00		ug/L			03/20/21 11:31	1
Toluene	<2.00	U	2.00		ug/L			03/20/21 11:31	1
Total BTEX	<2.00	U	2.00		ug/L			03/20/21 11:31	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/20/21 11:31	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/20/21 11:31	1
o-Xylene	<2.00	U	2.00		ug/L			03/20/21 11:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*70 - 130*		*03/20/21 11:31*	*1*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*		*03/20/21 11:31*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**834**		10.0		mg/L			03/17/21 23:35	20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1960**	**K**	5.00		mg/L		03/21/21 12:30	03/21/21 12:30	1

Client Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Client Sample ID: Windmill

Lab Sample ID: 880-387-5
Matrix: Water
Date Collected: 03/12/21 13:26
Date Received: 03/15/21 09:18

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00		ug/L			03/20/21 11:52	1
Ethylbenzene	<2.00	U	2.00		ug/L			03/20/21 11:52	1
Toluene	<2.00	U	2.00		ug/L			03/20/21 11:52	1
Total BTEX	<2.00	U	2.00		ug/L			03/20/21 11:52	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/20/21 11:52	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/20/21 11:52	1
o-Xylene	<2.00	U	2.00		ug/L			03/20/21 11:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*108*		*70 - 130*		*03/20/21 11:52*	*1*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*		*03/20/21 11:52*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**252**		2.50		mg/L			03/18/21 00:02	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**745**	**K**	5.00		mg/L		03/21/21 12:30	03/21/21 12:30	1

Client Sample ID: Dup-1

Lab Sample ID: 880-387-6
Matrix: Water
Date Collected: 03/12/21 00:00
Date Received: 03/15/21 09:18

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00		ug/L			03/24/21 02:30	1
Ethylbenzene	<2.00	U	2.00		ug/L			03/24/21 02:30	1
Toluene	<2.00	U	2.00		ug/L			03/24/21 02:30	1
Total BTEX	<2.00	U	2.00		ug/L			03/24/21 02:30	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/24/21 02:30	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/24/21 02:30	1
o-Xylene	<2.00	U	2.00		ug/L			03/24/21 02:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*70 - 130*		*03/24/21 02:30*	*1*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*		*03/24/21 02:30*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**259**		2.50		mg/L			03/18/21 00:11	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**798**	**K**	5.00		mg/L		03/21/21 12:30	03/21/21 12:30	1

Surrogate Summary

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

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)	DFBZ1 (70-130)
820-139-B-4 MS	Matrix Spike	93	99
820-139-B-4 MSD	Matrix Spike Duplicate	97	101
880-387-1	TWM-1	91	102
880-387-2	TWM-3	102	99
880-387-3	TWM-2	108	101
880-387-4	TWM-4	107	101
880-387-5	Windmill	108	101
880-387-6	Dup-1	95	101
890-344-A-1 MS	Matrix Spike	100	98
890-344-A-1 MSD	Matrix Spike Duplicate	103	95
LCS 880-592/3	Lab Control Sample	100	100
LCS 880-750/33	Lab Control Sample	94	94
LCSD 880-592/4	Lab Control Sample Dup	100	100
LCSD 880-750/34	Lab Control Sample Dup	97	100
MB 880-592/8	Method Blank	102	97
MB 880-598/5-A	Method Blank	111	95
MB 880-750/39	Method Blank	115	96

Surrogate Legend

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

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 880-592/8
Matrix: Water
Analysis Batch: 592

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00		ug/L			03/19/21 10:29	1
Ethylbenzene	<2.00	U	2.00		ug/L			03/19/21 10:29	1
Toluene	<2.00	U	2.00		ug/L			03/19/21 10:29	1
Total BTEX	<2.00	U	2.00		ug/L			03/19/21 10:29	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/19/21 10:29	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/19/21 10:29	1
o-Xylene	<2.00	U	2.00		ug/L			03/19/21 10:29	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*70 - 130*		*03/19/21 10:29*	*1*
1,4-Difluorobenzene (Surr)	*97*		*70 - 130*		*03/19/21 10:29*	*1*

Lab Sample ID: LCS 880-592/3
Matrix: Water
Analysis Batch: 592

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			100	104.1		ug/L		104	70 - 130		
Ethylbenzene			100	114.1		ug/L		114	70 - 130		
Toluene			100	110.0		ug/L		110	70 - 130		
m-Xylene & p-Xylene			200	233.0		ug/L		117	70 - 130		
o-Xylene			100	112.0		ug/L		112	70 - 130		

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

Lab Sample ID: LCSD 880-592/4
Matrix: Water
Analysis Batch: 592

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			100	110.6		ug/L		111	70 - 130	6	20
Ethylbenzene			100	119.9		ug/L		120	70 - 130	5	20
Toluene			100	115.8		ug/L		116	70 - 130	5	20
m-Xylene & p-Xylene			200	244.2		ug/L		122	70 - 130	5	20
o-Xylene			100	117.1		ug/L		117	70 - 130	4	20

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

Lab Sample ID: 890-344-A-1 MS
Matrix: Water
Analysis Batch: 592

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	<2.00	U F1	100	114.4		ug/L		114	70 - 130		

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

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

Lab Sample ID: 890-344-A-1 MS
Matrix: Water
Analysis Batch: 592

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
Ethylbenzene	<2.00	U F1	100	121.0		ug/L		121	70 - 130
Toluene	<2.00	U F1	100	118.2		ug/L		118	70 - 130
m-Xylene & p-Xylene	<4.00	U F1	200	247.1		ug/L		124	70 - 130
o-Xylene	<2.00	U F1	100	119.3		ug/L		119	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*70 - 130*
1,4-Difluorobenzene (Surr)	*98*		*70 - 130*

Lab Sample ID: 890-344-A-1 MSD
Matrix: Water
Analysis Batch: 592

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	<2.00	U F1	100	<2.00	U F1	ug/L		0	70 - 130	NC	25
Ethylbenzene	<2.00	U F1	100	<2.00	U F1	ug/L		0	70 - 130	NC	25
Toluene	<2.00	U F1	100	<2.00	U F1	ug/L		0	70 - 130	NC	25
m-Xylene & p-Xylene	<4.00	U F1	200	<4.00	U F1	ug/L		0	70 - 130	NC	25
o-Xylene	<2.00	U F1	100	<2.00	U F1	ug/L		0	70 - 130	NC	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*103*		*70 - 130*
1,4-Difluorobenzene (Surr)	*95*		*70 - 130*

Lab Sample ID: MB 880-598/5-A
Matrix: Water
Analysis Batch: 750

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 598

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L		03/23/21 10:55	03/23/21 14:21	1
Ethylbenzene	<2.00	U	2.00	ug/L		03/23/21 10:55	03/23/21 14:21	1
Toluene	<2.00	U	2.00	ug/L		03/23/21 10:55	03/23/21 14:21	1
Total BTEX	<2.00	U	2.00	ug/L		03/23/21 10:55	03/23/21 14:21	1
Xylenes, Total	<4.00	U	4.00	ug/L		03/23/21 10:55	03/23/21 14:21	1
m-Xylene & p-Xylene	<4.00	U	4.00	ug/L		03/23/21 10:55	03/23/21 14:21	1
o-Xylene	<2.00	U	2.00	ug/L		03/23/21 10:55	03/23/21 14:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*111*		*70 - 130*	*03/23/21 10:55*	*03/23/21 14:21*	*1*
1,4-Difluorobenzene (Surr)	*95*		*70 - 130*	*03/23/21 10:55*	*03/23/21 14:21*	*1*

Lab Sample ID: MB 880-750/39
Matrix: Water
Analysis Batch: 750

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<2.00	U	2.00	ug/L			03/24/21 01:27	1
Ethylbenzene	<2.00	U	2.00	ug/L			03/24/21 01:27	1

Eurofins Xenco, Midland

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

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

Lab Sample ID: MB 880-750/39
Matrix: Water
Analysis Batch: 750

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Toluene	<2.00	U	2.00		ug/L			03/24/21 01:27	1
Total BTEX	<2.00	U	2.00		ug/L			03/24/21 01:27	1
Xylenes, Total	<4.00	U	4.00		ug/L			03/24/21 01:27	1
m-Xylene & p-Xylene	<4.00	U	4.00		ug/L			03/24/21 01:27	1
o-Xylene	<2.00	U	2.00		ug/L			03/24/21 01:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*115*		*70 - 130*		*03/24/21 01:27*	*1*
1,4-Difluorobenzene (Surr)	*96*		*70 - 130*		*03/24/21 01:27*	*1*

Lab Sample ID: LCS 880-750/33
Matrix: Water
Analysis Batch: 750

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			100	96.25		ug/L		96	70 - 130		
Ethylbenzene			100	93.87		ug/L		94	70 - 130		
Toluene			100	99.05		ug/L		99	70 - 130		
m-Xylene & p-Xylene			200	191.1		ug/L		96	70 - 130		
o-Xylene			100	93.23		ug/L		93	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*94*		*70 - 130*
1,4-Difluorobenzene (Surr)	*94*		*70 - 130*

Lab Sample ID: LCSD 880-750/34
Matrix: Water
Analysis Batch: 750

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			100	93.34		ug/L		93	70 - 130	3	20
Ethylbenzene			100	93.86		ug/L		94	70 - 130	0	20
Toluene			100	98.22		ug/L		98	70 - 130	1	20
m-Xylene & p-Xylene			200	183.2		ug/L		92	70 - 130	4	20
o-Xylene			100	92.33		ug/L		92	70 - 130	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*
1,4-Difluorobenzene (Surr)	*100*		*70 - 130*

Lab Sample ID: 820-139-B-4 MS
Matrix: Water
Analysis Batch: 750

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	<2.00	U	100	96.80		ug/L		97	70 - 130		
Ethylbenzene	<2.00	U	100	95.39		ug/L		95	70 - 130		
Toluene	<2.00	U	100	101.2		ug/L		101	70 - 130		

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

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

Lab Sample ID: 820-139-B-4 MS
Matrix: Water
Analysis Batch: 750

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
m-Xylene & p-Xylene	<4.00	U	200	190.3		ug/L		95	70 - 130
o-Xylene	<2.00	U	100	91.70		ug/L		92	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*93*		*70 - 130*
1,4-Difluorobenzene (Surr)	*99*		*70 - 130*

Lab Sample ID: 820-139-B-4 MSD
Matrix: Water
Analysis Batch: 750

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	<2.00	U	100	99.07		ug/L		99	70 - 130	2	25
Ethylbenzene	<2.00	U	100	101.1		ug/L		101	70 - 130	6	25
Toluene	<2.00	U	100	104.3		ug/L		104	70 - 130	3	25
m-Xylene & p-Xylene	<4.00	U	200	201.7		ug/L		101	70 - 130	6	25
o-Xylene	<2.00	U	100	98.08		ug/L		98	70 - 130	7	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*97*		*70 - 130*
1,4-Difluorobenzene (Surr)	*101*		*70 - 130*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 880-549/3
Matrix: Water
Analysis Batch: 549

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			03/17/21 22:13	1

Lab Sample ID: LCS 880-549/4
Matrix: Water
Analysis Batch: 549

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	23.89		mg/L		96	90 - 110

Lab Sample ID: LCSD 880-549/5
Matrix: Water
Analysis Batch: 549

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	23.77		mg/L		95	90 - 110	1	20

QC Sample Results

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: 880-415-A-1 MS
Matrix: Water
Analysis Batch: 549

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	51.0		25.0	75.29		mg/L		97	90 - 110

Lab Sample ID: 880-415-A-1 MSD
Matrix: Water
Analysis Batch: 549

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	51.0		25.0	75.26		mg/L		97	90 - 110	0	20

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

Lab Sample ID: 3154281-1-BLK
Matrix: WATER
Analysis Batch: 3154281

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3154281_P

Analyte	BLANK Result	BLANK Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<5	U	5		mg/L		03/21/21 12:30	03/21/21 12:30	1

Lab Sample ID: 3154281-1-BKS
Matrix: WATER
Analysis Batch: 3154281

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3154281_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	987		mg/L		99	80 - 120

Lab Sample ID: 3154281-1-BSD
Matrix: WATER
Analysis Batch: 3154281

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 3154281_P

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids	1000	955		mg/L		96	80 - 120	3	10

Lab Sample ID: 692017-006 D
Matrix: WATER
Analysis Batch: 3154281

Client Sample ID: Duplicate
Prep Type: Total/NA
Prep Batch: 3154281_P

Analyte	Sample Result	Sample Qualifier	DUP Result	DUP Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	798		742		mg/L		7	10

QC Association Summary

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

GC VOA

Analysis Batch: 592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-387-2	TWM-3	Total/NA	Water	8021B	
880-387-3	TWM-2	Total/NA	Water	8021B	
880-387-4	TWM-4	Total/NA	Water	8021B	
880-387-5	Windmill	Total/NA	Water	8021B	
MB 880-592/8	Method Blank	Total/NA	Water	8021B	
LCS 880-592/3	Lab Control Sample	Total/NA	Water	8021B	
LCSD 880-592/4	Lab Control Sample Dup	Total/NA	Water	8021B	
890-344-A-1 MS	Matrix Spike	Total/NA	Water	8021B	
890-344-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8021B	

Prep Batch: 598

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 880-598/5-A	Method Blank	Total/NA	Water	5035	

Analysis Batch: 750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-387-1	TWM-1	Total/NA	Water	8021B	
880-387-6	Dup-1	Total/NA	Water	8021B	
MB 880-598/5-A	Method Blank	Total/NA	Water	8021B	598
MB 880-750/39	Method Blank	Total/NA	Water	8021B	
LCS 880-750/33	Lab Control Sample	Total/NA	Water	8021B	
LCSD 880-750/34	Lab Control Sample Dup	Total/NA	Water	8021B	
820-139-B-4 MS	Matrix Spike	Total/NA	Water	8021B	
820-139-B-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8021B	

HPLC/IC

Analysis Batch: 549

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-387-1	TWM-1	Total/NA	Water	300.0	
880-387-2	TWM-3	Total/NA	Water	300.0	
880-387-3	TWM-2	Total/NA	Water	300.0	
880-387-4	TWM-4	Total/NA	Water	300.0	
880-387-5	Windmill	Total/NA	Water	300.0	
880-387-6	Dup-1	Total/NA	Water	300.0	
MB 880-549/3	Method Blank	Total/NA	Water	300.0	
LCS 880-549/4	Lab Control Sample	Total/NA	Water	300.0	
LCSD 880-549/5	Lab Control Sample Dup	Total/NA	Water	300.0	
880-415-A-1 MS	Matrix Spike	Total/NA	Water	300.0	
880-415-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	300.0	

Subcontract

Analysis Batch: 3154281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-387-1	TWM-1	Total/NA	Water	TDS	3154281_P
880-387-2	TWM-3	Total/NA	Water	TDS	3154281_P
880-387-3	TWM-2	Total/NA	Water	TDS	3154281_P
880-387-4	TWM-4	Total/NA	Water	TDS	3154281_P
880-387-5	Windmill	Total/NA	Water	TDS	3154281_P
880-387-6	Dup-1	Total/NA	Water	TDS	3154281_P
3154281-1-BLK	Method Blank	Total/NA	WATER	TDS	3154281_P

QC Association Summary

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Subcontract (Continued)

Analysis Batch: 3154281 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
3154281-1-BKS	Lab Control Sample	Total/NA	WATER	TDS	3154281_P
3154281-1-BSD	Lab Control Sample Dup	Total/NA	WATER	TDS	3154281_P
692017-006 D	Duplicate	Total/NA	WATER	TDS	3154281_P

Prep Batch: 3154281_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
880-387-1	TWM-1	Total/NA	Water	NONE	
880-387-2	TWM-3	Total/NA	Water	NONE	
880-387-3	TWM-2	Total/NA	Water	NONE	
880-387-4	TWM-4	Total/NA	Water	NONE	
880-387-5	Windmill	Total/NA	Water	NONE	
880-387-6	Dup-1	Total/NA	Water	NONE	
3154281-1-BLK	Method Blank	Total/NA	WATER	***DEFAULT PREP***	
3154281-1-BKS	Lab Control Sample	Total/NA	WATER	***DEFAULT PREP***	
3154281-1-BSD	Lab Control Sample Dup	Total/NA	WATER	***DEFAULT PREP***	
692017-006 D	Duplicate	Total/NA	WATER	***DEFAULT PREP***	

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Client Sample ID: TWM-1
Date Collected: 03/11/21 08:53
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	750	03/24/21 02:09	PXS	XM
Total/NA	Analysis	300.0		1	549	03/17/21 23:08	CH	XM
Total/NA	Prep	NONE		1	3154281_P	03/21/21 12:30		XS
Total/NA	Analysis	TDS		1	3154281	03/21/21 12:30	DTN	XS

Client Sample ID: TWM-3
Date Collected: 03/11/21 09:12
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	592	03/20/21 10:50	MR	XM
Total/NA	Analysis	300.0		10	549	03/17/21 23:17	CH	XM
Total/NA	Prep	NONE		1	3154281_P	03/21/21 12:30		XS
Total/NA	Analysis	TDS		1	3154281	03/21/21 12:30	DTN	XS

Client Sample ID: TWM-2
Date Collected: 03/11/21 09:36
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	592	03/20/21 11:11	MR	XM
Total/NA	Analysis	300.0		10	549	03/17/21 23:26	CH	XM
Total/NA	Prep	NONE		1	3154281_P	03/21/21 12:30		XS
Total/NA	Analysis	TDS		1	3154281	03/21/21 12:30	DTN	XS

Client Sample ID: TWM-4
Date Collected: 03/11/21 10:05
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	592	03/20/21 11:31	MR	XM
Total/NA	Analysis	300.0		20	549	03/17/21 23:35	CH	XM
Total/NA	Prep	NONE		1	3154281_P	03/21/21 12:30		XS
Total/NA	Analysis	TDS		1	3154281	03/21/21 12:30	DTN	XS

Client Sample ID: Windmill
Date Collected: 03/12/21 13:26
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	592	03/20/21 11:52	MR	XM
Total/NA	Analysis	300.0		5	549	03/18/21 00:02	CH	XM
Total/NA	Prep	NONE		1	3154281_P	03/21/21 12:30		XS
Total/NA	Analysis	TDS		1	3154281	03/21/21 12:30	DTN	XS

Lab Chronicle

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Client Sample ID: Dup-1
Date Collected: 03/12/21 00:00
Date Received: 03/15/21 09:18

Lab Sample ID: 880-387-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	750	03/24/21 02:30	PXS	XM
Total/NA	Analysis	300.0		5	549	03/18/21 00:11	CH	XM
Total/NA	Prep	NONE		1	3154281_P	03/21/21 12:30		XS
Total/NA	Analysis	TDS		1	3154281	03/21/21 12:30	DTN	XS

Laboratory References:

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

XS = Eurofins Stafford, 4147 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

Accreditation/Certification Summary

Client: Larson & Associates, Inc. Job ID: 880-387-1
Project/Site: Apache-EBDU #37

Laboratory: Eurofins Xenco, Midland

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

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

Laboratory: Eurofins Stafford

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Texas	NELAP	T104704215-21-39	06-30-21

Method Summary

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

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

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:

XM = Eurofins Xenco, Midland, 1211 W. Florida Ave, Midland, TX 79701, TEL (432)704-5440
XS = Eurofins Stafford, 4147 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

Sample Summary

Client: Larson & Associates, Inc.
Project/Site: Apache-EBDU #37

Job ID: 880-387-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
880-387-1	TWM-1	Water	03/11/21 08:53	03/15/21 09:18	
880-387-2	TWM-3	Water	03/11/21 09:12	03/15/21 09:18	
880-387-3	TWM-2	Water	03/11/21 09:36	03/15/21 09:18	
880-387-4	TWM-4	Water	03/11/21 10:05	03/15/21 09:18	
880-387-5	Windmill	Water	03/12/21 13:26	03/15/21 09:18	
880-387-6	Dup-1	Water	03/12/21 00:00	03/15/21 09:18	

880-387 Chain of Custody

№ 1539

CHAIN-OF-CUSTODY

Larson & Associates, Inc.
Environmental Consultants
N. Marienfeld, Ste. 200
Midland, TX 79701
432-687-0901

Data Reported to

DATE: 3/15/2021 PAGE 1 OF 1

PO#: LAB WORK ORDER#:

PROJECT LOCATION OR NAME: Apache - EBDU #32

LAI PROJECT #: 19-0112-49 COLLECTOR: RN, TJ MS

TRRP report? ☐ Yes ☒ No

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

TIME ZONE
Time zone/State: MST

PRESERVATION: HCl x3 | HNO_3 | H_2SO_4 ☐ NaOH ☐ | ICE x2 | UNPRESSERVED

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 ☐ CYANIDE ☐ | pH ☐ HEXAVALENT CHROMIUM ☐ | EXPLOSIVES ☐ PECHLORATE ☐ | CHLORIDES ☒ ANIONS ☐ ALKALINITY ☐

Field Sample I D	Lab #	Date	Time	Matrix	# of Containers	HCl x3	HNO_3	H_2SO_4 ☐ NaOH ☐	ICE x2	UNPRESSERVED	BTEX ☒	TDS ☒	CHLORIDES ☒	FIELD NOTES
TMW-1		3/11/21	0853	W	5						X			Direct Bill to Apache
TMW-3			0912											
TMW-2			0936											
TMW-4			1005											Liter, 250, 3 VOA + HCl
windmill		3/12/21	1326											
Dup-1				W										
TOTAL														

RELINQUISHED BY (Signature) DATE/TIME 3/15/21 918 RECEIVED BY (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 3.0/3.5 THERM# IR8
CUSTODY SEALS - ☐ BROKEN ☐ INTACT ☐ NOT USED
☐ CARRIER BILL #
☐ HAND DELIVERED

Login Sample Receipt Checklist

Client: Larson & Associates, Inc. Job Number: 880-387-1

Login Number: 387 **List Source: Eurofins Midland**
List Number: 1
Creator: Teel, Brianna

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 33961

CONDITIONS

Operator: APACHE CORPORATION 303 Veterans Airpark Ln Midland, TX 79705	OGRID: 873
	Action Number: 33961
	Action Type: [C-141] Release Corrective Action (C-141)

CONDITIONS

Created By	Condition	Condition Date
chensley	The OCD approves Apache's continued quarterly monitoring of groundwater in wells TMW-1 through TMW-4 and the windmill during 2021 with laboratory analysis of groundwater samples for BTEX, chloride and TDS.	7/16/2021