

**STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION**

**APPLICATION OF APACHE CORPORATION FOR  
AN ADJUDICATORY HEARING TO CONTEST  
THE DIVISION'S CONDITIONS OF APPROVAL  
ON APACHE CORPORATION'S SCOPE OF WORK  
FOR ADDITIONAL INVESTIGATION,  
LEA COUNTY, NEW MEXICO.**

**CASE NO.:** \_\_\_\_\_

**APPLICATION FOR ADJUDICATORY HEARING**

Apache Corporation ("Apache" or "Applicant") (OGRID No. 873), through its undersigned attorneys, files this application ("Application") with the Oil Conservation Division ("OCD" or "Division"), pursuant to the provisions of 19.15.4.8 and 19.15.29.12.C(5) NMAC, requesting an adjudicatory hearing to contest the OCD's Conditions of Approval on Action No. 342416, Apache's Scope of Work for Additional Investigation in Lea County, New Mexico, related to EBDU No. 37, Incident No. NDHR1922141227 (remediation permit number 1RP-5636).

In support of its Application, Apache states as follows:

1. Apache is the operator of record of the East Blinebry Drinkard Unit #037 well, also known as "EBDU #37" ("the Well"), API No. 30-025-06556, a water injection well, located in Section 13, Township 21 South, Range 37 East, in Lea County, New Mexico.
2. On July 14, 2019, Apache notified the OCD of a release at a pipeline junction approximately 720 feet east of the Well (the "Release") by filing a C-141 Initial Response Form.
3. On October 29, 2019, Apache submitted to OCD its Remediation Plan, which was approved with conditions on December 23, 2019.

4. On July 16, 2021, OCD approved Apache's 1RP-5636 Annual Groundwater Monitoring Report, containing reports from December 2019 through December 2020, with quarterly monitoring to continue through 2021.

5. On August 27, 2021, OCD approved Apache's 1RP-5636 Closure Report for the soil remediation, with no Conditions.

6. OCD requested that Apache conduct further delineation and install two additional groundwater monitoring wells, prior to August 8, 2022. On October 3, 2022, OCD proposed approximate location sites for two additional groundwater monitoring wells.

7. Between November 28 and 30, 2022, Apache installed the requested two additional monitoring wells.

8. On April 4, 2023, Apache installed four additional monitoring wells near the release sources at the request of OCD. On May 5, 2023, OCD approved Apache's Scope of Work for four additional monitoring wells, in reference to 1RP-5636, submitted by Apache on April 5, 2023, subject to certain Conditions of Approval.

9. Between November 29, 2023 and December 13, 2023, Apache installed fourteen (14) additional monitoring wells at locations approved by OCD on November 14, 2023. Apache collected samples from all existing sampling locations for analysis and submitted the results of the analysis to OCD in January, 2024.

10. Following receipt of the groundwater monitoring report, OCD informally requested that Apache conduct additional investigations. Following consultation between Apache and OCD, on May 8, 2024, Apache submitted its Scope of Work for Additional Investigation, Lea County, New Mexico, to the OCD, in reference to 1RP-5636 (Incident No. NDHR1922141227). This Scope of Work reflected what had been discussed between the parties just one week earlier and

contained a plan to install five (5) additional monitoring wells and proposed to discontinue groundwater monitoring at the windmill.

11. On July 24, 2024, OCD approved Apache's May 8, 2024 Scope of Work plan but with several Conditions of Approval, including installation of thirteen (13) or fourteen (14) additional groundwater monitoring wells – far more than what had been discussed or is necessary. *See* Ex. 1, Conditions of Approval to Apache's May 8, 2024 Scope of Work for Additional Investigation ("Conditions of Approval").

12. On August 6, 2024, counsel for Apache sent a letter to OCD noting Apache's concern with the July 24, 2024 Conditions of Approval. Between August 6 and September 25, Apache and OCD conferred regarding Apache's objections to the Conditions of Approval, including engaging in dispute resolution under 19.15.30.20 NMAC. During this time, Apache attempted to address OCD's concerns by submitting a revised Work Plan under which Apache would perform additional delineation. *See* Ex. 2, Additional Groundwater Delineation Work Plan (Sept. 24, 2024). This was submitted to OCD on September 24, 2024, and was rejected without any substantive commentary or insights as to why the plan was inadequate.

13. Less than twenty-four hours after Apache submitted its revised Work Plan, OCD—on September 25, 2024—notified Apache that it intended to cancel further meetings and terminate efforts to resolve Apache's concerns. OCD's September 25, 2024 email advised Apache to file an application for hearing under 19.15.29.12.C(5) NMAC within seven (7) days if Apache wished to contest the OCD's Conditions of Approval or be subject to a Notice of Violation if Apache did not file such application by October 4, 2024.

14. Pursuant to the Oil and Gas Act, NMSA 1978, Section 70-2-6, the OCD and the Oil Conservation Commission ("OCC") have jurisdiction and authority over all matters relating to

oil and gas conservation, the prevention of waste, and the protection of correlative rights and disposition of waste. 19.15.4.3 NMAC.

15. Apache has standing as an operator of the Well, and therefore may initiate an adjudicatory hearing in accordance with 19.15.4.8(A) NMAC.

WHEREFORE, Apache respectfully that this Application be set for hearing before an Examiner of the Oil Conservation Division, on the Division's November 7, 2024 docket, and, after notice and hearing as required by law, the Division enter an order:

A. Striking the OCD's July 24, 2024 Conditions of Approval to Apache's May 8, 2024 Scope of Work for Additional Investigation; and

B. Approving Apache's September 24, 2024 Additional Groundwater Delineation Work Plan with no Conditions.

Respectfully submitted,

**GALLAGHER & KENNEDY, PA**

/s/ Dalva Moellenberg

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Draft Notice for Publication:

CASE No.: \_\_\_\_\_

**Application of Apache Corporation for An Adjudicatory Hearing to Contest the Divisions' Conditions of Approval on Apache Corporation's Scope of Work for Additional Investigation, Lea County, New Mexico.** Applicant in the above-styled cause seeks an order (a) striking the OCD's July 24, 2024 Conditions of Approval to Apache's May 8, 2024 Scope of Work for Additional Investigation; and (b) approving Apache's September 24, 2024 Additional Groundwater Delineation Work Plan with no Conditions. This cause stems from EBDU No. 37, Incident No. NDHR1922141227 (1RP-5636). Apache is the operator of the East Blinebry Drinkard Unit #037 well, also known as "EBDU #37" ("the Well"), API No. 30-025-06556, a water injection well, located in Section 13, Township 21 South, Range 37 East, in Lea County, New Mexico. Said area is located approximately 3 miles northeast of Eunice, New Mexico. Hearing of the above-styled cause will take place on November 7, 2024, before the Oil Conservation Division. Counsel for Apache Corporation, Dalva Moellenberg and Samantha Catalano, both of GALLAGHER & KENNEDY, PA, can be reached at [d1m@gknet.com](mailto:d1m@gknet.com) and [samantha.catalano@gknet.com](mailto:samantha.catalano@gknet.com), and at 1239 Paseo de Peralta, Santa Fe, New Mexico, 87501.



**EXHIBIT 1**

May 8, 2024

VIA EMAIL: [RosaM.Romero@emnrd.nm.gov](mailto:RosaM.Romero@emnrd.nm.gov)  
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Ms. Rosa M. Romero  
Environmental Bureau Chief  
State of New Mexico – Oil Conservation Division  
1220 S. St. Francis Drive  
Santa Fe, New Mexico 87505

**Re: Apache Corp., EBDU #37 Incident NDHR1922141227 (1RP-5636) - Scope of Work for Additional Investigation, Lea County, New Mexico**

Dear Ms. Romero:

Larson & Associates, Inc. (LAI), on behalf of Apache Corp. (Apache), has prepared this scope of work (SOW) for the produced water release at the East Blinbry Drinkard Unit (EBDU) #37 (Site) located in Unit E (SW/4, SW/4), Section 13, Township 21 South and Range 37 East in Lea County, New Mexico. The geodetic position is North 32.479569° and West - 103.122061°. Mr. William “Bill” Stevens is the surface owner. Figure 1 presents a topographic map.

The SOW is in response to video/telephone calls on April 1, 2024 and May 1, 2024, between Apache, New Mexico Oil Conservation Division (NMOCD) and LAI representatives. During the call on April 1, 2024, NMOCD requested Apache to:

- Install additional monitoring well (TMW-28) north of TMW-11 and TMW-12 to establish the northern (upgradient) limit or background for chloride in groundwater.
- Install additional monitoring well south (TMW-25) of TMW-23 and TMW-24 to establish the southern extent for chloride in groundwater.
- Determine the source for chloride (5,850 mg/L) reported in the groundwater sample from monitoring well TMW-17.
- Implement measures to prevent further impact to the onsite water well (windmill) from chloride.
- Collect and analyze groundwater samples from the water well (windmill) for the entire list of constituents in 20.6.2.3102 NMAC including Human Health Standards in A (1) (a) through (tt), Other Standards for Domestic Water Supply in B. (1) through (10), and Standards for Irrigation Use in C (1) through (5).

On May 1, 2024, the following was requested:

- Install a monitoring well (TMW-29) north (up gradient) from monitoring well TMW-13.
- Update the analytical data table with complete analysis of the groundwater sample collected from the windmill on April 3, 2024.
- Collect and analyze groundwater samples for barium from monitoring wells TMW-1, TMW-3, and TMW-21.

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## **Background**

On July 14, 2019, Apache reported a produced water release from a flowline at a pipeline junction located about 720 feet east from EBDU 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. Appendix A presents the initial C-141.

The spill area was remediated according to a remediation plan titled, "1RP-5636 REMEDIATION PLAN, East Blinbry Drinkard Unit #37 Produced water Spill, Lea County, New Mexico", submitted to the NMOCD October 29, 2019. On December 23, 2019, NMOCD approved the remediation plan addendum based on a telephone call on December 20, 2019 (Bradford Billings) with following conditions:

- Installed four (4) monitoring wells (TMW-1 through TMW-4).
- Performed quarterly (4 times per year) groundwater monitoring from monitoring wells and a water well (windmill).

In all, Apache has spent over \$750,000 to ensure the remediation was thorough and properly done in accordance with the NMOCD approved plan.

## **Investigations**

Between November 28 and 30, 2022, at NMOCD's request, Apache installed two (2) monitoring wells (TMW-5 and TMW-6) east of the playa where the release terminated. Soil samples were collected from seven (7) bores including BH-1, BH-3, BH-4, and BH-5 located in the playa with the remaining bores (BH-6, BH-7, and BH-8) located in the release corridor north of the playa.

Following a conference call with NMOCD On April 4, 2023, Apache installed four (4) additional monitoring wells (TMW-7 through TMW-10) near the sources for the release (TMW-7), north of the playa (TMW-8) and west (TMW-9) and east (TMW-10) of TMW-1 near the south end of the playa. Figure 2 presents an aerial map for the soil borings and monitoring wells.

Apache requested LAI to prepare a plan for installing additional monitoring wells following a call with NMOCD on October 30, 2023. The plan was submitted to NMOCD on November 10, 2023. Between November 29, 2023 and December 13, 2023, Scarborough Drilling Inc. (SDI), under LAI oversight, installed fourteen (14) additional monitoring wells (TMW-11 through TMW-24) at locations specified in the scope of work (SOW) approved by NMOCD on November 14, 2023. NMOCD specified a monitoring well (TMW-17) be installed halfway between existing monitoring well TMW-5 and proposed monitoring well TMW-15. SDI drilled the inner ring of monitoring wells (TMW-11 through TMW-16) prior to installing the outer ring of monitoring wells (TMW-18 through TMW-22) based on laboratory analysis of groundwater samples for chloride. Two (2) additional wells (TMW-23 and TMW-24) installed south of TMW-18 and TMW-19 based on field chloride tests. Figure 2 presents the monitoring well locations. Appendix B presents NMOCD communications. Appendix C presents the laboratory chloride analysis.

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SDI installed the monitoring wells in 5-inch diameter borings that were advanced with an air rotary rig between about sixty (60) feet (TMW-24) and eighty-nine (89) feet bgs. The monitoring wells were constructed in accordance with ASTM Designation: D5092 - Reapproved 2010 (*Standard Practice for Design and Installation of Groundwater Monitoring Wells*) with 2-inch diameter schedule 40 PVC casing and twenty (20) feet of 0.010-inch factory slotted screen that was positioned above and below the groundwater level observed during drilling. Graded silica sand was placed in the annuls between the borehole and well to about 2-feet above the screen. The remainder of the annulus was filled to about 1-foot bs with bentonite chips and hydrated with potable water. The wells were secured with locking steel covers anchored concrete. Land Point Surveying, Midland, Texas, a State of New Mexico licensed professional land surveying firm, surveyed the wells for location and elevation including ground surface and top of casing (TOC). Drill cuttings were examined based on the Unified Soil Classification System (USCS) according to ASTM Designation: D2487 (*Standard Practice for Classification of Soils for Engineering Purposes*). Table 1 presents the monitoring well drilling and completion details. Appendix D presents the lithologic logs and well completion records.

Monitoring wells TMW-20 through TMW-24 terminated in silty clay (red bed) of the Triassic-age Chinle Formation (Dockum Group) between about sixty-three (63) feet bgs (TMW-24) and seventy-eight (78) feet bgs (TMW-20). An unconformity occurs between the silty clay (Chinle Formation) and overlying Ogallala Formation, consisting of fine-to-fine grained quartz sand. There are few distinctions between the Ogallala Formation and overlying Blackwater Draw Formation with color being a distinction from reddish yellow to reddish orange. The sand thickness increases from east to west towards Monument Draw and is mostly controlled by the eroded Chinle Formation. A layer of carbonate-indurated sand (caliche) likely caused where a zone of illuviation where carbonate dust accumulated from surface transportation by meteoric water movement, occurs above the sand and extends from near the surface and to about twenty (20) feet bgs. Figure 3 presents an aerial drawing showing the monitoring well locations lines of geological cross sections. Figure 3a through Figure 3d present the geological cross sections.

On December 20 and 21, 2023, groundwater was recorded in the Ogallala Formation between about 46.91 feet bgs (TMW-1) and 65.97 feet bgs (TMW-22). The saturated thickness ranged from about 6.97 feet (TMW-24) to greater than 26.22 feet (TMW-18). The groundwater potentiometric surface elevation ranged between 3,365.57 feet above mean sea level (MSL) at TMW-12 (up gradient) and 3,362.33 feet above MSL at TMW-24 (down gradient). The groundwater flow direction was generally from north to south at a gradient of about 0.003 feet per foot. Figure 4 presents the groundwater saturated thickness map for December 20 and 21, 2023. Figure 5a presents the groundwater potentiometric surface map for December 20 and 21, 2023.

On March 14, 2024, groundwater was recorded in the Ogallala Formation between about 46.78 feet bgs (TMW-1) and 65.96 feet bgs (TMW-22). Between December 21, 2023 and March 14, 2024, depth to groundwater decreased (rising aquifer conditions) between 0.01 feet (TMW-22) and 1.38 feet (TMW-11). During this same period, depth to groundwater increased 0.06 feet (TMW-05) and 0.98 feet (TMW-19) which represents falling aquifer conditions. The rising and lowering groundwater conditions are likely the result of seasonal fluctuation in the aquifer. On March 14, 2024, the groundwater potentiometric surface elevation ranged between 3,365.65 feet above mean sea level (MSL) at TMW-12 (up gradient) and 3,362.84 feet above MSL at TMW-23 (down gradient). The groundwater flow direction was generally from north to south at a gradient of about 0.003 feet per foot. Groundwater mounding near well TMW-4 from a slightly elevated groundwater potentiometric surface elevation causes groundwater to flow to the west, east and south. A slight reversal in the groundwater flow direction was observed in the vicinity of TMW-19 and TMW-24, from increased (rising) groundwater

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potentiometric surface elevation in TMW-24 (3,362.40 feet) and decreased (falling) groundwater potentiometric surface elevation at TMW-19 (3,361.88 feet) causes groundwater to flow towards TMW-19. Figure 5b presents the groundwater potentiometric surface map for March 14, 2024.

Groundwater samples were collected from monitoring wells with the TMW-1 through TMW-24 and the windmill on December 20 and 21, 2023 and March 14, 2024. Duplicate samples were collected for laboratory quality assurance and quality control (QA/QC) from wells TMW-17 and TMW-2 on December 20 and 21, 2023, respectively, from TMW-3 and TMW-14 on March 14, 2024. The groundwater samples, except from the windmill, were collected using the low stress or low flow method, according to EPA protocol (EQASOP-GW4, Revision 4, September 19, 2017). The low stress or low flow method where an environmental pump was submerged near the middle of the water column and the well was pumped at a low rate until environmental parameters stabilized. Groundwater samples were collected from the discharge of the dedicated disposable Tygon® tubing. Groundwater samples from the windmill were collected from the end of the discharge pipe before the stock tank. The Tygon® tubing was discarded after each use and the pump was thoroughly cleaned with a solution of potable water and laboratory grade detergent (Alconox®) and rinsed with distilled water. The samples were delivered under preservation and chain of custody to Eurofins Xenco Laboratories, Midland, Texas, which analyzed the samples for benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA SW-846 Method 8021B, chloride by EPA Method 300 and total dissolved solids (TDS) by Method SM2540C. Table 2 presents the laboratory analytical data summary. Appendix E presents the laboratory reports.

BTEX compounds were not reported in the groundwater samples at concentrations above the analytical reporting limits (RP) in samples including duplicate samples collected on December 20 and 21, 2023 or March 14, 2024.

On December 20 and 21, 2023, chloride was reported in groundwater samples from monitoring wells TMW-1 through TMW-24 and the windmill at concentrations from 37.3 mg/L in monitoring well TMW-10 to 5,850 mg/L in groundwater from monitoring well TMW-17. The background chloride concentration was 463 mg/L (TMW-12). The chloride concentration in the windmill sample was 409 mg/L. On March 14, 2024, chloride was reported in groundwater samples at concentrations from 17.0 mg/L (TMW-10) to 5,680 mg/L (TMW-17). The background chloride concentration was 448 mg/L from monitoring well TMW-12. The chloride concentration in the windmill sample was 471 mg/L. Figure 6a and Figure 6b present isopleth maps for chloride concentrations in groundwater samples collected on December 20 and 21, 2023 and March 14, 2024, respectively.

On December 20 and 21, 2023, TDS was reported in groundwater samples from the monitoring wells and windmill at concentrations from 404 mg/L (TMW-9) and 10,300 mg/L (TMW-17). The background TDS concentration was 1,520 mg/L (TMW-12). The TDS concentration in the windmill sample was 1,010 mg/L. On March 14, 2024, TDS was reported in groundwater samples at concentrations from 373 mg/L (TMW-9) to 8,930 mg/L (TMW-17). The background TDS concentration was 1,390 mg/L from monitoring well TMW-12. The TDS concentration in the windmill sample was 1,080 mg/L. Figure 7a and Figure 7b present isopleth maps for TDS concentrations in groundwater samples collected on December 20 and 21, 2023 and March 14, 2024, respectively.

On April 3, 2024, at the request of NMOCD, Apache requested LAI personnel to collect a groundwater sample from the windmill for analysis of New Mexico Water Quality Control Commission (WQCC) human health, domestic water quality and irrigation "3103" parameters in 20.6.2.3103 NMAC. The sample was collected from the discharge pipe near the windmill

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and delivered under preservation and chain of custody to Xenco laboratories located in Midland, Texas. Table 3 presents the laboratory data summary. Appendix F presents the laboratory reports.

The laboratory reported barium (2.18 mg/L) and chloride (440 mg/L) above the WQCC human health and domestic water quality standards of 2.0 mg/L and 250 mg/L, respectively, on April 3, 2024.

On May 2, 2024, following the video/telephone call on May 1, 2024, LAI personnel collected groundwater samples from monitoring wells TMW-1, TMW-3, TMW-21, and windmill. The samples were delivered under preservation and COC to Xenco, which analyzed the samples for dissolved barium by EPA SW-846 Method 6020B. Table 2 presents the monitoring well and windmill analytical data summary. According to 20.6.2.3103, "the standards apply to the dissolved portion of the contaminants specified with a definition of dissolved being that given in the publication *methods for chemical analysis of water and waste of the U.S. environmental protection agency*", with the exception that standards for mercury, organic compounds and non-aqueous liquids shall apply to the total nonfiltered concentrations of the contaminants". The initial sample from the windmill (April 3, 2024) was an unfiltered (total) analysis and therefore not valid for comparison to the standards in 20.6.2.3103NMAC. Samples collected on May 2, 2024, were filtered by the laboratory, and represent dissolved barium concentrations which are below the NMWQCC human health standard of 2.0 mg/L in 20.6.2.3103A(1) NMAC. The dissolved barium concentrations reported between 0.0299 mg/L (TMW-3) and 0.445 mg/L (TMW-1). The dissolved barium concentration in the windmill sample on May 2, 2024, was 0.220 mg/L.

Apache does not believe the any additional analysis is necessary and will discontinue collecting samples from the windmill for the "3103" parameters.

### **Scope of Work**

Apache suspects the source of the chloride in groundwater from TMW-17 to be the same source for the spill. The source may have begun as an undetected pin-hole leak that migrated vertically to groundwater resulting in a density-driven chloride plume that migrated southward along the lower contact with the Triassic Dockum Group. To investigate this possible source scenario, boring BH-9 will be drilled near the junction box and monitoring well TMW-7. The soil samples will be collected with an air rotary rig beginning at ground surface and every five (5) feet to approximately fifty-five (55) feet bgs. The samples will be submitted to Xenco under chain of custody and analyzed for chloride by EPA Method 300. Figure 8 presents the approximate boring location.

Apache will install five (5) additional monitoring wells (TMW-25 through TMW-29) at locations shown on Figure 8a and Figure 8b. Monitoring well TMW-25 will be installed about 500 feet south of TMW-23 and TMW-24 to establish the downgradient limit of chloride in groundwater. Monitoring well TMW-26 will be installed about halfway between TMW-20 and TMW-23 to establish the downgradient and cross gradient concentration of chloride in groundwater. Monitoring well TMW-27 will be installed about 275 feet north-northwest of TMW-17 to confirm if chloride in groundwater is migrating southward from the junction box and is a suspect source for the release. This well will be completed as a recovery test well further described below. Monitoring well TMW-28 will be installed about 375 feet north of TMW-11 and TMW-12 to establish the up gradient or background chloride concentration in groundwater. Monitoring well TMW-29 will be installed about 375 feet north of TMW-13 to evaluate an additional source for the chloride and to establish the up gradient or background chloride concentration in groundwater.

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Applications will be prepared and submitted to the State of New Mexico Office of the State Engineering (NMOSE) for approval and prior to installing monitoring wells TMW-25 through TMW-29. The wells will be installed about twenty (20) feet into the uppermost groundwater unit calculated to occur at depths between about fifty-five (55) feet at TMW-27 and TMW-28 and sixty (60) feet bgs at the remaining locations. Drilling will terminate about two (2) feet into the lower confining unit (Triassic Dockum Group), if encountered. The wells will be completed in a nominal 5-inch diameter bore except MW-27 that will be advanced with an air rotary rig. Potable water may be introduced during drilling to remove drill cuttings from the boreholes. The lithologies will be described and logs prepared according to ASTM D-2487 (*Standard Practice for Classification of Soils for Engineering Purposes*). The wells will be secured with locking steel covers anchored into a concrete apron measuring about 3 by 3 feet and about 4-inches thick. Land Point Surveying, Midland, Texas, will survey the wells for position and elevation including natural ground and top of casing (TOC). The following is a summary of the calculated depth to groundwater, proposed drilling and well screen depths:

Monitoring Well	Depth to Groundwater, Feet bgs	*Well Depth, Feet bgs	Well Screen Interval, Feet bgs
TMW-25	60	80	60 – 80
TMW-26	60	80	60 – 80
TMW-27	55	95	75 - 95
TMW-28	55	75	55 – 75
TMW-29	60	80	60 - 80

\*Drilling will terminate about 2 feet into the lower confining unit (red bed) if encountered.

The wells will be developed by pumping with an electric submersible or mechanical pump to remove sediment disturbed during drilling and well installation. The pump will be fitted with new polyethylene discharge tubing that will be discarded between wells. The foot valve will be thoroughly cleaned between wells with a solution of laboratory-grade detergent (Alconox®) and rinsed distilled water. Purged water and sediment will be captured in 55-gallon drums for disposal in a NMOCD permitted Class II commercial salt-water disposal (SWD) well.

Groundwater will be allowed to recover to near the pre-development level before collecting groundwater samples. Depth to groundwater will be gauged at TOC with an electronic water level meter. Groundwater samples will be collected from each monitoring well including the existing monitoring wells (TMW-1 through TMW-24) using the low stress or low flow method according to EPA protocol (EQASOP-GW4, Revision 4, September 19, 2017) where an environmental pump is submerged near the middle of the water column and the well is pumped at a low rate until environmental parameters stabilize. Groundwater samples were collected from discharge through disposable Tygon® tubing. The tubing was discarded after each use and the pump was thoroughly cleaned with a solution of potable water and Alconox® and rinsed with distilled water. The sample from the windmill will be collected from the pump discharge pipe. The samples will be transferred to labeled laboratory containers, packed in an ice chest filled with ice, and delivered under chain of custody Xenco in Midland, Texas. Two (2) duplicate samples will be collected for laboratory quality assurance and quality control (QA/QC). Xenco will analyze the samples for benzene, toluene, ethylbenzene, xylene (BTEX) according to EPA SW-846 Method SW-8260D, cations (calcium, magnesium, potassium, and sodium) by Method SW-6020B, anions (chloride and sulfate) by EPA Method 300, alkalinity by EPA Method M-2320B, and total dissolved solids (TDS) by EPA Method M-2540C.

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## **Remediation**

Apache proposes to complete monitoring well TMW-27 as a remediation test well (RW-1). The well will be installed in an appropriately sized borehole that will be advanced using air and water rotary drilling methods to near the top of the lower confining unit (red bed) estimated to occur between about eighty-five (85) and ninety-five (95) feet bgs. Potable water will be used to remove drill cuttings from the boreholes. The well will be constructed with a 5-inch schedule 40 PVC casing and screen with glued joints as no organic compounds (i.e., BTEX) have been detected in groundwater samples. The well screen approximately 20 to 25 feet in length will be 0.020-inch factory slotted and will be positioned near the bottom of the borehole. The well screen will be surrounded with graded silica sand or gravel compatible with the screen opening (0.020 inches) and will extend from near the bottom of the well to about 2 feet above the screen. The remaining annulus above the sand will be filled with bentonite chips to approximately 1-foot bgs and hydrated with potable water. An electric submersible pump will be used to evaluate the well yield and radius of influence during a pumping test. Water from drilling and pumping the well will be captured in portable (frac) tanks and disposed of in an NMOCD permitted commercial saltwater disposal (SWD) well. Options for managing the pump discharge during remediation will be evaluated based on the pumping test. Apache will work with the State of New Mexico Office of the State Engineer (OSE) for authorization to produce water from the recovery well for the remediation project. Apache will conduct semi-annual (twice yearly) monitoring of groundwater in the monitoring wells (TMW-1 through TMW-28 and recovery well (RW-1). The samples will be analyzed for BTEX, chloride, and TDS. It is anticipated that the groundwater remediation system will be operated between approximately 3 and 5 years. Apache will submit the remediation program results to the NMOCD in annual (once per year) reports that will include a summary of water volumes recovered and treated, laboratory analytical data summary tables, groundwater potentiometric surface maps, isopleth maps for chloride and TDS, and laboratory reports. Apache will provide notification to NMOCD and landowner at least 7 days in advance of each event, excluding weekends.

Apache will discontinue monitoring groundwater from the windmill for WQCC human health, domestic water quality and irrigation standards in 20.6.2.3103, based on only barium (2.18 mg/L) and chloride (440 mg/L) being detected above the WQCC human health and domestic water quality standards of 2.0 mg/L and 250 mg/L, respectively, on April 3, 2024.

Your approval of this SOW for additional investigation and proposed remediation test well is requested. Please contact Barrett Bole with Apache at (432) 818-1108 or email [Barrett.Bole@apachecorp.com](mailto:Barrett.Bole@apachecorp.com), Bruce Baker with Apache at (432) 631-6982 or email [Larry.Baker@apachecorp.com](mailto:Larry.Baker@apachecorp.com), Daniel St. Germain at (432) 664-5357 or [dstgermain@laenvironmental.com](mailto:dstgermain@laenvironmental.com) or me to discuss any questions you may have.

Respectively,

**Larson & Associates, Inc.**



Mark J. Larson, P.G.  
President/Sr. Hydrogeologist  
Certified Professional Geologist #10490

Encl.

507 North Marienfeld, Suite 202 ♦ Midland, Texas 79701 ♦ Ph. (432) 687-0901 ♦ Fax (432) 687-0456

**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 342416

**CONDITIONS**

Operator: APACHE CORPORATION 303 Veterans Airpark Ln Midland, TX 79705	OGRID: 873
	Action Number: 342416
	Action Type: [UF-GWA] Ground Water Abatement (GROUND WATER ABATEMENT)

**CONDITIONS**

Created By	Condition	Condition Date
michael.buchanan	As a result of significant differences in groundwater flow direction at the source area shown between Figure 5a and Figure 5b from December 2023 to March 2024 in the SOW, a denser network of monitoring wells is necessary to better characterize the mass source in the area. Apache Corporation must develop the following within ninety (90) days of this approval date for additional well borings and the subsequent conditions of approval below. The coordinates for each additional monitoring well required for installation by OCD are included in conditions 1. (a through n). 1a. TMW-30 shall be installed approximately 430 feet east of the TMW-28 well proposal, and 50 feet south. Better defining background concentrations. (32.482591, -103.120003)	7/24/2024
michael.buchanan	1b. TMW-31 shall be installed approximately 350 feet northwest of TMW-22. Reduces the distance between TMW-12 and TMW-22 for more precise characterization. (32.481806, -103.119008) 1c. TMW-32 shall be installed approximately 275 feet east of TMW-12. Reduces distance between adjacent wells for more precise characterization. (32.481354, -103.119876) 1d. TMW-33 shall be installed approximately 415 feet southwest of TMW-22. Reduces the distance between TMW-21 and TMW-13 for more precise characterization. (32.480643, -103.118728) 1e. TMW-34 shall be installed approximately 350 feet west of TMW-14. Achieves more characterization near TMW-17 which conveys a high chloride level. (32.479492, -103.120080) 1f. TMW-35 shall be installed approximately 190 feet northeast of TMW-15 Addresses more necessary characterization near TMW-17 (32.479341, -103.119302)	7/24/2024
michael.buchanan	1g. TMW-36 shall be installed approximately 175 feet southwest of TMW-17. Addresses need for more characterization near TMW-17 (32.478749, -103.120871) 1h. TMW-37 shall be installed approximately 275 feet southeast of TMW-17. Addresses need for more characterization near TMW-17. (32.478577, -103.119850) 1i. TMW-38 shall be installed approximately 300 feet northwest of proposed TMW-26. More characterization and assessment needed in the southeast region of the release area. (32.477683, -103.119429) 1j. TMW-39 shall be installed approximately 200 feet southeast of TMW-18. The release area in southeast area needs tighter monitoring network of characterization and assessment for chloride. (32.477447, -103.120144) 1k. TMW-40 shall be installed approximately 200 feet southeast of TMW-16. Addresses lack of characterization and assessment between MW-19 and MW-18 (32.477640, -103.121407)	7/24/2024
michael.buchanan	1l. TMW-41 shall be installed approximately 275 feet east of TMW-24. Addresses lack of characterization and assessment between TMW-24 and TMW-23 (32.476499, -103.121560) 1m. TMW-42 shall be installed approximately 220 feet east of TMW-23. Addresses lack of characterization and assessment between TMW-25 and TMW-26 (32.476456, -103.119774) 1n. TMW-42 shall be installed approximately 75 feet NE of TMW-13. Addresses lack of characterization between TMW-13 and TMW-22. (32.4811185, -103.1189847) 2. A current and up-to-date site map showing proposed monitoring wells in the SOW, and the additional thirteen (14) monitoring wells prescribed by OCD for further characterization and assessment of chlorides and BTEX. 3. Any quarterly monitoring collected to the present (summary table and lab analyses are sufficient).	7/24/2024
michael.buchanan	4. The windmill well must be sampled and analyzed for barium in the next round of groundwater monitoring. 5. Both TMW #5 and TMW #17 must be sampled for all human health standard constituents in the NM WQCC list in subsections A, B and C of 20.6.2.3103 NMAC as these two wells had the highest concentrations of contamination. 6. All proposed monitoring wells in the Scope of Work for Additional Investigation and the additional required monitoring wells by OCD must have soil sample analyses for TPH, chloride, and BTEX by EPA Methods 8260, EPA Method 300 and EPA Method 8015. Five (5) foot interval composite samples are acceptable. 7. Drilling for all wells is required to commence within ninety (90) days from this date of approval.	7/24/2024
michael.buchanan	8. 19.15.5.11 ENFORCEABILITY OF PERMITS AND ADMINISTRATIVE ORDERS: A person who conducts an activity pursuant to a permit, administrative order or other written authorization or approval from the division shall comply with every term, condition and provision of the permit, administrative order, authorization or approval. [19.15.5.11 NMAC - Rp, 19.15.1.41 NMAC, 12/1/2008]	7/24/2024



**EXHIBIT 2**

5847 50<sup>th</sup> Street  
Lubbock, TX 79424  
P (806) 300-0140  
F (806) 797-0947  
[Terracon.com](http://Terracon.com)

September 23, 2024

New Mexico Oil Conservation Division (NMOCD)  
EMNRD/OCD  
8801 Horizon Blvd NE, Suite 260  
Albuquerque, NM 87113

Attn: Mr. Michael Buchanan  
P 505-490-0798  
E Michael.buchanan@emnrd.nm.gov

RE: Additional Groundwater Delineation Work Plan  
Apache Corporation  
EBDU #37  
Case No. (1R-5636), Incident ID NDHR192214227  
Lea County, New Mexico  
Terracon Project No. KH247030

Dear Mr. Buchanan:

Terracon Consultants, Inc. (Terracon) and Apache Corporation (Apache) have prepared this work plan describing additional site investigation activities planned for the above-reference site. The scope of work is intended to provide additional information to delineate the extent of groundwater impacts and provide additional information on the hydraulic properties of the groundwater system.

Additional Monitoring Wells

Seven additional monitoring wells will be installed as described below:

- TMW-25 (32.475248°, -103.121412°) will provide downgradient delineation
- TMW-26 (32.477315°, -103.119178°) will provide downgradient and lateral delineation on the southeast edge of the plume
- TMW-27 (32.479989°, -103.120675°) will serve to confirm the chloride plume is continuous between the source (near TTMW-7) and TTMW-17, which has shown elevated chlorides in recent sampling. TMW-27 will be completed as a six-inch diameter well suitable for use as a recovery well if needed.
- TMW-28 (32.482492°, -103.121341°) and TMW-29 (32.481836°, -103.119511°) will provide upgradient delineation. These wells will be located approximately 750 feet (TMW-28) and 550 feet (TMW-29) upgradient of the source. The average of these two wells is intended to serve as representative background conditions.
- TMW-30 ( 32.477428°, -103.120114°) will be located approximately 200 feet southeast of TMW-18 to provide information on stratigraphy and groundwater chemistry in the space between current TMW-18, TMW-23, and proposed TMW-26. This is the location identified as TMW-39 from the OCD approval letter.
- TMW-31 (32.476425°, -103.119734°) will provide downgradient and lateral (southeast) delineation of the plume. This is the location identified as TMW-42 from the OCD approval letter.
- At each of the monitoring well locations soil samples will be collected at five-foot intervals and will be submitted to a laboratory for analyses for TPH, chloride, and BTEX by EPA Methods 8260, EPA Method 300 and EPA Method 8015.

Explore with us



Soil Borings

Four soil borings will be advanced to evaluate potential source areas for chlorides. Precise locations will be determined in consultation and agreement with NMOCD. Soil samples from the borings will be analyzed in the field using titration methods to aid in directing the field work. Borings will be advanced to a depth of 30’ and sampling will cease if no samples are found above RALs.

Groundwater Sampling

- Two groundwater sampling events for all wells and the windmill will be done in September and December. The September event will sample the existing monitoring wells and the windmill well. The December sampling event will include the newly installed seven wells as well as the existing monitoring wells and the windmill well.
- Samples from all wells will be analyzed for Chlorides and TDS
- Samples from the newly installed seven wells will also be analyzed for BTEX/TPH. If these parameters are below sample detection limits as they have been in all wells sampled to date, then future sampling events at these locations will be for chloride and TDS.
- Samples from the Windmill Well, TMW-5 and TMW-17 will be sampled for the human health standard constituents in the NM WQCC list in subsections A, B and C of 20.6.2.3103 NMAC.
- Samples from the Windmill Well, TMW-1, TMW-3, and TMW-21 will also be sampled for Barium
- Prior to the first sampling event, TMW-17 will be purged dry, to the maximum extent possible, to ensure water being sampled is formation water and not related to water introduced when the well was installed.

Aquifer Characterization

A pump test will be performed at TMW-27 to gauge the characteristics of the aquifer. The well will be pumped for 24-48 hours. Drawdown will be measured in the pumping well and select monitoring wells using pressure transducers. Evaluation of the data will provide information needed to evaluate the effectiveness and requirements for future remedial activities.

Field Methods

The monitoring wells will be installed using air rotary drilling techniques. Precise location, depth and screened intervals may be adjusted in the field based on site conditions and observed groundwater levels while drilling.

Monitoring Well	Anticipated Depth to Groundwater (feet bgs)	Approximate well Depth* (feet bgs)	Approximate Screened Interval (feet bgs)
TMW-25	60	80	60 - 80
TMW-26	60	80	60 – 80
TMW-27 (6” – Well)	55	95	75 – 95
TMW-28	55	75	55 – 75
TMW-29	60	80	60 – 80
TMW-30	60	80	60 – 80
TMW-31	60	80	60 – 80

Additional Groundwater Delineation Work Plan  
Apache EBDU#37 | Lea County, New Mexico  
September 23, 2024 | Terracon Project No. KH247030



All monitoring wells with the exception of TMW-27 (RW-1) will be constructed with 20 feet of 2-inch diameter, 0.010-inch machine-slotted polyvinyl chloride (PVC) well screen with a threaded bottom cap and 2-inch diameter, threaded, flush-joint PVC riser pipe to the surface. The annular space will be backfilled with pre-sieved 20/40-grade silica sand around the well screen from the bottom of the boring to approximately 2 feet above the top of the well screen. A minimum of 2 feet of hydrated bentonite pellets will be placed above the sand pack and cement/bentonite slurry to the surface. The wells will be completed with a 4-inch diameter above grade protective casing set in a concrete pad. The locations of the proposed monitoring wells are presented in the attached Exhibit 1. The new monitoring wells will be developed by surging and removing groundwater until fluids appear relatively free of fine-grained sediment.

TMW-27 will be completed using 6" diameter 0.035 continuous slot screen with 8/16 Brady Sand filter pack. We anticipate installing a 20' length screen as shown in the table above but will evaluate more carefully as we design the aquifer test.

Groundwater samples will be collected using HydraSleeve passive samplers. The samplers will be introduced one day, then samples will be retrieved the following day. The HydraSleeve will be set up to sample the lower 10 feet of each well.

#### Investigation-Derived Waste (IDW)

The proposed monitoring wells will be located in areas of the site removed from the spill; therefore, soils are not anticipated to be impacted. The soil cuttings generated during installation will be dispersed at the location of each respective proposed monitoring well. Groundwater collected during well development and from the purging and sampling process will be collected in a poly tank and left on-site until lab results are analyzed to determine a suitable alternative for disposition.

#### Schedule

The well installation and sampling event is scheduled to begin on the week of October 15, 2024 and anticipated to be completed October 25, 2024. However, initiation of the work is contingent on obtaining a drilling permit from the New Mexico Office of State Engineer. Should you have any questions regarding this work plan, please contact me at (612) 865-4899 or John.Grams@terracon.com.

Sincerely,  
Terracon

John Grams, P.G. (Texas)  
Project Hydrogeologist

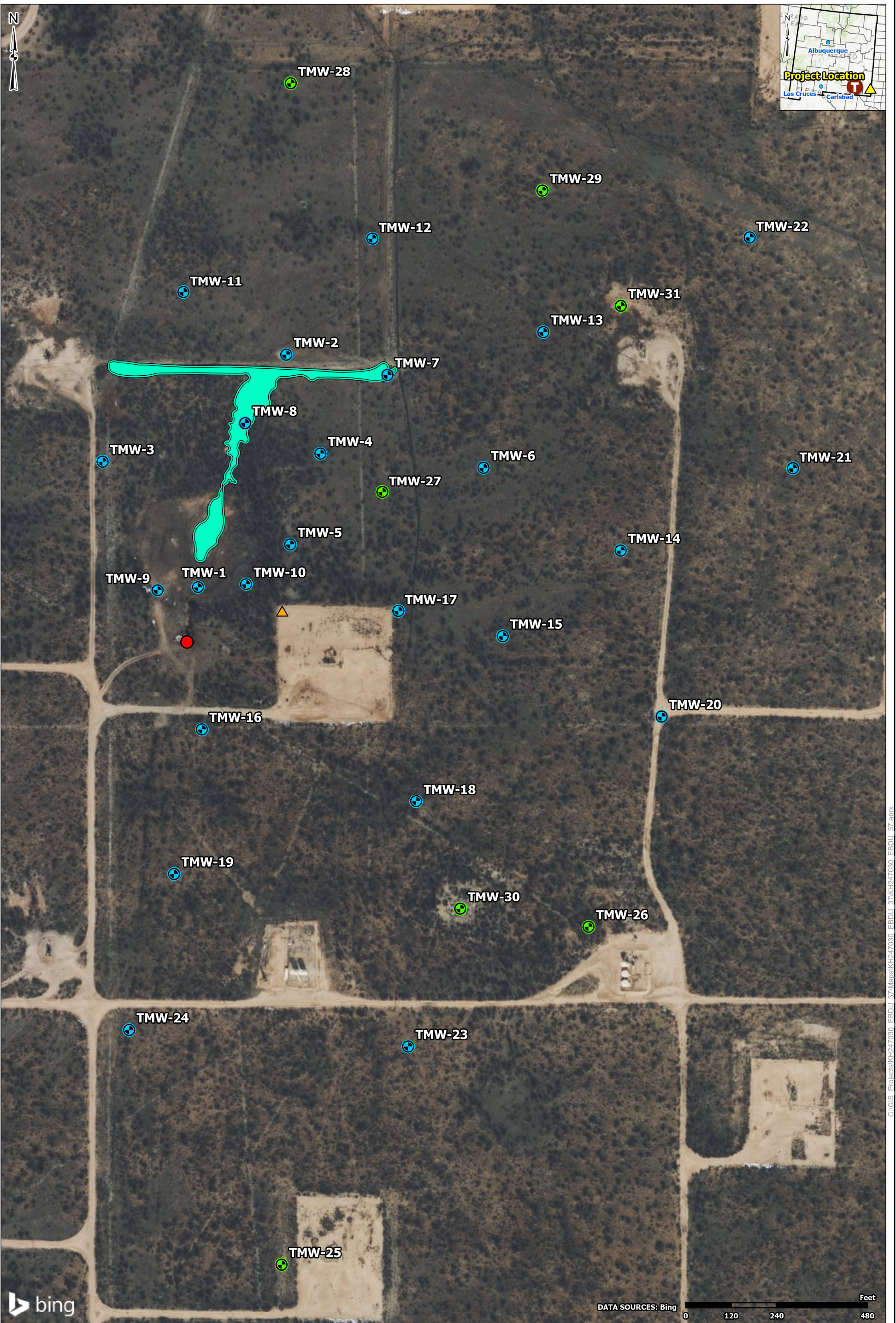
Joseph Guesnier  
Office Manager, Carlsbad, NM

cc: Barrett Bole, Apache Corp.

Attachment – Exhibit 1, Site Map



**EXHIBIT 1**  
**SITE MAP**



- Inferred Release
- Existing Monitoring Well
- Proposed Monitoring Well
- ▲ Static Control GPS
- Windmill

Project No.:  
KH247030  
Date:  
Sep 09 2024  
Drawn By:  
JWL  
Reviewed By:  
JRG

**Terracon**  
4526 W Pierce St  
Carlsbad, NM  
PH. 806-300-0140      terracon.com

**Well Location Map**  
EBDU 37  
32.4807053, -103.123085  
Apache Corporation  
Eunice, Lea County, New Mexico

**Exhibit**  
  
**1**

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