

**JAVELINA UNIT 601 (601H,  
602H, 603H, 501H, 502H)  
[fJMB2222150892]**

**C-144/ Permit Approval  
with Conditions**

**[4323] CHEVRON USA INC**

**August 9, 2022**

**Burdine, Jaclyn, EMNRD**

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**From:** Burdine, Jaclyn, EMNRD  
**Sent:** Tuesday, August 9, 2022 2:25 PM  
**To:** 'Vallejo, Tony'; 'jessicazemen@chevron.com'  
**Cc:** Enviro, OCD, EMNRD; 'cawq@chevron.com'; 'rachel.cruz@arcadis.com'  
**Subject:** RE: JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Approval with Conditions  
**Attachments:** JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] approval.pdf

I forgot to attach the approved copy. Sorry everyone, here you go!

**Jackie Burdine** • Environmental Specialist-Advanced – Administrative Permitting Program  
EMNRD - Oil Conservation Division  
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<http://www.emnrd.nm.gov/ocd>

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**From:** Burdine, Jaclyn, EMNRD  
**Sent:** Tuesday, August 9, 2022 2:24 PM  
**To:** Vallejo, Tony <jvallejo@chevron.com>; jessicazemen@chevron.com  
**Cc:** Enviro, OCD, EMNRD <OCD.Enviro@state.nm.us>; cawq@chevron.com; rachel.cruz@arcadis.com  
**Subject:** JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Approval with Conditions

**JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892]**  
**Temporary Pit non-low chloride fluids. Approval with Conditions.**

Good Afternoon Mr. Vallejo,

NMOCD has reviewed [4323] CHEVRON USA INC, Application and Form C-144 received on August 9, 2022, for the proposed JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892], Temporary Pit in Unit Letter D, Section 9, Township 24S, Range 31E, Eddy County, New Mexico.

[4323] CHEVRON USA INC in the Application requested the following two variances from the requirements of 19.15.17 NMAC – Pits, Closed-Loop Systems, Below-Grade Tanks and Sumps:

1. [4323] CHEVRON USA INC proposes a closure timeline based on the date of the first occurrence of Rig Down Move Out (RDMO). RDMO is defined as the activity when the drilling rig is moved off location. Typically, RDMO occurs after the completion of drilling the last well on the pad. On pads where the Operator plans to return to the pad, multiple RDMO dates occur. This variance does not consider subsequent RDMO affecting the closure timeline dates after the first RDMO. The Operator proposes dewatering the pit within 30 days of RDMO and proposes closing the pits within 1 year of RDMO.
2. [4323] CHEVRON USA INC proposes the use of 40-mil High-Density Polyethylene (HDPE) Liner for Temporary Pit in lieu of 20 mil string reinforced Linear Low-Density Polyethylene (LLDPE) Liner.

Subject to the conditions specified below, NMOCD approves the following variances:

1. The variance from 19.15.17.7.R NMAC, which requires that a pit be closed no later than six (6) months after removal of the drilling or workover rig from the first well using the pit.

2. The variance from 19.15.17.11.F.3 NMAC, which requires the pit to be equipped with a of 20- mil string reinforced LLDPE or equivalent liner material that the appropriate division district office approves.

[4323] CHEVRON USA INC shall comply with the following conditions of approval:

1. [4323] CHEVRON USA INC may use the Pit for five (5) wells drilled from the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892].
2. [4323] CHEVRON USA INC shall use the facility identification number [fJMB2222150892] in all communications with OCD regarding JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit.
3. [4323] CHEVRON USA INC shall design, construct, operate, maintain, and close JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit in compliance with 19.15.17 NMAC - Pits, Closed-Loop Systems, Below-Grade-Tanks and Sumps.
4. The design and construction plan, included as Appendix D of the Application, is approved. [4323] CHEVRON USA INC shall design and construct JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit as described in the approved plan. [4323] CHEVRON USA INC shall apply for a permit modification for any change to the plan.
5. The closure plan, included as Appendix F of the Application, is approved. [4323] CHEVRON USA INC shall close the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit as described in the approved plan. [4323] CHEVRON USA INC shall apply for a permit modification for any change to the plan.
6. Prior to commencing construction of the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit, [4323] CHEVRON USA INC shall submit to OCD a Form C-102, including a certified survey, as required by 19.15.17.9(C)(2) NMAC via [OCD Online](#).
7. [4323] CHEVRON USA INC shall inspect JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit at least once per month during construction for compliance with the approved design and construction plan. [4323] CHEVRON USA INC shall maintain a log of each inspection and provide a copy of the log through [OCD Online](#) for each quarter beginning fifteen days (15) after the end of the quarter during construction.
8. If [4323] CHEVRON USA INC encounters a void or collapse during construction, operation, maintenance, or closure of the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit, [4323] CHEVRON USA INC shall immediately cease the activity, notify OCD through [OCD Online](#), within twenty-four (24) hours, and take corrective action approved by OCD.
9. No later than seventy-two (72) hours prior to installing the 40-mil HDPE liner, [4323] CHEVRON USA INC shall notify the OCD through [OCD Online](#).
10. [4323] CHEVRON USA INC shall inspect JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit at least once per day for liner integrity, freeboard height, fluid level, debris, migratory birds and other wildlife, and releases while the drilling or workover rig is on location, and once per week after removal of the rig but prior to dewatering the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit. [4323] CHEVRON USA INC shall maintain a log of each inspection and provide a copy of the log through [OCD Online](#) for each quarter beginning fifteen days (15) after the end of the quarter during construction.
11. [4323] CHEVRON USA INC shall maintain no less than two (2) feet of freeboard at the Pit at all times.
12. [4323] CHEVRON USA INC shall construct and maintain a fence around the perimeter of the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit at all times after the completion of construction.

13. No later than thirty (30) days after the date of any of the following events, [4323] CHEVRON USA INC shall drain and dewater the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit:
- a. The release of the drilling or workover rig from the last well as reported to the OCD on Form C-105; or
  - b. The removal of the drilling or workover rig from the pad if the well is not completed; or
  - c. If the drilling or workover rig is located at the pad, one hundred eight one (181) days after the rig became inactive.
14. No later than six (6) months after the date of any of the following events, [4323] CHEVRON USA INC shall close JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892]:
- a. The release of the drilling or workover rig from the last well as reported to the OCD on Form C-105; or
  - b. The removal of the drilling or workover rig from the pad if the well is not completed; or
  - c. If the drilling or workover rig is located at the pad, one hundred eight one (181) days after the rig became inactive.
15. After [4323] CHEVRON USA INC drains and dewateres JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit, it shall inspect the Pit for liner integrity, fluid level, debris, migratory birds and other wildlife, and releases once per week until the installation of the top geomembrane cover and the placement of the cover soils in accordance with the closure plan.
16. [4323] CHEVRON USA INC shall maintain a log of each inspection and provide a copy of the log to OCD via [OCD Online](#) for each quarter beginning fifteen days (15) days after the end of the quarter in which the Pit is dewatered and drained. If [4323] CHEVRON USA INC observes fluid in the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit during an inspection, it shall notify OCD's Environmental Bureau at through [OCD Online](#), remove the fluid immediately, and submit a report characterizing the nature, volume, and source of the fluid via [OCD Online](#).
17. After [4323] CHEVRON USA INC has drained and dewatered the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] Pit, Chevron shall not discharge fluid into the Pit for any purpose except for an emergency as provided in 19.15.17.14 NMAC.
18. [4323] CHEVRON USA INC shall comply with 19.15.29 NMAC - Releases for any release related to or associated with the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892].
19. No later than seventy-two (72) hours prior to installing the top geomembrane cover and cover soil on the JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892], [4323] CHEVRON USA INC shall notify the OCD via [OCD Online](#).

This letter constitutes NMOCD's conditions of approval of the variances. Please reference JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892] in all future communications

Please let me know if you any additional questions or concerns.

**Jackie Burdine** • Environmental Specialist-Advanced – Administrative Permitting Program  
EMNRD - Oil Conservation Division  
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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-144  
Revised April 3, 2017

**For temporary pits, below-grade tanks, and multi-well fluid management pits**, submit to the appropriate NMOC District Office.  
**For permanent pits** submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOC District Office.

Pit, Below-Grade Tank, or  
Proposed Alternative Method Permit or Closure Plan Application

Type of action: ☐ Below grade tank registration  
☒ Permit of a pit or proposed alternative method  
☐ Closure of a pit, below-grade tank, or proposed alternative method  
☐ Modification to an existing permit/or registration  
☐ Closure plan only submitted for an existing permitted or non-permitted pit, below-grade tank, or proposed alternative method

**Instructions: Please submit one application (Form C-144) per individual pit, below-grade tank or alternative request**

Please be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.  
Operator: Chevron USA Inc. OGRID #: 4323  
Address: 6301 Deauville Blvd., Midland, TX 79706  
Facility or well name: Javelina Unit 601 (601H, 602H, 603H, 501H, 502H)  
API Number: Pending OCD Permit Number: Facility ID:[fJMB2222150892]  
U/L or Qtr/Qtr D Section 9 Township 24S Range 31E County: Eddy  
Center of Proposed Design: Latitude 32.23594 Longitude -103.78813 NAD83  
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.  
☒ **Pit:** Subsection F, G or J of 19.15.17.11 NMAC  
Temporary: ☒ Drilling ☐ Workover  
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A ☐ Multi-Well Fluid Management Low Chloride Drilling Fluid ☐ yes ☒ no  
☒ Lined ☐ Unlined Liner type: Thickness 40 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other \_\_\_\_\_  
☐ String-Reinforced  
Liner Seams: ☒ Welded ☐ Factory ☐ Other \_\_\_\_\_ Volume: 1 x 17,900 bbl, 1 x 10,800 bbl Dimensions: L 291 ft x W 196 ft x D 8 ft

3.  
☐ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC  
Volume: \_\_\_\_\_ bbl Type of fluid: \_\_\_\_\_  
Tank Construction material: \_\_\_\_\_  
☐ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off  
☐ Visible sidewalls and liner ☐ Visible sidewalls only ☐ Other \_\_\_\_\_  
Liner type: Thickness \_\_\_\_\_ mil ☐ HDPE ☐ PVC ☐ Other \_\_\_\_\_

4.  
☐ **Alternative Method:**  
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

5.  
**Fencing:** Subsection D of 19.15.17.11 NMAC (*Applies to permanent pits, temporary pits, and below-grade tanks*)  
☐ Chain link, six feet in height, two strands of barbed wire at top (*Required if located within 1000 feet of a permanent residence, school, hospital, institution or church*)  
☒ Four foot height, four strands of barbed wire evenly spaced between one and four feet  
☐ Alternate. Please specify \_\_\_\_\_

6.

**Netting:** Subsection E of 19.15.17.11 NMAC (*Applies to permanent pits and permanent open top tanks*)☐ Screen ☐ Netting ☐ Other \_\_\_\_\_☐ Monthly inspections (If netting or screening is not physically feasible)

7.

**Signs:** Subsection C of 19.15.17.11 NMAC☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers☒ Signed in compliance with 19.15.16.8 NMAC

8.

**Variations and Exceptions:**

Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.

***Please check a box if one or more of the following is requested, if not leave blank:***☒ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. **See Variance Requests**☐ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

9.

**Siting Criteria (regarding permitting):** 19.15.17.10 NMAC***Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below. Siting criteria does not apply to drying pads or above-grade tanks.*****General siting****Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank.**- ☐ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells☐ Yes ☐ No☒ NA**Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit.**- ☒ NM Office of the State Engineer - iWATERS database search; ☒ USGS; ☐ Data obtained from nearby wells☐ Yes ☒ No☐ NA**See Appendices A, B, Figure 7**Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- Written confirmation or verification from the municipality; Written approval obtained from the municipality

**See Figures 2 & 7**Within the area overlying a subsurface mine. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division

**See Figure 4**Within an unstable area. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- Engineering measures incorporated into the design; NM Bureau of Geology &amp; Mineral Resources; USGS; NM Geological Society; Topographic map

**See Figures 6, 8, 9, Appendix G**Within a 100-year floodplain. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- FEMA map

**See Figure 3****Below Grade Tanks**

Within 100 feet of a continuously flowing watercourse, significant watercourse, lakebed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark).

☐ Yes ☐ No

- Topographic map; Visual inspection (certification) of the proposed site

Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;

☐ Yes ☐ No

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

**Temporary Pit using Low Chloride Drilling Fluid** (maximum chloride content 15,000 mg/liter)

Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.)

☐ Yes ☐ No

- Topographic map; Visual inspection (certification) of the proposed site

Within 300 feet from a occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application.

☐ Yes ☐ No

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

Within 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300 feet of any other fresh water well or spring, in existence at the time of the initial application.  
NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 100 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

### **Temporary Pit Non-low chloride drilling fluid**

Within 300 feet of a continuously flowing watercourse, or any other significant watercourse, or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

**See Figure 6**

☐ Yes ☒ No

Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

**See Figure 2**

☐ Yes ☒ No

Within 500 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 1000 feet of any other fresh water well or spring, in the existence at the time of the initial application;

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

**See Appendices A, B, and Figures 1 & 2**

☐ Yes ☒ No

Within 300 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

**See Figures 2, 5, & 6**

☐ Yes ☒ No

### **Permanent Pit or Multi-Well Fluid Management Pit**

Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

☐ Yes ☐ No

Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 500 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

10.

#### **Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
- ☒ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC
- See Appendix C**
- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC **Attached**
- ☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC **See Appendix D**
- ☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC **See Appendix E**
- ☒ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC **See Appendix F**

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_ or Permit Number: \_\_\_\_\_

11.

#### **Multi-Well Fluid Management Pit Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ A List of wells with approved application for permit to drill associated with the pit.
- ☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
- ☐ Hydrogeologic Data - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_ or Permit Number: \_\_\_\_\_

12.  
**Permanent Pits Permit Application Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC  
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC  
☐ Climatological Factors Assessment  
☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Quality Control/Quality Assurance Construction and Installation Plan  
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC  
☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Nuisance or Hazardous Odors, including H<sub>2</sub>S, Prevention Plan  
☐ Emergency Response Plan  
☐ Oil Field Waste Stream Characterization  
☐ Monitoring and Inspection Plan  
☐ Erosion Control Plan  
☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

13.  
**Proposed Closure:** 19.15.17.13 NMAC **See Appendix F**

**Instructions:** Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

Type: ☒ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☐ Below-grade Tank ☐ Multi-well Fluid Management Pit  
☐ Alternative

Proposed Closure Method: ☐ Waste Excavation and Removal  
☐ Waste Removal (Closed-loop systems only)  
☒ On-site Closure Method (Only for temporary pits and closed-loop systems)  
☒ In-place Burial ☐ On-site Trench Burial  
☐ Alternative Closure Method

14.  
**Waste Excavation and Removal Closure Plan Checklist:** (19.15.17.13 NMAC) **Instructions:** Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC  
☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.13 NMAC  
☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)  
☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

15.  
**Siting Criteria (regarding on-site closure methods only):** 19.15.17.10 NMAC

**Instructions:** Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. Please refer to 19.15.17.10 NMAC for guidance.

Ground water is less than 25 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells <b>See Appendices A &amp; B, and Figure 7</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Ground water is between 25-50 feet below the bottom of the buried waste - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells <b>See Appendices A &amp; B, and Figure 7</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Ground water is more than 100 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells <b>See Appendices A &amp; B, and Figure 7</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site <b>See Figure 6</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image <b>See Figure 2</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 horizontal feet of a private, domestic fresh water well or spring used for domestic or stock watering purposes, in existence at the time of initial application.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

<ul style="list-style-type: none"> <li>- NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site <b>See Appendices A &amp; B, and Figure 7</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Written confirmation or verification from the municipality; Written approval obtained from the municipality	
Within 300 feet of a wetland.	
US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site <b>See Figures 2, 5 &amp; 6</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>- Written confirmation or verification from the municipality; Written approval obtained from the municipality <b>See Figure 2</b></li> </ul>	
Within the area overlying a subsurface mine.	
<ul style="list-style-type: none"> <li>- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division <b>See Figure 4</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within an unstable area.	
<ul style="list-style-type: none"> <li>- Engineering measures incorporated into the design; NM Bureau of Geology &amp; Mineral Resources; USGS; NM Geological Society; Topographic map <b>See Figures 6, 8, &amp; 9, Appendix G</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain.	
<ul style="list-style-type: none"> <li>- FEMA map <b>See Figure 3</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

16.  
**On-Site Closure Plan Checklist:** (19.15.17.13 NMAC) *Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.*

- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC **Attached**
- ☒ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC
- ☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of Subsection K of 19.15.17.11 NMAC
- ☒ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC  
**See Appendix D**
- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Waste Material Sampling Plan - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved)  
**See Appendix F**
- ☒ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**

17.  
**Operator Application Certification:**

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Tony Vallejo Title: Sr. Workforce Safety & Environmental Specialist - Factory

Signature: Tony Vallejo Date: 7/27/2022

e-mail address: jvallejo@chevron.com Telephone: O: 432-687-7524 or C: 325-450-1413

18.  
**OCD Approval:** ☒ Permit Application (including closure plan) ☐ Closure Plan (only) ☐ OCD Conditions (see attachment)

OCD Representative Signature: Jaclyn Burdine Approval Date: 08/09/2022

Title: Environmental Specialist-A OCD Permit Number: Facility ID: [fJMB2222150892]

19.  
**Closure Report (required within 60 days of closure completion):** 19.15.17.13 NMAC

*Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.*

☐ Closure Completion Date: \_\_\_\_\_

20.  
**Closure Method:**

- ☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)
- ☐ If different from approved plan, please explain.

21.

**Closure Report Attachment Checklist:** *Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.*

- ☐ Proof of Closure Notice (surface owner and division)
- ☐ Proof of Deed Notice (required for on-site closure for private land only)
- ☐ Plot Plan (for on-site closures and temporary pits)
- ☐ Confirmation Sampling Analytical Results (if applicable)
- ☐ Waste Material Sampling Analytical Results (required for on-site closure)
- ☐ Disposal Facility Name and Permit Number
- ☐ Soil Backfilling and Cover Installation
- ☐ Re-vegetation Application Rates and Seeding Technique
- ☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude \_\_\_\_\_ Longitude \_\_\_\_\_ NAD: ☐ 1927 ☐ 1983

22.

**Operator Closure Certification:**

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

e-mail address: \_\_\_\_\_ Telephone: \_\_\_\_\_





July 27, 2022

New Mexico Oil Conservation Division  
811 S. First St.  
Artesia, NM 88210

Via Electronic Submittal

**RE: Chevron USA Incorporated Temporary Pit Application**

Javelina Unit 601 (601H, 602H, 603H, 501H, 502H)  
Section 9 of T24S, R31E, Eddy County

Ms. Victoria Venegas,

Enclosed is a complete C-144 permit application for a Temporary Pit with non-low chloride drilling fluid located at an existing Chevron USA Inc. BLM lease #USA NMNM 063757 located in Section 9, T24S R31E. This package includes the following documentation:

- C-144 for Non-Low Chloride Temporary Pit
- Siting Criteria Demonstration
- Siting Criteria Figures 1-11
- Variance Requests
- Appendix A – USGS Groundwater Data
- Appendix B – NMOSE Water Data
- Appendix C – Hydrogeologic Data
- Appendix D – Design Plan
- Appendix E – Operating and Maintenance Plan
- Appendix F – Closure Plan
- Appendix G – Evaluation of Unstable Conditions
- Attachments 1 - 3

Please do not hesitate to contact us if you require any additional information or clarification supporting the approval of this application.

Sincerely,

Tony Vallejo  
Sr. Workforce Safety &  
Environmental Specialist – Factory  
[jvallejo@chevron.com](mailto:jvallejo@chevron.com)

Chinedu Akwukwaegbu  
Wells Engineer  
[cawq@chevron.com](mailto:cawq@chevron.com)

Rachel Cruz  
Project Manager (Arcadis U.S., Inc.)  
[rachel.cruz@arcadis.com](mailto:rachel.cruz@arcadis.com)

**Chevron USA Incorporated**  
Chevron USA Inc.  
6301 Deauville Blvd  
Midland, TX 79706  
Tel 432 687 7524



**C-144 Permit Package  
Javelina Unit 601, Temporary Pit  
Section 9 of T24S, R31E, Eddy County**

Javelina Unit / 601H

Javelina Unit / 602H

Javelina Unit / 603H

Javelina Unit / 501H

Javelina Unit / 502H

Chevron USA Incorporated  
6301 Deauville Blvd.  
Midland, TX 79706  
(432) 687-7524

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-144  
Revised April 3, 2017

**For temporary pits, below-grade tanks, and multi-well fluid management pits**, submit to the appropriate NMOC District Office.  
**For permanent pits** submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOC District Office.

Pit, Below-Grade Tank, or  
Proposed Alternative Method Permit or Closure Plan Application

Type of action: ☐ Below grade tank registration  
☒ Permit of a pit or proposed alternative method  
☐ Closure of a pit, below-grade tank, or proposed alternative method  
☐ Modification to an existing permit/or registration  
☐ Closure plan only submitted for an existing permitted or non-permitted pit, below-grade tank, or proposed alternative method

**Instructions: Please submit one application (Form C-144) per individual pit, below-grade tank or alternative request**

Please be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.  
Operator: Chevron USA Inc. OGRID #: 4323  
Address: 6301 Deauville Blvd., Midland, TX 79706  
Facility or well name: Javelina Unit 601 (601H, 602H, 603H, 501H, 502H)  
API Number: Pending OCD Permit Number: Facility ID:[fJMB2222150892]  
U/L or Qtr/Qtr D Section 9 Township 24S Range 31E County: Eddy  
Center of Proposed Design: Latitude 32.23594 Longitude -103.78813 NAD83  
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.  
☒ **Pit:** Subsection F, G or J of 19.15.17.11 NMAC  
Temporary: ☒ Drilling ☐ Workover  
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A ☐ Multi-Well Fluid Management Low Chloride Drilling Fluid ☐ yes ☒ no  
☒ Lined ☐ Unlined Liner type: Thickness 40 mil ☐ LLDPE ☒ HDPE ☐ PVC ☐ Other \_\_\_\_\_  
☐ String-Reinforced  
Liner Seams: ☒ Welded ☐ Factory ☐ Other \_\_\_\_\_ Volume: 1 x 17,900 bbl, 1 x 10,800 bbl Dimensions: L 291 ft x W 196 ft x D 8 ft

3.  
☐ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC  
Volume: \_\_\_\_\_ bbl Type of fluid: \_\_\_\_\_  
Tank Construction material: \_\_\_\_\_  
☐ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off  
☐ Visible sidewalls and liner ☐ Visible sidewalls only ☐ Other \_\_\_\_\_  
Liner type: Thickness \_\_\_\_\_ mil ☐ HDPE ☐ PVC ☐ Other \_\_\_\_\_

4.  
☐ **Alternative Method:**  
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

5.  
**Fencing:** Subsection D of 19.15.17.11 NMAC (*Applies to permanent pits, temporary pits, and below-grade tanks*)  
☐ Chain link, six feet in height, two strands of barbed wire at top (*Required if located within 1000 feet of a permanent residence, school, hospital, institution or church*)  
☒ Four foot height, four strands of barbed wire evenly spaced between one and four feet  
☐ Alternate. Please specify \_\_\_\_\_

6.

**Netting:** Subsection E of 19.15.17.11 NMAC (*Applies to permanent pits and permanent open top tanks*)☐ Screen ☐ Netting ☐ Other \_\_\_\_\_☐ Monthly inspections (If netting or screening is not physically feasible)

7.

**Signs:** Subsection C of 19.15.17.11 NMAC☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers☒ Signed in compliance with 19.15.16.8 NMAC

8.

**Variations and Exceptions:**

Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.

***Please check a box if one or more of the following is requested, if not leave blank:***☒ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval. **See Variance Requests**☐ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

9.

**Siting Criteria (regarding permitting):** 19.15.17.10 NMAC***Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below. Siting criteria does not apply to drying pads or above-grade tanks.*****General siting****Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank.**- ☐ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells☐ Yes ☐ No☒ NA**Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit.**- ☒ NM Office of the State Engineer - iWATERS database search; ☒ USGS; ☐ Data obtained from nearby wells☐ Yes ☒ No☐ NA**See Appendices A, B, Figure 7**Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- Written confirmation or verification from the municipality; Written approval obtained from the municipality

**See Figures 2 & 7**Within the area overlying a subsurface mine. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division

**See Figure 4**Within an unstable area. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- Engineering measures incorporated into the design; NM Bureau of Geology &amp; Mineral Resources; USGS; NM Geological Society; Topographic map

**See Figures 6, 8, 9, Appendix G**Within a 100-year floodplain. **(Does not apply to below grade tanks)**☐ Yes ☒ No

- FEMA map

**See Figure 3****Below Grade Tanks**

Within 100 feet of a continuously flowing watercourse, significant watercourse, lakebed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark).

☐ Yes ☐ No

- Topographic map; Visual inspection (certification) of the proposed site

Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;

☐ Yes ☐ No

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

**Temporary Pit using Low Chloride Drilling Fluid** (maximum chloride content 15,000 mg/liter)

Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.)

☐ Yes ☐ No

- Topographic map; Visual inspection (certification) of the proposed site

Within 300 feet from a occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application.

☐ Yes ☐ No

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

Within 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300 feet of any other fresh water well or spring, in existence at the time of the initial application.  
NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 100 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

### **Temporary Pit Non-low chloride drilling fluid**

Within 300 feet of a continuously flowing watercourse, or any other significant watercourse, or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

**See Figure 6**

☐ Yes ☒ No

Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

**See Figure 2**

☐ Yes ☒ No

Within 500 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 1000 feet of any other fresh water well or spring, in the existence at the time of the initial application;

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

**See Appendices A, B, and Figures 1 & 2**

☐ Yes ☒ No

Within 300 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

**See Figures 2, 5, & 6**

☐ Yes ☒ No

### **Permanent Pit or Multi-Well Fluid Management Pit**

Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

☐ Yes ☐ No

Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 500 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

10.

#### **Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

☐ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC

☒ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC

**See Appendix C**

☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC **Attached**

☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC **See Appendix D**

☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC **See Appendix E**

☒ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC **See Appendix F**

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_ or Permit Number: \_\_\_\_\_

11.

#### **Multi-Well Fluid Management Pit Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC

☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC

☐ A List of wells with approved application for permit to drill associated with the pit.

☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Hydrogeologic Data - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC

☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_ or Permit Number: \_\_\_\_\_

12. **Permanent Pits Permit Application Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC  
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC  
☐ Climatological Factors Assessment  
☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Quality Control/Quality Assurance Construction and Installation Plan  
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC  
☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Nuisance or Hazardous Odors, including H<sub>2</sub>S, Prevention Plan  
☐ Emergency Response Plan  
☐ Oil Field Waste Stream Characterization  
☐ Monitoring and Inspection Plan  
☐ Erosion Control Plan  
☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

13. **Proposed Closure:** 19.15.17.13 NMAC **See Appendix F**

**Instructions:** Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

- Type: ☒ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☐ Below-grade Tank ☐ Multi-well Fluid Management Pit  
☐ Alternative
- Proposed Closure Method: ☐ Waste Excavation and Removal  
☐ Waste Removal (Closed-loop systems only)  
☒ On-site Closure Method (Only for temporary pits and closed-loop systems)  
☒ In-place Burial ☐ On-site Trench Burial  
☐ Alternative Closure Method

14. **Waste Excavation and Removal Closure Plan Checklist:** (19.15.17.13 NMAC) **Instructions:** Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC  
☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.13 NMAC  
☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)  
☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

15. **Siting Criteria (regarding on-site closure methods only):** 19.15.17.10 NMAC

**Instructions:** Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. Please refer to 19.15.17.10 NMAC for guidance.

- |   |  |
|---|--|
| Ground water is less than 25 feet below the bottom of the buried waste.<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells<br><b>See Appendices A &amp; B, and Figure 7</b>  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br><input type="checkbox"/> NA |
| Ground water is between 25-50 feet below the bottom of the buried waste<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells<br><b>See Appendices A &amp; B, and Figure 7</b>  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br><input type="checkbox"/> NA |
| Ground water is more than 100 feet below the bottom of the buried waste.<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells<br><b>See Appendices A &amp; B, and Figure 7</b>   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><input type="checkbox"/> NA |
| Within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).<br>- Topographic map; Visual inspection (certification) of the proposed site<br><b>See Figure 6</b> | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |
| Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image<br><b>See Figure 2</b>                                     | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |
| Within 300 horizontal feet of a private, domestic fresh water well or spring used for domestic or stock watering purposes, in existence at the time of initial application.   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |

<ul style="list-style-type: none"> <li>- NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site <b>See Appendices A &amp; B, and Figure 7</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Written confirmation or verification from the municipality; Written approval obtained from the municipality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet of a wetland.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site <b>See Figures 2, 5 &amp; 6</b>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>- Written confirmation or verification from the municipality; Written approval obtained from the municipality <b>See Figure 2</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within the area overlying a subsurface mine.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division <b>See Figure 4</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within an unstable area.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>- Engineering measures incorporated into the design; NM Bureau of Geology &amp; Mineral Resources; USGS; NM Geological Society; Topographic map <b>See Figures 6, 8, &amp; 9, Appendix G</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<ul style="list-style-type: none"> <li>- FEMA map <b>See Figure 3</b></li> </ul>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

16.

**On-Site Closure Plan Checklist:** (19.15.17.13 NMAC) *Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.*

- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC **Attached**
- ☒ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC
- ☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of Subsection K of 19.15.17.11 NMAC
- ☒ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC  
**See Appendix D**
- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Waste Material Sampling Plan - based upon the appropriate requirements of 19.15.17.13 NMAC **See Appendix F**
- ☒ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved)  
**See Appendix F**
- ☒ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC **See Appendix F**

17.

**Operator Application Certification:**

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Tony Vallejo Title: Sr. Workforce Safety & Environmental Specialist - Factory

Signature: Tony Vallejo Date: 7/27/2022

e-mail address: jvallejo@chevron.com Telephone: O: 432-687-7524 or C: 325-450-1413

18.

**OCD Approval:** ☒ Permit Application (including closure plan) ☐ Closure Plan (only) ☐ OCD Conditions (see attachment)

OCD Representative Signature: Jaclyn Burdine Approval Date: 08/09/2022

Title: Environmental Specialist-A OCD Permit Number: Facility ID: [fJMB2222150892]

19.

**Closure Report (required within 60 days of closure completion):** 19.15.17.13 NMAC

*Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.*

☐ Closure Completion Date: \_\_\_\_\_

20.

**Closure Method:**

- ☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)
- ☐ If different from approved plan, please explain.

21.

**Closure Report Attachment Checklist:** *Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.*

- ☐ Proof of Closure Notice (surface owner and division)
- ☐ Proof of Deed Notice (required for on-site closure for private land only)
- ☐ Plot Plan (for on-site closures and temporary pits)
- ☐ Confirmation Sampling Analytical Results (if applicable)
- ☐ Waste Material Sampling Analytical Results (required for on-site closure)
- ☐ Disposal Facility Name and Permit Number
- ☐ Soil Backfilling and Cover Installation
- ☐ Re-vegetation Application Rates and Seeding Technique
- ☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude \_\_\_\_\_ Longitude \_\_\_\_\_ NAD: ☐ 1927 ☐ 1983

22.

**Operator Closure Certification:**

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

e-mail address: \_\_\_\_\_ Telephone: \_\_\_\_\_



**Siting Criteria Demonstration (19.15.17.10)**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

### **Depth to Groundwater, 19.15.17.10.3(a)**

**Figure 7, Appendices A & B**, and the discussion presented below demonstrate that the groundwater within the broader area of the proposed site ranges from approximately 66 to 868 feet near the proposed temporary pit.

**Figure 7** depicts the location of the pit relative to the locations of water wells within 5 miles of the pit for which water level data are available. Depth to water for the most recent, reliable measurement and the well identification number are shown adjacent to each well on **Figure 7**. The approximate boundary of the Pecos River Basin alluvial aquifer is located approximately 3.1 miles to the southwest of the Temporary Pit (**Figure 7**). Water well data, including gauging dates, are detailed in **Appendix A** (USGS) and **Appendix B** (NMOSE). Six water wells located within 5 miles of the temporary pit were gauged by USGS at 66 ft or more bgs.

- The nearest USGS-gauged water well to the pit location is located approximately 1.6 miles to the southwest and is likely completed in the Triassic Dockum Formation. In 2012, the water level was gauged at a depth of 74.4' bgs as reported in the USGS database.
- Also to southwest, a USGS-gauged water well is located approximately 2.6 miles from the proposed pit location and is completed in the Rustler Formation. In 1961, the water level was gauged at a depth of 367' bgs as reported in the USGS database.
- Farther to the southwest, a USGS-gauged water well is located approximately 4.6 miles from the proposed pit location and is completed in the Rustler Formation. In 1959, the water level was gauged at a depth of 423' bgs as reported in the USGS database.
- To the south, a USGS-gauged well is located approximately 4.0 miles away and is completed in the Rustler Formation. Water level was gauged at 740' bgs as reported in the USGS database.
- To the northeast, the nearest well is located approximately 2.85 miles away and is likely completed in the Alluvium and / or the Triassic Dockum. A water level of 100' bgs in 2012 is reported in the USGS database for this well.
- Another USGS-gauged well is located approximately 3.3 miles north-northwest of the proposed pit location. This well is reportedly completed in the Dewey Lake Redbeds but is likely completed in the Triassic Dockum and a water level of 139.9' bgs in 1972 was reported for this well in the USGS database.

Six water wells located within 5 miles of the temporary pit were gauged by NMOSE with reported water levels greater than 205 ft bgs.

- The nearest NMOSE water well to the pit location is located approximately 2 miles to the east-northeast and is likely completed in the Triassic Dockum Formation. A water level of 160' bgs was reported by the NMOSE for this well.
- Also to the east-northeast at a distance of approximately 2 miles, another water NMOSE-gauged water well is completed in the Triassic Dockum Formation. A water level of 205' bgs is reported in the NMOSE database.
- Farther to the northeast, an NMOSE well is located 3.8 miles away and appears to be completed in the Triassic Dockum Formation. Water level was reported at 430' bgs in the NMOSE database.
- A Triassic Dockum well is located approximately 4.0 miles southwest of the temporary pit with a reported water level of 400 feet in the NMOSE database.
- To the southeast, a NMOSE-gauged well is located approximately 2.8 miles away and appears to be completed in the Rustler Formation. A water level of 850' bgs is reported in the NMOSE database for this well.
- Another NMOSE well is shown approximately 2.8 miles southeast of the proposed pit location. This well appears to be completed in the Rustler Formation. A water level of 868 ft bgs is reported in the NMOSE database for this well.
- Other NMOSE database wells are located within 5 miles of the temporary pit but no water level data are reported.

The proposed temporary pit area and vicinity are underlain by recent eolian deposits consisting of drift sand a few feet in thickness and local occurrences of sand dunes (**Figure 9**). The eolian deposits are underlain by Pleistocene to recent alluvial deposits consisting of unconsolidated to partially consolidated sand, silt, gravel, clay and caliche. (Arcadis 2020). Alluvium thickness in this area appears to be approximately 100 feet or less. Triassic Dockum strata underlie the alluvium deposits and its thickness appears to be approximately 400 to 500 feet. The Dockum Group has been divided into three formations: lower red shale, siltstone, and very fine-grained sandstone called the Tecovas Formation (or Pierce Canyon redbeds); middle reddish-brown and gray sandstone called the Santa Rosa sandstone; and upper brick-red to maroon and purple shale with thin beds of fine red or gray sandstone and siltstone called the Chinle Formation.

A 2018 Geotechnical report was prepared based on five soil boring logs drilled in Section 11, approximately 2-miles southeast of the proposed temporary pit location (**Attachment 2**). Groundwater was not encountered in these borings.

### **Proximity to Surface Water, 19.15.17.10.3(b)**

**Figure 6** visualizes USGS contour lines and the USGS National Hydrography Dataset (NHD). The map demonstrates that the location is not within 1,000 feet of a continuously flowing waterway course, any other significant watercourse or lakebed, sinkhole, or playa lake.

- The nearest surface water feature (Pecos River) is approximately 11.5 miles west of the pit location.

- There are NHD features (ephemeral) approximately 1.5 miles west of the pit location.

**Proximity to Occupied Residences, Schools, Hospitals, Institutions or Churches, 19.15.17.10.3(c)**

The ESRI aerial imagery in **Figure 2** demonstrates that the location is not within 300 feet of occupied residences, schools, hospitals, institutions, or churches.

- There are no structures within 1,000 feet of the pit location.

**Proximity to springs and/or Domestic Freshwater Wells 19.15.17.10.3(d)**

No springs or domestic freshwater wells have been mapped within 300 ft of the pit locations.

**Proximity to Incorporated Municipal Boundaries and Fresh Water Well Fields 19.15.17.10.3(e)**

**Figure 1** demonstrates that the location is not within incorporated municipal boundaries or defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is the city of Malaga, approximately 16.5 miles to the west.

**Proximity to Wetlands, 19.15.17.10.3(f)**

Utilizing USFWS wetland data, **Figure 5** demonstrates that the proposed location is not located within 300 feet of a wetland.

**Proximity to Subsurface Mines, 19.15.17.10.3(g)**

Analysis of aerial imagery in the vicinity of the proposed temporary pit show that the nearest mines are all surficial caliche pits. There are no subsurface mines in the area as indicated in **Figure 4**.

**Proximity to Unstable Area, 19.15.17.10.3(h)**

**Figure 8** identifies the location of the proposed temporary pit with respect to Bureau of Land Management (BLM) mapped potential karst areas. The proposed Temporary Pit is mapped in a "Low Potential" karst area. The area lies near the northeast margin of the Delaware Basin. Bedrock cropping out beneath the proposed project area is comprised of the Triassic-aged Dockum Group. Underlying the Dockum Group are the Dewey Lake redbeds. Both of these formations are composed chiefly of clastic (insoluble), non-karst-forming rocks. Beneath these formations are Permian-aged rocks of the Rustler and Salado Formations. These rocks contain significant beds of halite (i.e., rock salt) and anhydrite, making them susceptible to karst formation. The top of the Rustler Formation

in the proposed project area is approximately 800 feet below the land surface (Crowl et al. 2011<sup>1</sup>). Therefore, local karst potential is likely to be low. An Evaluation of Unstable Conditions is presented in Appendix G that details several lines of evidence in support of this position. In summary:

1. There are no dissolution features within 5-miles of the proposed location (**Figure 11**),
2. Karst forming strata are over ~1,000-feet deep beneath the proposed location (**Appendix G - Figure G.1**),
3. An Arcadis field survey of the area indicated no karst features were identified (**Attachment 1**),
4. Tetra Tech geotechnical report and boring log from the proposed two recycled water storage ponds site location did not indicate any karst potential (**Attachment 2**),
5. The Bureau of Land Management, Carlsbad Field Office prepared the Environmental Assessment (EA), document number - DOI-BLM-NM-2020-0972-EA, evaluating MarkWest Energy West Texas Gas Col., LLC. This EA did not identify karst as an issue that needed evaluation (**Attachment 3**).

In the unlikely event that a void occurs during construction or operation activities, all activities must stop immediately, and the BLM should then be contacted within 24 hours to devise the best management plan to protect the environment and human safety.

#### **Proximity to Floodplains, 19.15.17.10.3(i)**

The location is within an area that has not yet been mapped by the Federal Emergency Management Agency (FEMA) with respect to the Flood Insurance Rate 100-Year Floodplain (**Figure 3**). In lieu of FEMA data, **Figure 10** visualizes the USDA – SSURGO Soils data for dominant flooding frequency condition. The Berino complex (BB) is not mapped as an area with any indication of flooding.

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<sup>1</sup> Crowl, W. J., D. E. Hulse, and G. Tucker, P.E., 2011. NI 43-101 Technical Report Prefeasibility Study for the Ochoa Project, Lea County, New Mexico. Prepared for IC Potash Corporation by Gustavsen and Associates, December 30, 2011, 301 p.

**Site Specific Information, Figures 1-11**

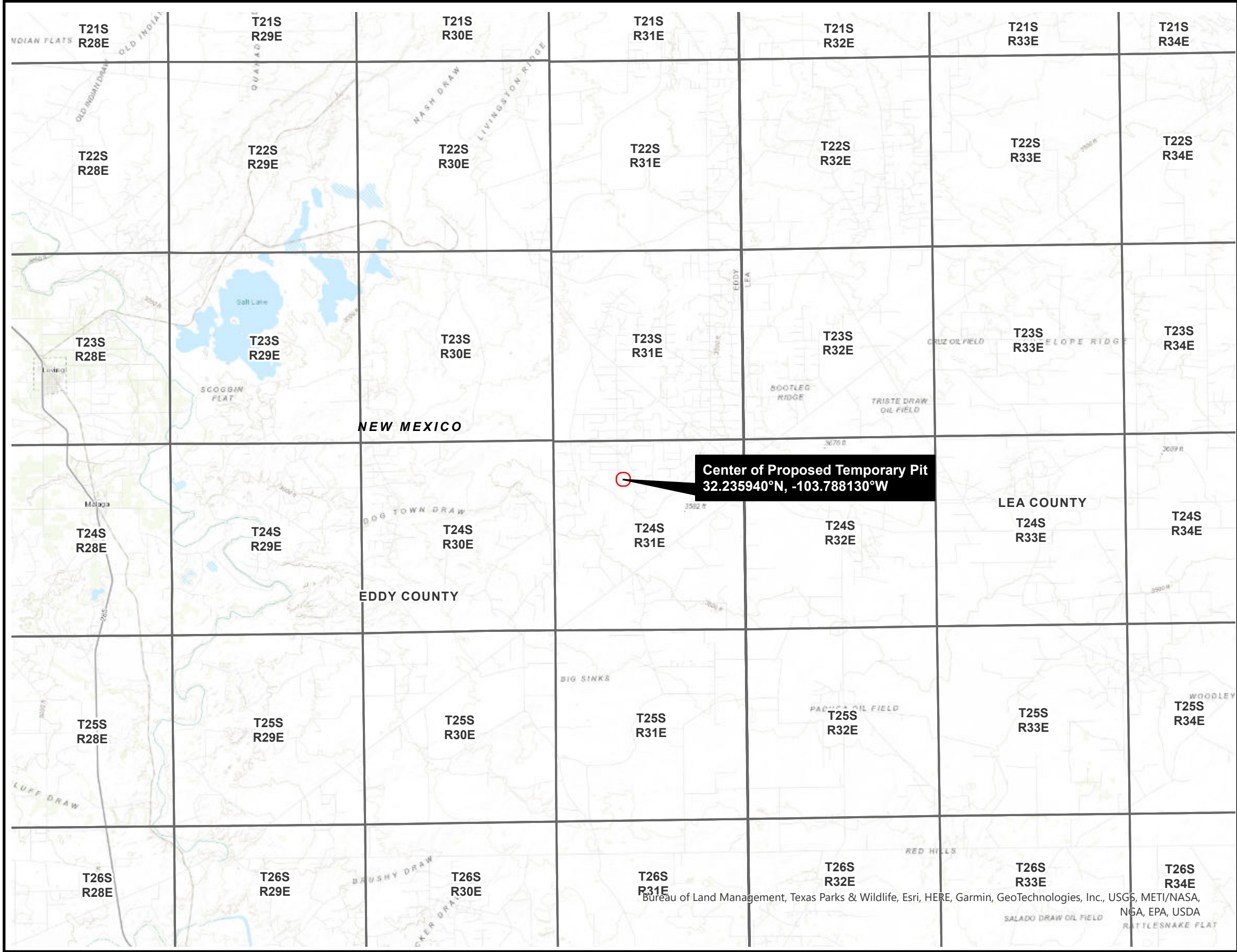
Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

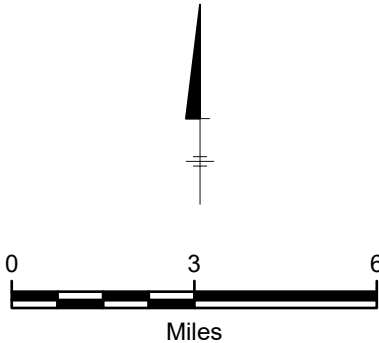


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LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer
- Townships



CHEVRON U.S.A. INC.  
EDDY COUNTY, NEW MEXICO

SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

VICINITY MAP



FIGURE  
1

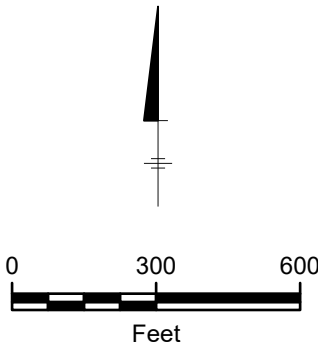


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**LEGEND**

-  Proposed Temporary Pit
-  1,000 ft Buffer



CHEVRON U.S.A. INC.  
EDDY COUNTY, NEW MEXICO  
SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

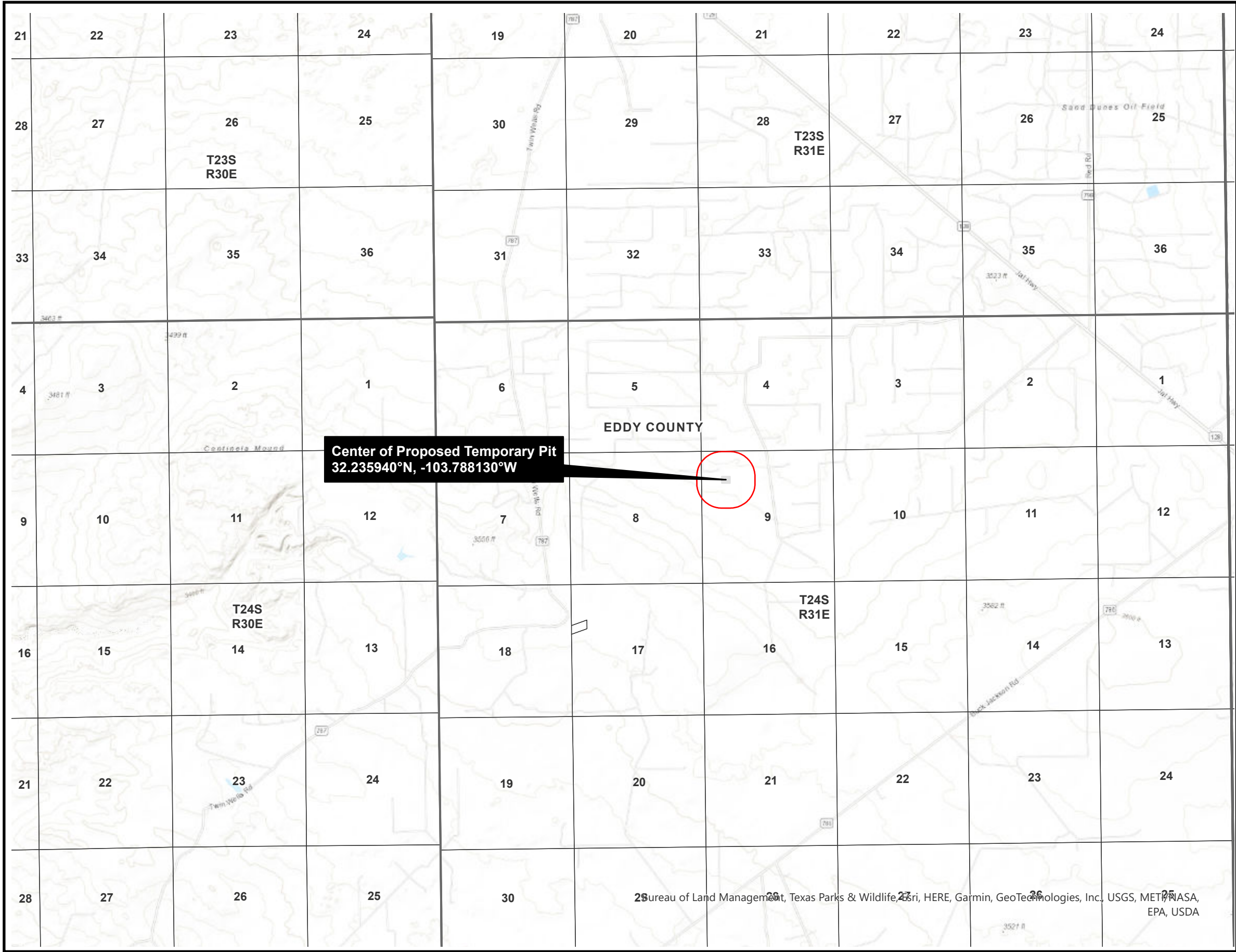
**SITE OVERVIEW**



FIGURE  
**2**



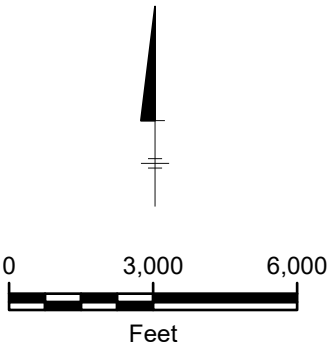
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LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer
- Townships
- Sections

NOTE:  
1. FLOODPLAIN DATA IS NOT AVAILAIBLE IN THIS MAP EXTENT.

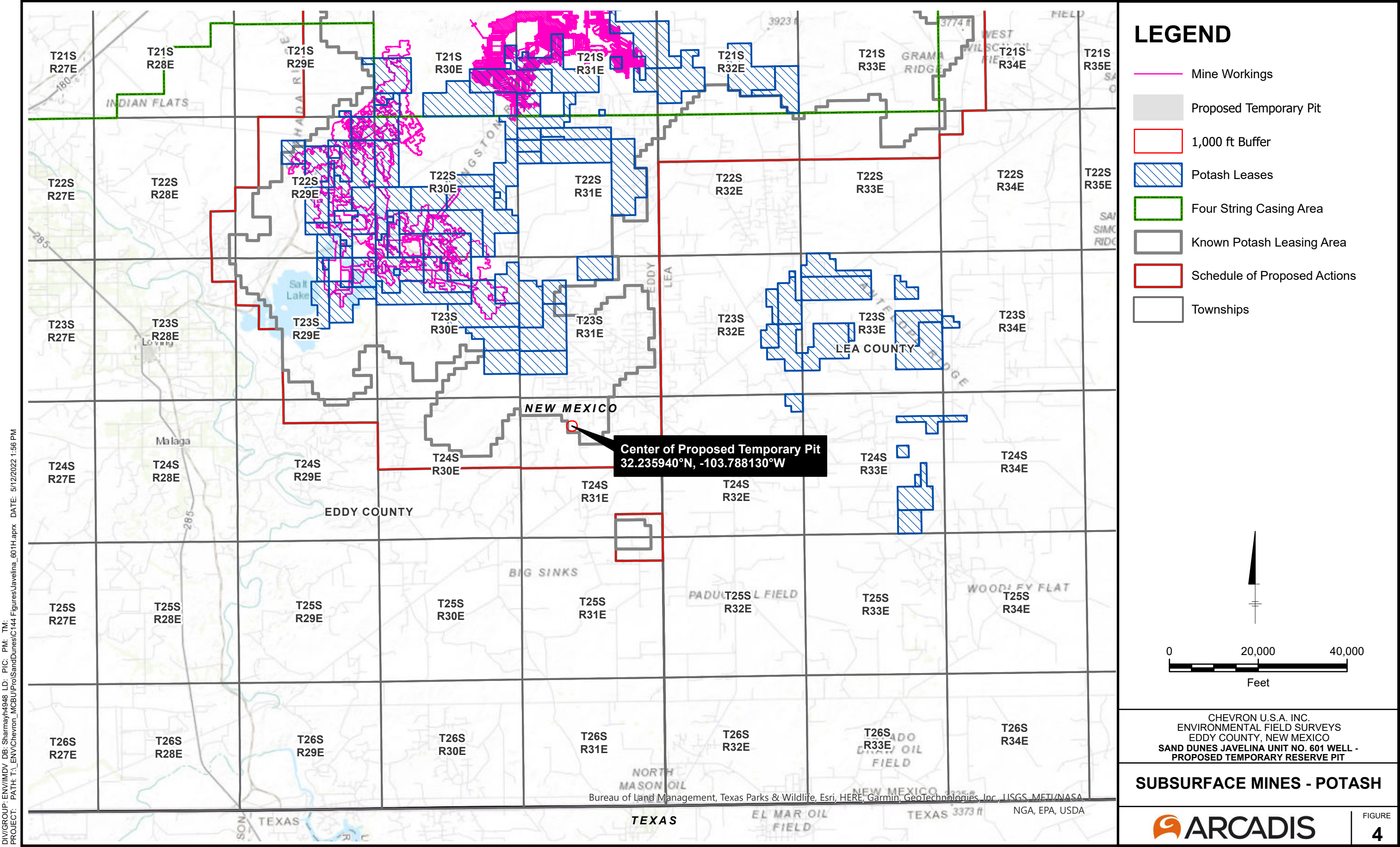


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SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

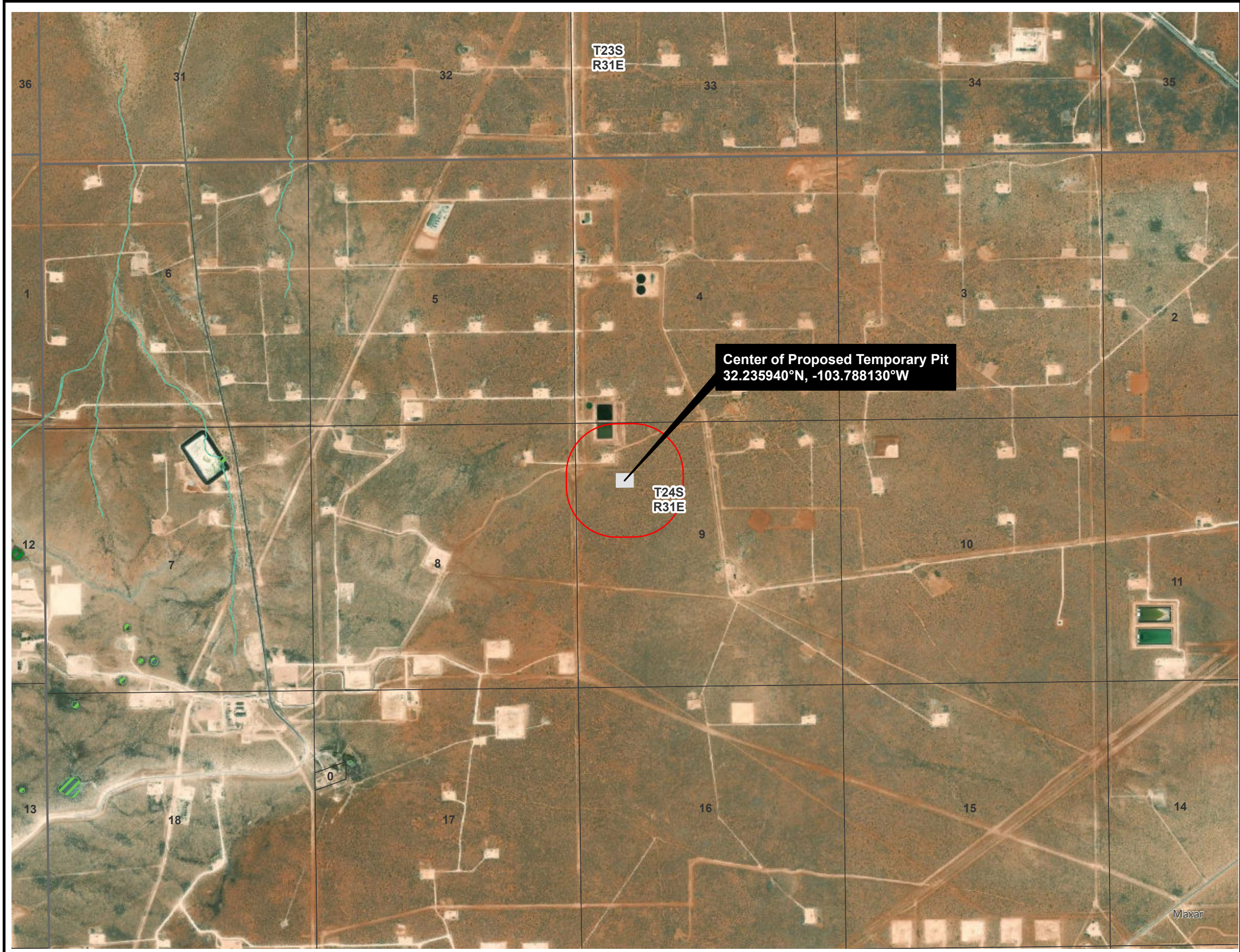
FLOODPLAIN MAP

FIGURE  
3





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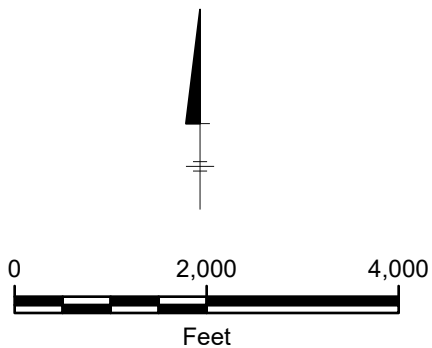


**LEGEND**

- Proposed Temporary Pit
- 1,000 ft Buffer
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Riverine
- Townships
- Sections

Notes:  
1. USFWS - United States Fish and Wildlife Service  
2. NWI - National Wetlands Inventory

Data Source: USFWS NWI.



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ENVIRONMENTAL FIELD SURVEYS  
EDDY COUNTY, NEW MEXICO  
SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

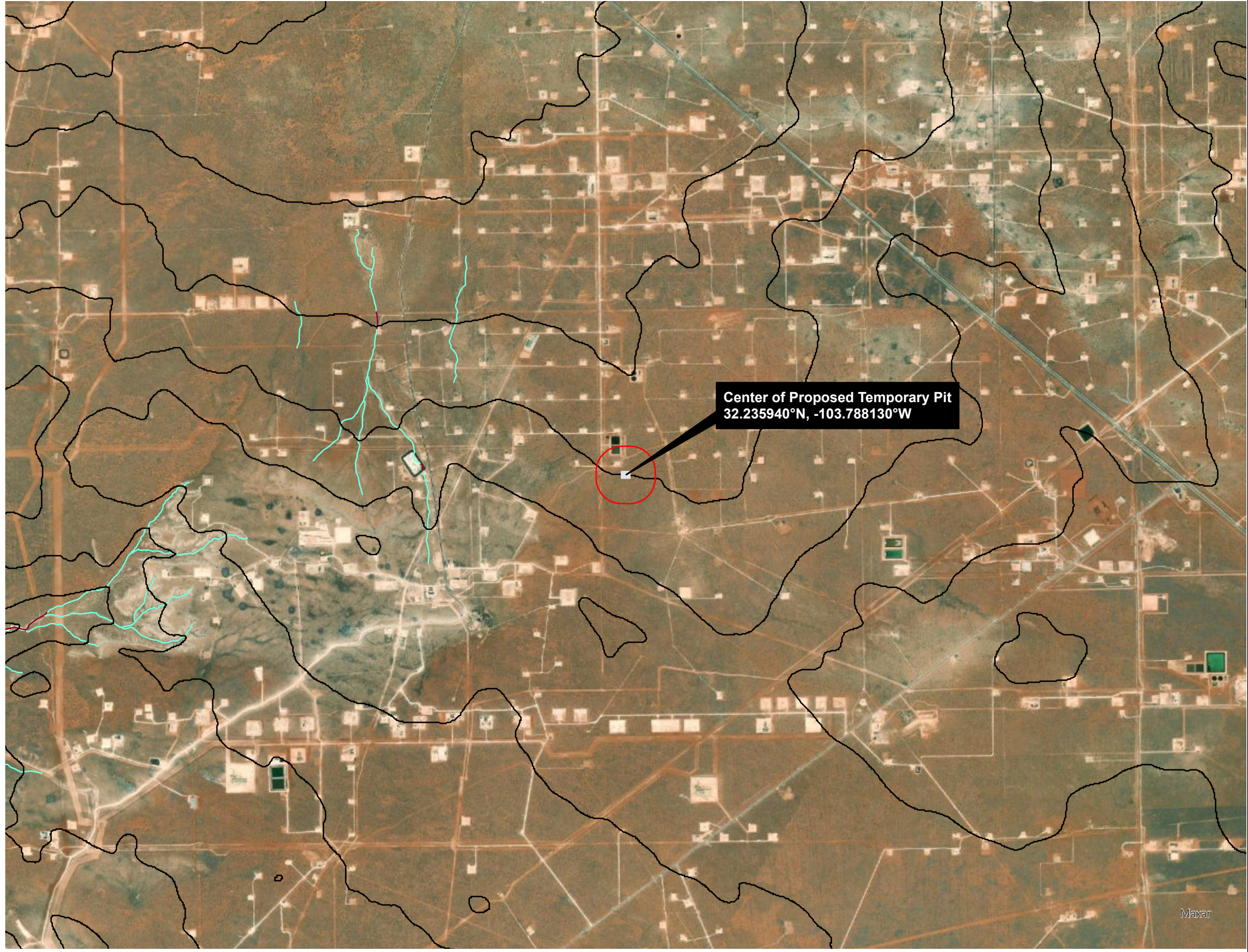
**WETLANDS MAP**



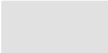





FIGURE  
**5**



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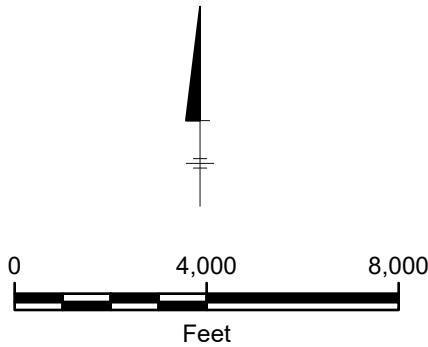


**LEGEND**

-  Proposed Temporary Pit
-  1,000 ft Buffer
-  Wash
-  ArtificialPath
-  StreamRiver
-  USGS Contour Lines NM

Notes:  
1. USGS - United Geological Survey  
2. NHD - National Hydrography Dataset

Data Source: BLM CFO. 2018. USGS NHD.



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EDDY COUNTY, NEW MEXICO  
SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

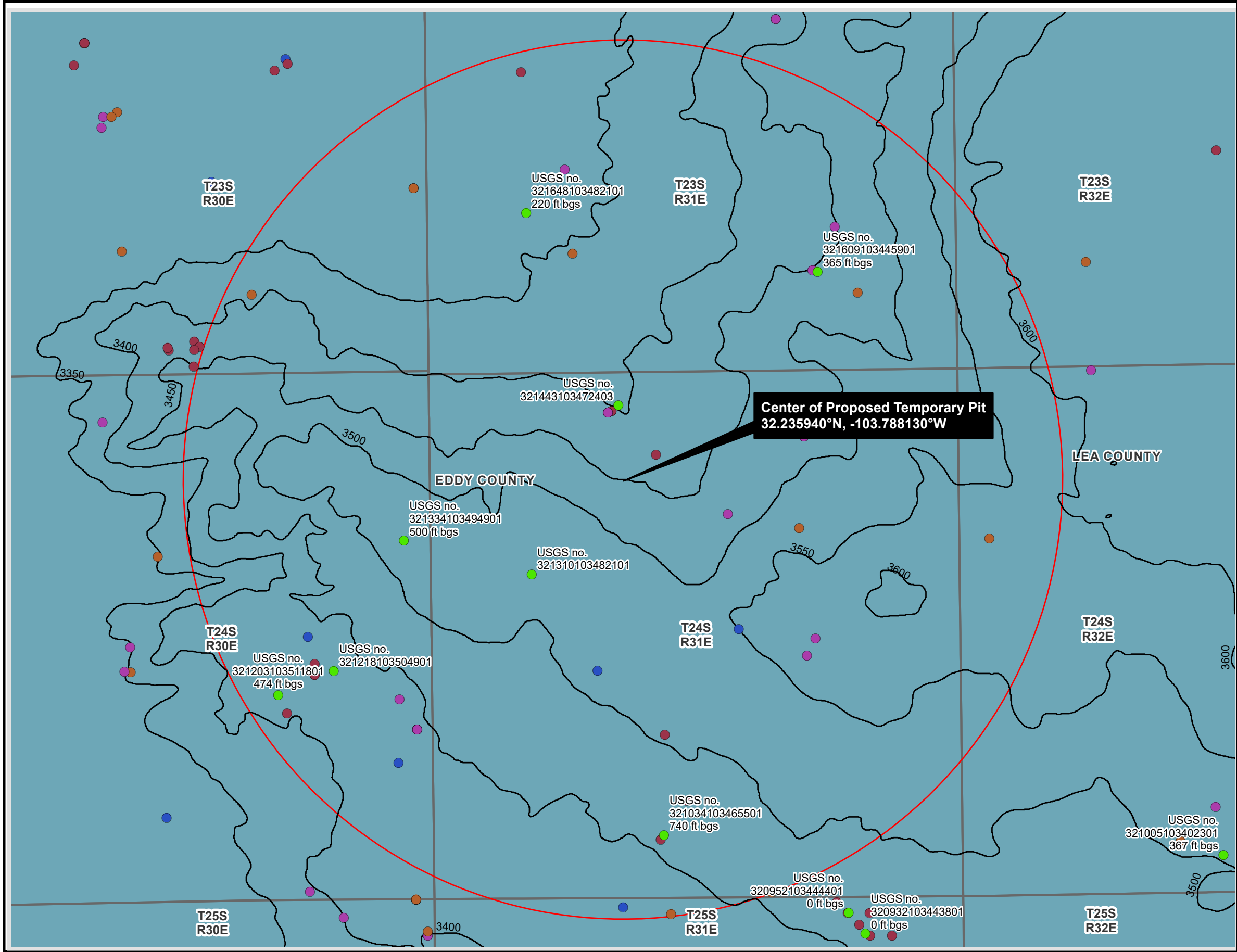
**ELEVATION CONTOUR & NHD MAP**



FIGURE  
**6**



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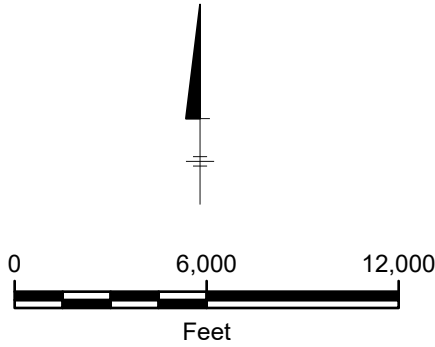


LEGEND

- USGS Contour Lines
- 5 Mile Buffer
- Townships
- USGS Groundwater Wells
- OSE POD Wells
  - Active
  - Pending
  - Plugged
  - Unknown
- Pecos River Basin Alluvial Aquifer

Notes:  
1. USGS - United States Geological Survey  
2. NMOSE - New Mexico Office of the State Engineer

Data Source: USGS and NMOSE.



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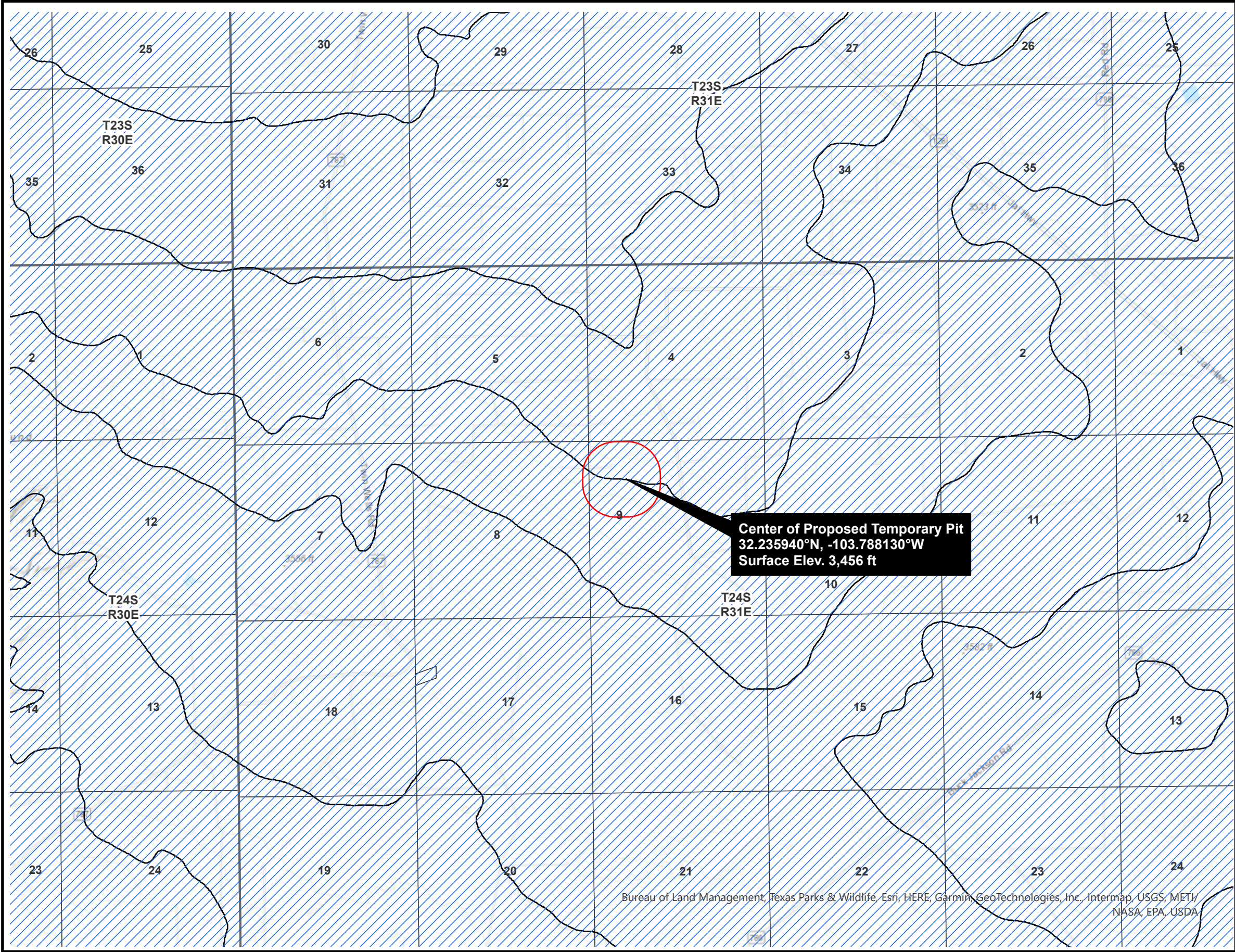
SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

**USGS AND NMOSE  
GROUNDWATER WELLS**

**ARCADIS**

FIGURE  
**7**

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LEGEND

- USGS Contour Lines NM
- 1,000 ft Buffer
- Townships
- Sections
- Karst Occurence Potential**
  - Low

Center of Proposed Temporary Pit  
32.235940°N, -103.788130°W  
Surface Elev. 3,456 ft

CHEVRON U.S.A. INC.  
EDDY COUNTY, NEW MEXICO  
SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

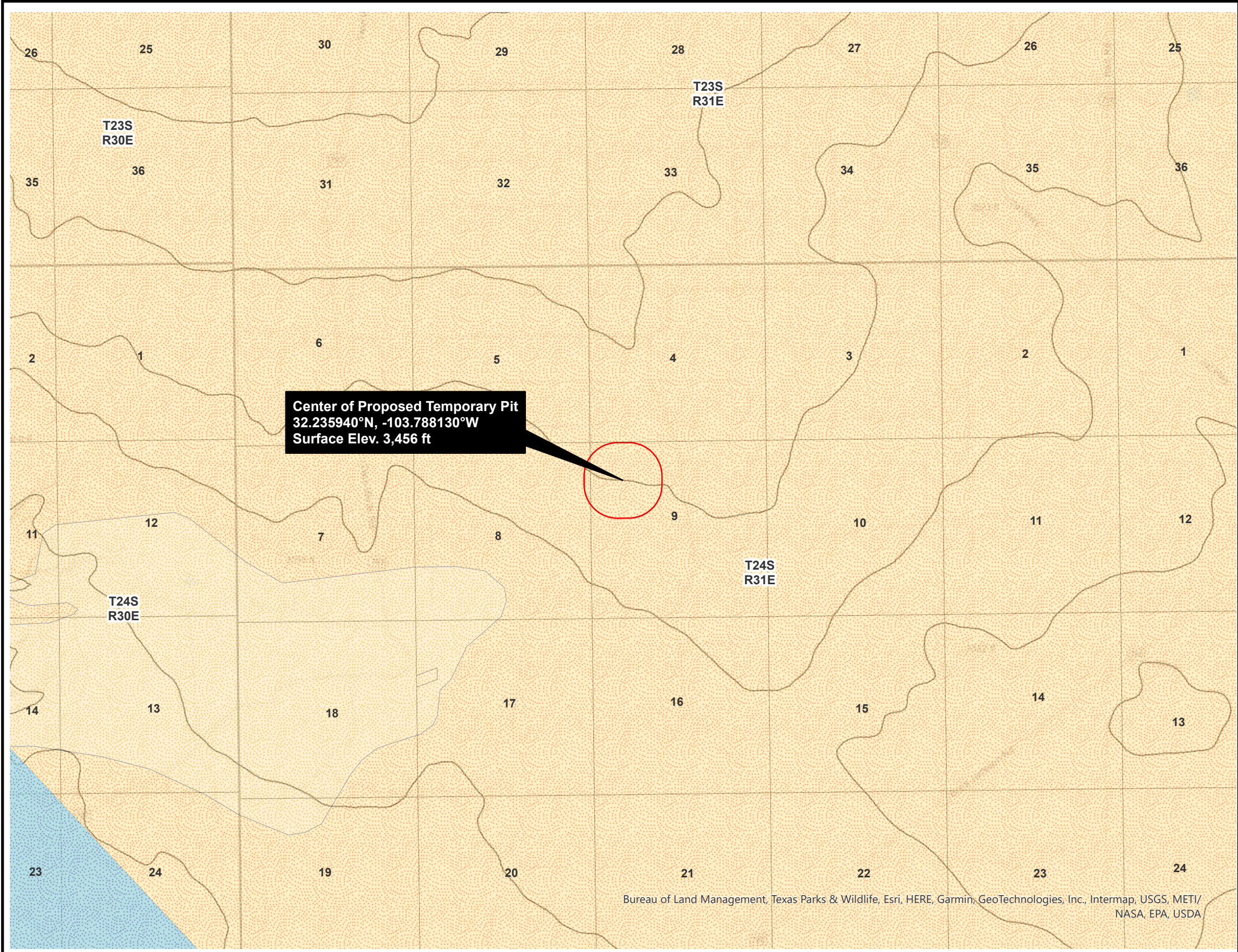
KARST POTENTIAL



FIGURE  
8



DIV/GRP: ENV/MDV DB: Sharmay4948 LD: PIC: PM: TM: DATE: 5/12/2022 2:02 PM  
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### LEGEND

- USGS Contour Lines NM
- 1,000 ft Buffer
- Townships
- Sections

#### Aquifer

- Pecos River Basin Alluvial

#### Geology

- Qe/Qp
- Qp

Qe: Quaternary Eolian Deposits  
Qp: Quaternary Piedmont Deposits

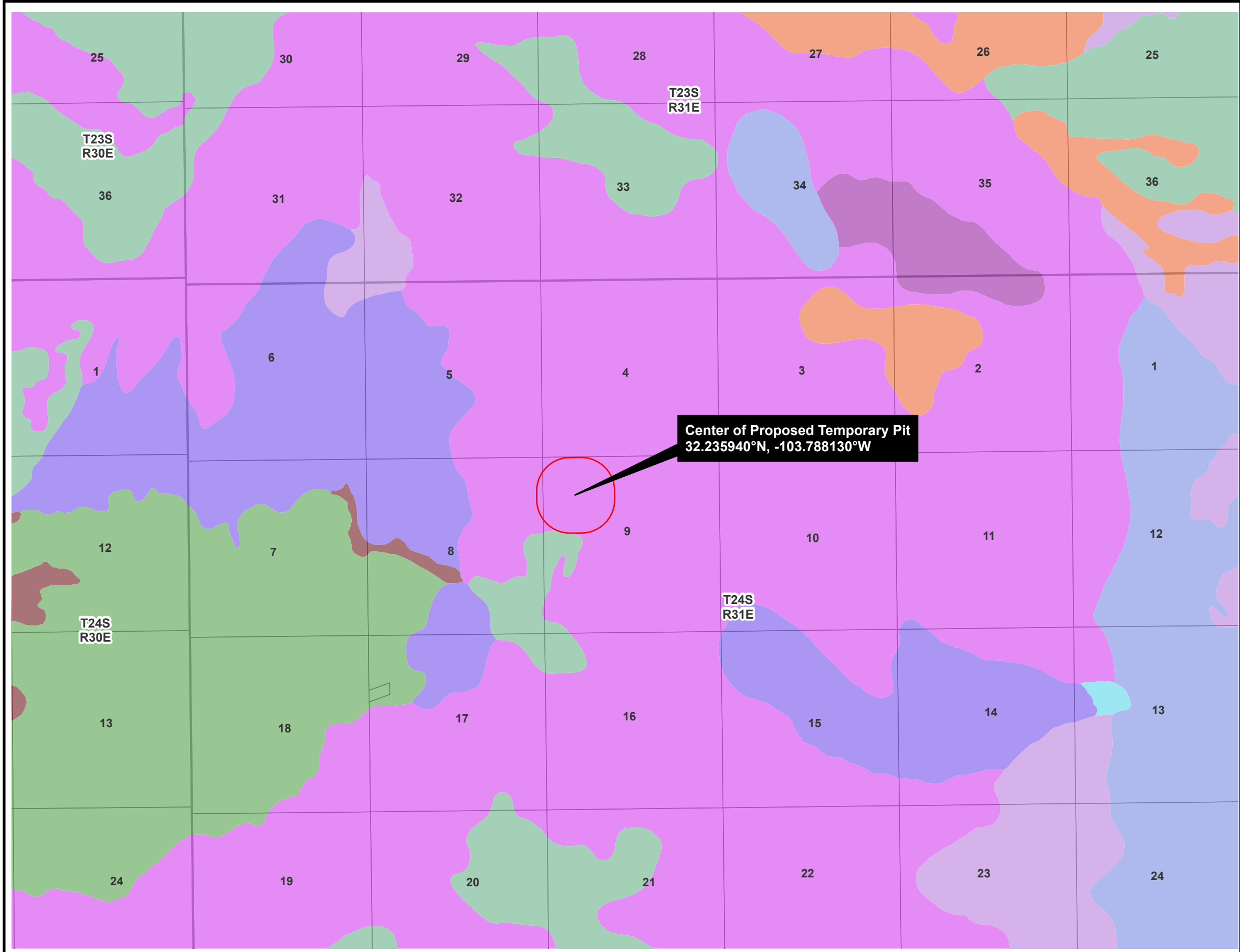
CHEVRON U.S.A. INC.  
EDDY COUNTY, NEW MEXICO

SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

### LOCAL GEOLOGY

FIGURE  
9

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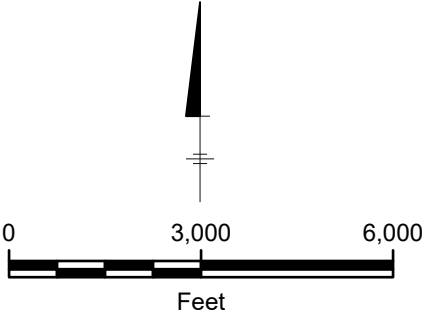


**LEGEND**

- 1,000 ft Buffer
- Townships
- Sections

**Eddy County Soil Data**

- BA: Berino loamy fine sand, 0 to 3 percent slopes
- BB: Berino complex, 0 to 3 percent slopes, eroded
- BD: Berino-Dune land complex, 0 to 3 percent slopes
- CA: Cacique loamy sand, 0 to 3 percent slopes, eroded
- KM: Kermit-Berino fine sands, 0 to 3 percent slopes
- PA: Pajarito loamy fine sand, 0 to 3 percent slopes, eroded
- PS: Potter-Simona complex, 5 to 25 percent slopes
- SM: Simona-Bippus complex, 0 to 5 percent slopes
- SN: Simona and Wink fine sandy loams, 0 to 3 percent slopes, eroded
- TF: Tonuco loamy fine sand, 0 to 3 percent slopes



CHEVRON U.S.A. INC.  
EDDY COUNTY, NEW MEXICO  
SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

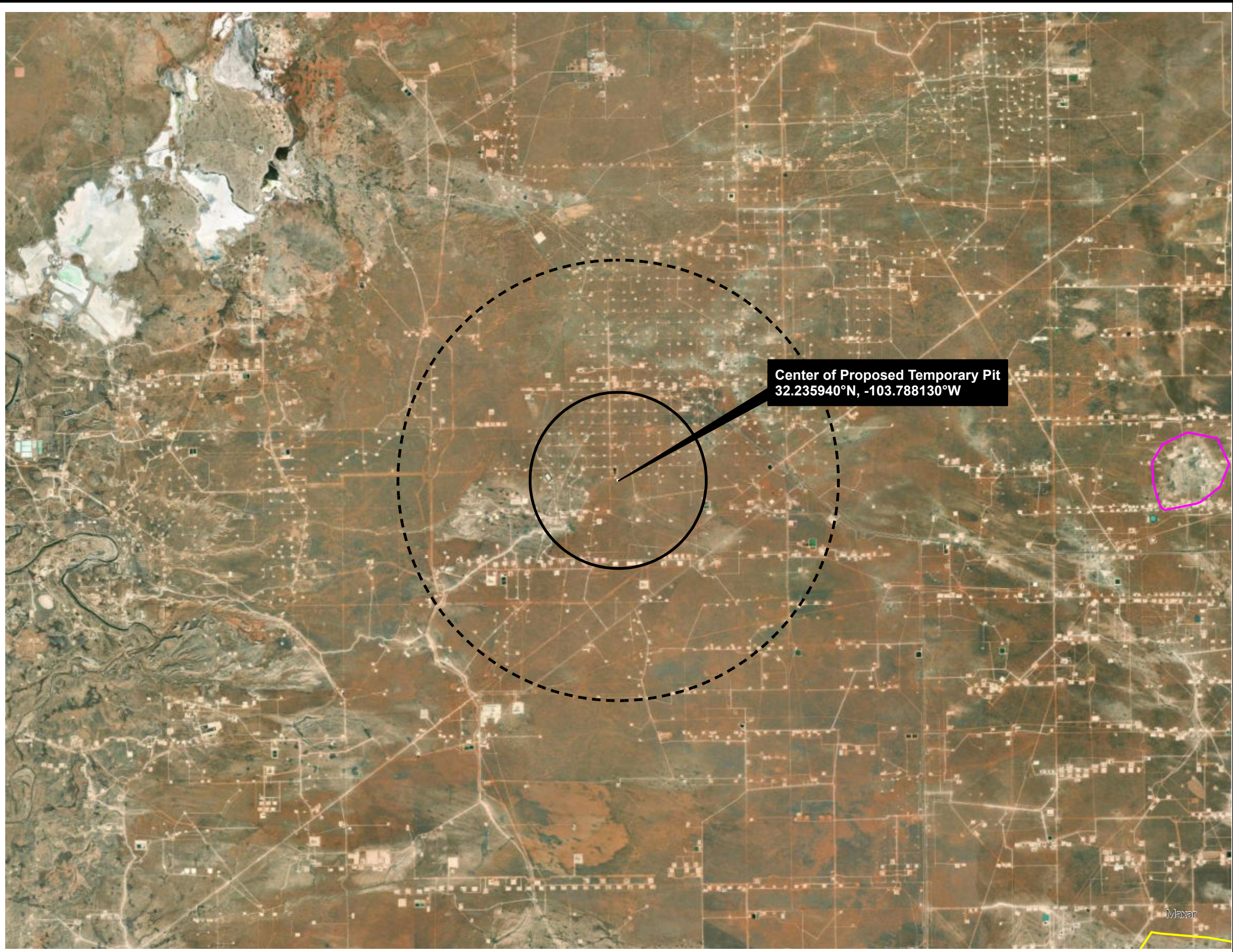
**SOILS**

**ARCADIS**






FIGURE  
**10**

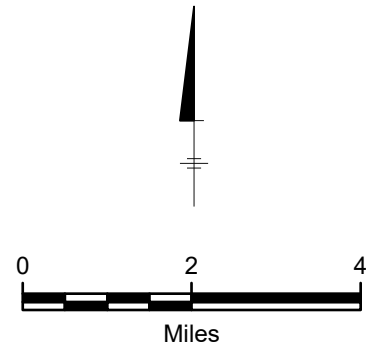


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**LEGEND**

-  Proposed Temporary Pit
-  Bell Lake Sink
-  Area with Multiple Small Depressions
-  2 Mile Buffer
-  5 Mile Buffer



CHEVRON U.S.A. INC.  
EDDY COUNTY, NEW MEXICO

SAND DUNES JAVELINA UNIT NO. 601 WELL -  
PROPOSED TEMPORARY RESERVE PIT

**AERIAL IMAGERY OF  
DISSOLUTION FEATURES**

 **ARCADIS**

FIGURE  
**11**



### **Variance Requests**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

**Variance Requests****Javelina Unit 601 (601H, 602H, 603H, 501H, 502H)****Temporary Pit****Variance Request 1 of 2 – Extension of Closure Timeline for Temporary Pit****Reason for the requested variance**

The Operator wishes to standardize closure practices and procedures across all active development areas where Temporary Pits are used. A closure timeline extension allows for improved flexibility in managing closure operations and would improve efficiency by allowing the closure of multiple pits during a single campaign.

The closure timeline is stated with the definition of a Temporary Pit, in that a pit *“must be closed within six months from the date the operator releases the drilling or workover rig from the first well using the pit”*.

For purposes of this variance, the Operator proposes a timeline based on the date of the first occurrence of Rig Down Move Out (RDMO). RDMO is defined as the activity when the drilling rig is moved off location. Typically, RDMO occurs after the completion of drilling the last well on the pad. On pads where the Operator plans to return to the pad, multiple RDMO dates occur. This variance does not consider subsequent RDMO affecting the closure timeline dates after the first RDMO. The Operator proposes dewatering the pit within 30 days of RDMO and proposes closing the pits within 1 year of RDMO.

The Operator uses a batch drilling process for drilling multiple wells on a single pad. The common procedure is to drill all the surface hole sections first followed by intermediate hole sections and finally production hole sections. The drilling rig skid moves to the next well without performing rig down activities when batch drilling. For the proposed four-well pad, the rig drills surfaces in the order of wells one to four, then intermediates in the order of wells four to one, and finally productions in the order of one to four. Note that specific orders may change based off well design and location specific factors, but the process of skidding and batch drilling is consistent throughout.

If the Operator ceases operations before drilling is complete and the rig is moved off the pad location, this constitutes a RDMO date and the 1-year closure criteria is based off the earliest RDMO date.

The Operator may utilize a shallow rig for drilling of only the surface and/or intermediate hole sections, if permitted to do so. The rig down and move out of the shallow rig does not constitute an RDMO date if the larger rig intending to drill production holes arrives within 3 months.

**Demonstration that the variance will provide equal or better protection of fresh water, public health and the environment.**

In order to uphold the Operator's commitment to people and the environment, the following assurances will be provided in excess of the baseline requirements of 19.15.17 NMAC.

- The Operator will dewater the Temporary Pit within 30 days after RDMO.
- The Operator will utilize a 40-mil HDPE liner, as proposed in **Variance 2**.
- No fluid will be stored in the pit for any purpose after the completion of drilling activities other than in the event of emergency actions as described in 19.15.17.14 NMAC.
- The pits will be visually inspected on a monthly basis between RDMO and closure.
- If fluid is seen in the pit during inspection, then the Operator will mobilize equipment to have the pits drained within 7 days.
- The operator will maintain a fence around the perimeter of the pits and ensure it remains in good repair until closure.



**Variance Request 2 of 2 – Proposed Use of High-Density Polyethylene (HDPE) Liner for Temporary Pit in lieu of Linear Low-Density Polyethylene (LLDPE) Liner****Memorandum**

To: New Mexico Oil Conservation Division (NMOCD)

From: Chevron MCBU - Facilities Engineering Group

Subject: Variance Request for Use of HDPE Liner Material for Temporary Reserve Pits in New Mexico

Date: 7/23/2020

Chevron requests a variance to NMAC 19.15.17.11 (F) for use of high-density polyethylene (HDPE) geomembrane for the lining of temporary drilling reserve pits. HDPE is a preferred material which Chevron will install during drilling reserve pit construction. Chevron will utilize an HDPE geomembrane which offers equal or better performance than a typically available 20-mil string reinforced linear low-density polyethylene (LLDPE) material detailed in 19.15.17.11 (F), NMAC. An HDPE liner of equivalent thickness or greater than the 20-mil LLDPE will be installed. The following are considered in the design for implementation of the HDPE material to ensure the product is an equivalent, to the LLDPE material described, for temporary reserve drilling pits in New Mexico.

- An HDPE liner that has a thickness of less than 30-mils will be installed in a reserve pit as a shop-fabricated, extruded liner, and will not be field welded. Only HDPE liners of 30-mils in thickness or greater will be field welded for use in the temporary reserve pits.
- HDPE has lower permeability compared to LLDPE. This provides high barrier protection for soils during drilling operations and usage of the pits.
- HDPE may be installed with an underlying geotextile or similar material to provide additional protection from puncture or stress cracking. The subgrade for the liner system will be screened of deleterious materials and rocks and will be suitable for the liner installation. The use of geotextile or similar material will be evaluated on a specific case-by-case basis by Chevron.
- The HDPE liner used in Chevron's temporary reserve pits will have an equivalent or higher tear resistance and puncture resistance than that of a typical 20-mil string reinforced liner.
- HDPE material properties and liner has improved UV resistance to degradation when compared to LLDPE. This allows for extended life and improved long-term durability in pit liner applications.

All requirements for temporary pits' design and construction will be met in accordance with NMAC 19.15.17.11 and liner compatibility will comply with EPA SW-846 Method 9090A. Any requirements that may not be able to be adequately addressed, will be addressed under a separate variance request on a case-by-case basis.

*Disclaimer: Tetra Tech, Inc. has not evaluated the full design of temporary reserve pits for Chevron and is not involved in the construction or operation of Chevron's lined, temporary reserve pits. Chevron understands that they will ensure that specific pit designs meet the criteria and intent of the NMAC and applicable codes for each pit location and construction.*



7/23/2020  
Nathan Langford, P.E.  
Tetra Tech, Inc.



## TECHNICAL DATA SHEET

HDPE Series, 40 mils

Black, Smooth

2801 Boul. Marie-Victorin Varennes, Quebec Canada J3X 1P7  
 Tel: (450) 929-1234 Sales: (450) 929-2544 Toll free in North America: 1-800-571-3904 www.Solmax.com www.solmax.com

PROPERTY	TEST METHOD	FREQUENCY <sup>(1)</sup>	UNIT Imperial	
<b>SPECIFICATIONS</b>				
Thickness (min. avg.)	ASTM D5199	Every roll	mils	40.0
Thickness (min.)	ASTM D5199	Every roll	mils	36.0
Melt Index - 190/2.16 (max.)	ASTM D1238	1/Batch	g/10 min	1.0
Sheet Density (8)	ASTM D792	Every 10 rolls	g/cc	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 & Cat. 2
OIT - standard (avg.)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg.) (2)	ASTM D6693	Every 2 rolls		
Strength at Yield			ppi	88
Elongation at Yield			%	13
Strength at Break			ppi	162
Elongation at Break			%	700
Tear Resistance (min. avg.)	ASTM D1004	Every 5 rolls	lbf	28
Puncture Resistance (min. avg.)	ASTM D4833	Every 5 rolls	lbf	80
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	1/Batch Per	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	formulation		
HP OIT (min. avg.)	ASTM D5885		%	80
UV Res. - % retained after 1600 hr	ASTM D7238	Per formulation		
HP-OIT (min. avg.)	ASTM D5885		%	50
Low Temperature Brittleness	ASTM D746	Certified	°F	- 106
<b>SUPPLY SPECIFICATIONS</b> (Roll dimensions may vary ±1%)				

## NOTES

1. Testing frequency based on standard roll dimension and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
8. Correlation table is available for ASTM D792 vs ASTM D1505. Both methods give the same results.

\* All values are nominal test results, except when specified as minimum or maximum.

\* The information contained herein is provided for reference purposes only and is not intended as a warranty of guarantee. Final determination of suitability for use contemplated is the sole responsibility of the user. SOLMAX assumes no liability in connection with the use of this information.

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.



## TECHNICAL DATA SHEET

HDPE Series, 40 mils

Black, Top Side Single Textured

2801 Boul. Marie-Victorin Varennes, Quebec Canada J3X 1P7  
 Tel: (450) 929-1234 Sales: (450) 929-2544 Toll free in North America: 1-800-571-3904 www.Solmax.com www.solmax.com

PROPERTY	TEST METHOD	FREQUENCY <sup>(1)</sup>	UNIT Imperial	
<b>SPECIFICATIONS</b>				
Nominal Thickness		-	mils	40
Thickness (min. avg.)	ASTM D5994	Every roll	mils	38.0
Lowest ind. for 8 out of 10 values			mils	36.0
Lowest ind. for 10 out of 10 values			mils	34.0
Asperity Height (min. avg.) (3)	ASTM D7466	Every roll	mils	16
Textured side		-		Top
Melt Index - 190/2.16 (max.)	ASTM D1238	1/Batch	g/10 min	1.0
Sheet Density (8)	ASTM D792	Every 10 rolls	g/cc	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 & Cat. 2
OIT - standard (avg.)	ASTM D3895	1/Batch	min	100
Tensile Properties (min. avg) (2)	ASTM D6693	Every 2 rolls		
Strength at Yield			ppi	88
Elongation at Yield			%	13
Strength at Break			ppi	88
Elongation at Break			%	150
Tear Resistance (min. avg.)	ASTM D1004	Every 5 rolls	lbf	30
Puncture Resistance (min. avg.)	ASTM D4833	Every 5 rolls	lbf	90
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	1/Batch Per	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	formulation		
HP OIT (min. avg.)	ASTM D5885		%	80
UV Res. - % retained after 1600 hr	ASTM D7238	Per formulation		
HP-OIT (min. avg.)	ASTM D5885		%	50
Low Temperature Brittleness	ASTM D746	Certified	°F	- 106
<b>SUPPLY SPECIFICATIONS</b> (Roll dimensions may vary ±1%)				

## NOTES

1. Testing frequency based on standard roll dimension and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
3. Lowest individual and 8 out of 10 readings as per GRI-GMI3 / 17, latest version.
8. Correlation table is available for ASTM D792 vs ASTM D1505. Both methods give the same results.

(Rev. 03 / 2018-05-31)

## **Appendix A**

United States Geological Survey  
Groundwater Data

**USGS 321648103482101 23S.31E.29.11333****DESCRIPTION:**

Latitude 32°16'48", Longitude 103°48'21" NAD27

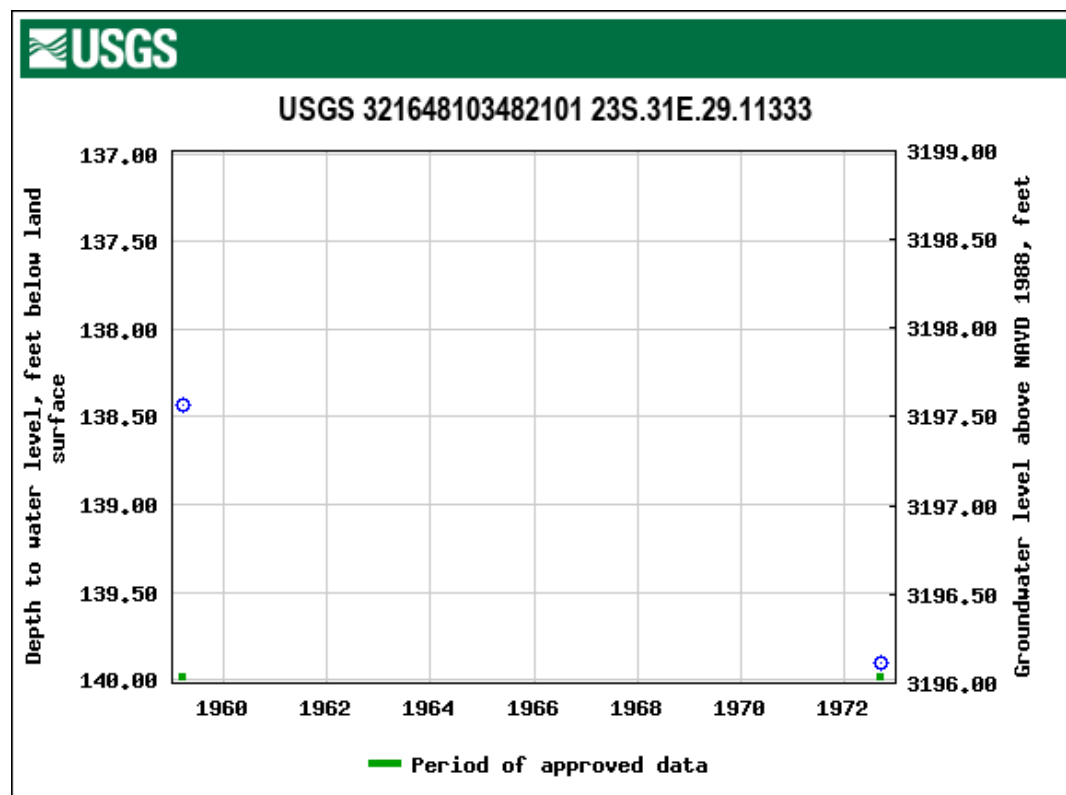
Eddy County, New Mexico, Hydrologic Unit 13060011

Well depth: 220 feet

Land surface altitude: 3,336 feet above NAVD88.

Well completed in "Other aquifers" (N9999OTHER) national aquifer.

Well completed in "Dewey Lake Redbeds" (312DYLK) local aquifer.



**USGS 321609103445901 23S.31E.26.34411****DESCRIPTION:**

Latitude 32°16'11.9", Longitude 103°45'01.2" NAD83

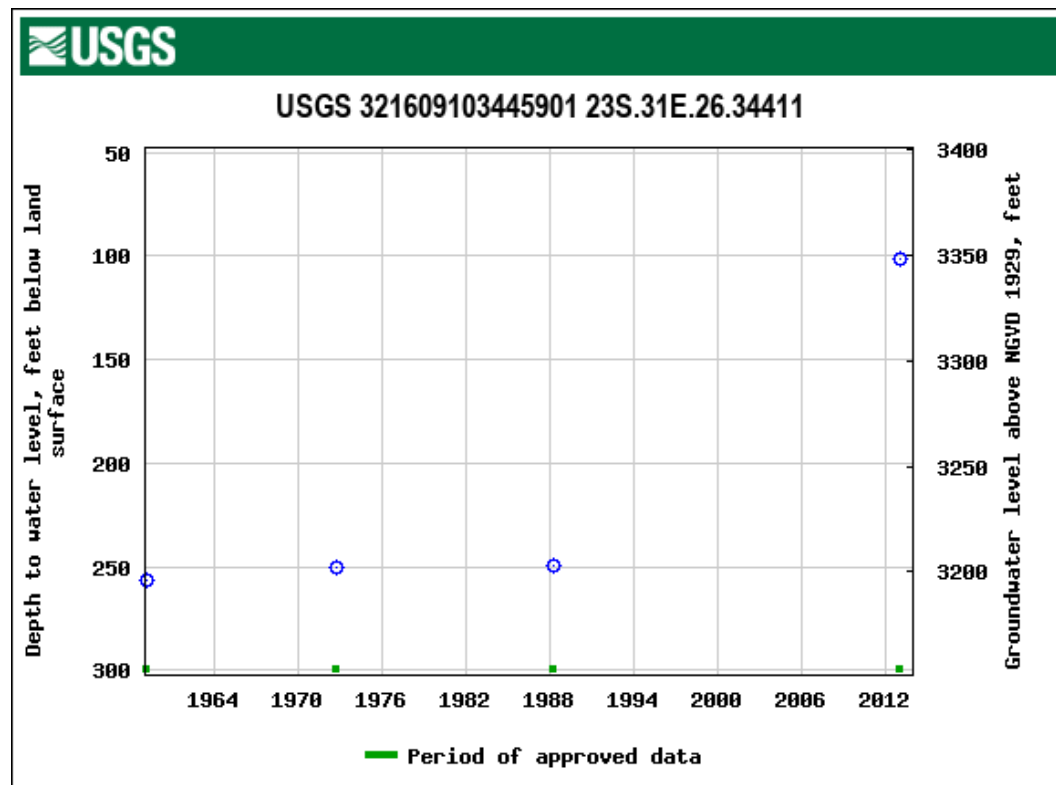
Eddy County, New Mexico , Hydrologic Unit 13060011

Well depth: 365 feet

Land surface altitude: 3,451.00 feet above NGVD29.

Well completed in "Other aquifers" (N9999OTHER) national aquifer.

Well completed in "Dewey Lake Redbeds" (312DYLK) local aquifer.





**USGS 321443103472403 24S.31E.04.1341 H-9C**

## DESCRIPTION:

Latitude 32°14'53", Longitude 103°47'18" NAD27

Eddy County, New Mexico, Hydrologic Unit 13060011

Well depth: not determined.

Land surface altitude: 3,397 feet above NGVD29.

Well completed in "Other aquifers" (N9999OTHER) national aquifer.

Well completed in "Rustler Formation, Unnamed Lower Member" (312RSLRL) local aquifer

\*No graph available

**USGS 321334103494901 24S.30E.12.432344**

## DESCRIPTION:

Latitude 32°13'34", Longitude 103°49'49" NAD27

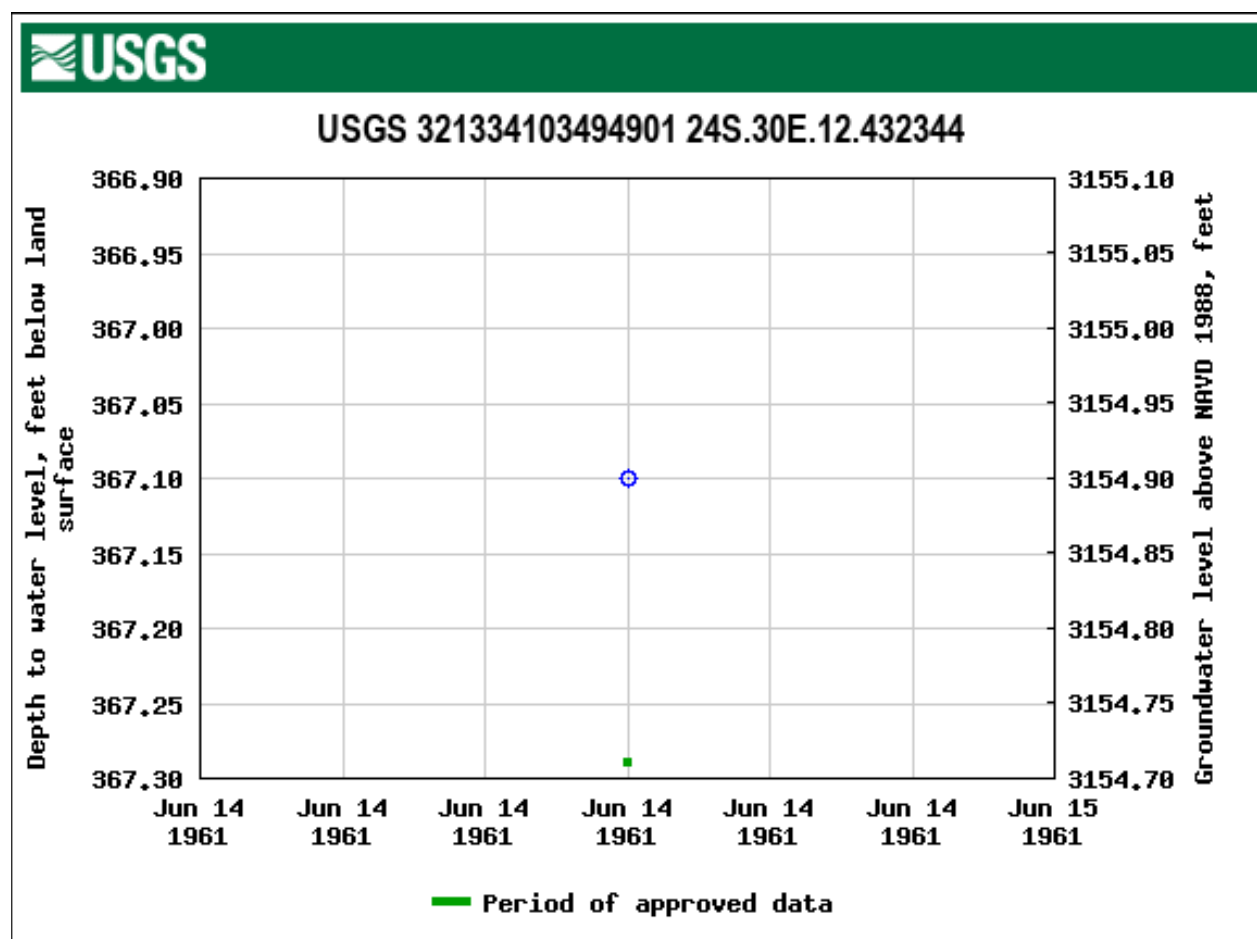
Eddy County, New Mexico, Hydrologic Unit 13060011

Well depth: 500 feet

Land surface altitude: 3,522 feet above NAVD88.

Well completed in "Other aquifers" (N9999OTHER) national aquifer.

Well completed in "Rustler Formation" (312RSLR) local aquifer



**USGS 321310103482101 24S.31E.17.13120****DESCRIPTION:**

Latitude 32°13'14.1", Longitude 103°48'23.4" NAD83

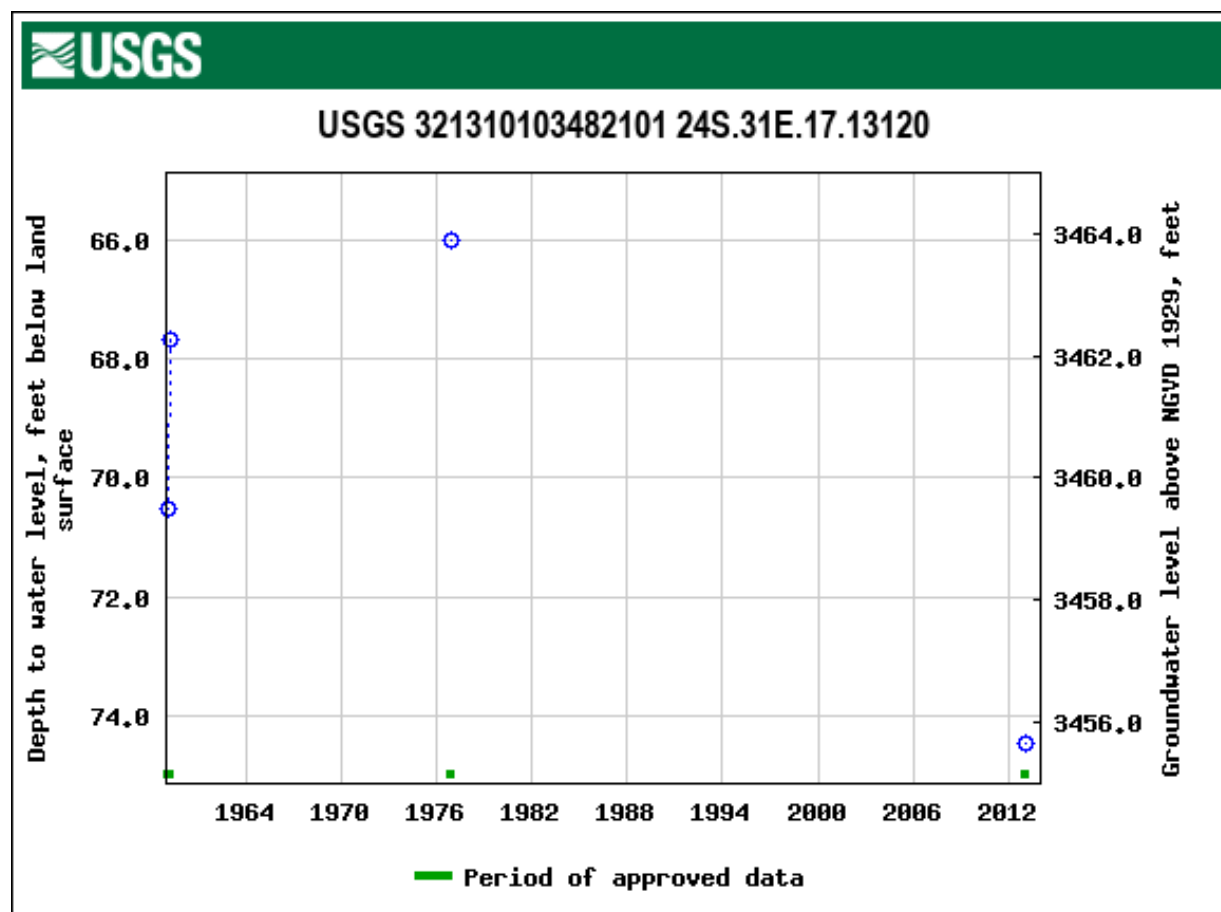
Eddy County, New Mexico, Hydrologic Unit 13060011

Well depth: not determined.

Land surface altitude: 3,530.00 feet above NGVD29.

Well completed in "Other aquifers" (N9999OTHER) national aquifer.

Well completed in "Alluvium, Bolson Deposits and Other Surface Deposits" (110AVMB) local aquifer.



**USGS 321218103504901 24S.30E.23.2423 H-8A****DESCRIPTION:**

Latitude 32°12'17", Longitude 103°50'39" NAD27

Eddy County, New Mexico, Hydrologic Unit 13060011

Well depth: not determined.

Land surface altitude: 3,434 feet above NGVD29.

Well completed in "Pecos River Basin alluvial aquifer" (N100PCSRVR) national aquifer.

\*No graph available

**USGS 321203103511801 24S.30E.23.3124143****DESCRIPTION:**

Latitude 32°12'03", Longitude 103°51'18" NAD27

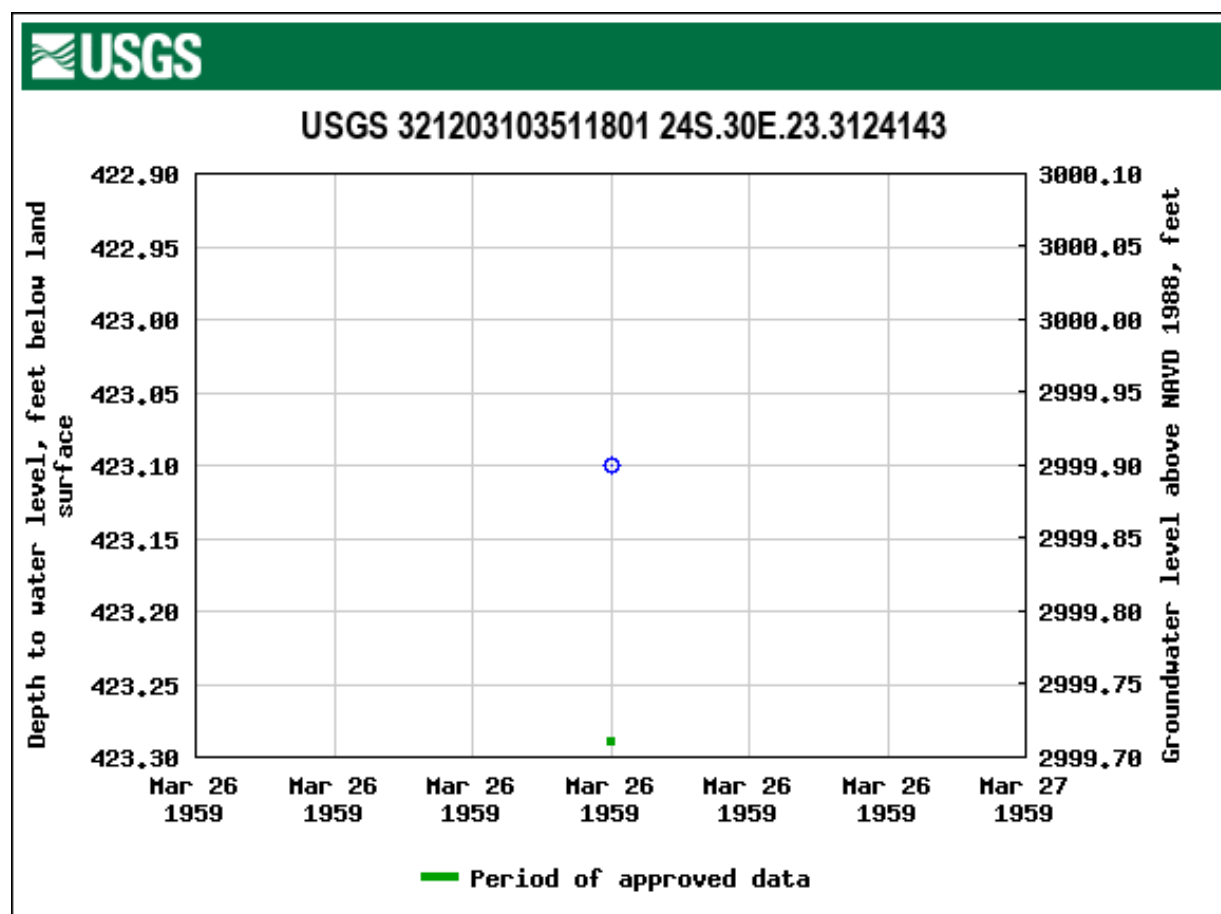
Eddy County, New Mexico, Hydrologic Unit 13060011

Well depth: 474 feet

Land surface altitude: 3,423 feet above NAVD88.

Well completed in "Pecos River Basin alluvial aquifer" (N100PCSRVR) national aquifer.

Well completed in "Rustler Formation" (312RSLR) local aquifer



## **Appendix B**

New Mexico Office of the State Engineer

Water Column/Average Depth to Water Data



# New Mexico Office of the State Engineer

## Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced,  
O=orphaned,  
C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
<a href="#">C 02783</a>	CUB	ED	3	3	1	04	24S	31E	613911	3568461		1208	708		
<a href="#">C 02783 POD2</a>	CUB	ED	3	3	1	04	24S	31E	613911	3568461		1208	672		
<a href="#">C 02784</a>	C	ED	4	2	4	04	24S	31E	613911	3568461		1208	584		
<a href="#">C 02661</a>	CUB	ED	3	3	1	04	24S	31E	613969	3568485*		1221	708		
<a href="#">C 02785</a>	CUB	ED	3	3	1	04	24S	31E	613969	3568485*		1221	692		
<a href="#">C 02440</a>	C	ED	2	3	10	24S	31E	616103	3566599*		2088	350			
<a href="#">C 02460</a>	C	ED	3	02	24S	31E	617496	3568022*		3451	320				
<a href="#">C 02460 POD2</a>	C	ED	3	02	24S	31E	617496	3568022*		3451	320				
<a href="#">C 04508 POD1</a>	CUB	ED	4	4	3	15	24S	31E	616298	3564493		3528	110		
<a href="#">C 04499 POD1</a>	CUB	ED	3	4	2	20	24S	31E	613719	3563732		3564	111		
<a href="#">C 02464</a>	C	ED	2	3	1	02	24S	31E	617645	3568581		3753	320	205	115
<a href="#">C 02405</a>	CUB	ED	4	1	02	24S	31E	617690	3568631*		3813	275	160	115	
<a href="#">C 04576 POD1</a>	CUB	ED	1	2	1	23	24S	31E	617700	3564324		4632	910	850	60
<a href="#">C 04388 POD1</a>	C	ED	3	2	1	23	24S	31E	617546	3564006		4729	910	868	42
<a href="#">C 02348</a>	C	ED	1	4	3	26	23S	31E	617648	3571068		5176	700	430	270
<a href="#">C 02954 EXPL</a>	CUB	ED	3	1	4	20	23S	31E	613114	3572906*		5723	905		
<a href="#">C 03702 POD1</a>	CUB	ED	4	1	4	24	24S	30E	610092	3563204		5729	20		
<a href="#">C 03558 POD1</a>	CUB	ED	1	2	2	25	24S	30E	610412	3562651		5928	20	0	20
<a href="#">C 03558 POD2</a>	CUB	ED	1	2	2	25	24S	30E	610412	3562651		5928	20	0	20
<a href="#">C 03558 POD3</a>	CUB	ED	1	2	2	25	24S	30E	610412	3562651		5928	25	0	25
<a href="#">C 03558 POD4</a>	CUB	ED	1	2	2	25	24S	30E	610412	3562651		5928	25	0	25
<a href="#">C 03558 POD5</a>	CUB	ED	1	2	2	25	24S	30E	610412	3562651		5928	30	0	30
<a href="#">C 02258</a>	C	ED	3	2	26	23S	31E	618055	3571853*		6033	662			
<a href="#">C 04575 POD1</a>	CUB	ED	1	1	2	23	24S	30E	608412	3564355		6416	105		
<a href="#">C 02780</a>	CUB	ED	2	3	2	23	24S	30E	608535	3563857*		6552	505		
<a href="#">C 04478 POD1</a>	CUB	ED	3	3	2	25	24S	30E	610077	3562041		6615	0	0	0

\*UTM location was derived from PLSS - see Help

(A CLW##### in the  
POD suffix indicates the  
POD has been replaced  
& no longer serves a  
water right file.)

(R=POD has  
been replaced,  
O=orphaned,  
C=the file is  
closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-Code	basin	County	Q 6	Q 4	Q 16	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
<a href="#">C 02781</a>	CUB	ED		4	3	2	23	24S	30E	608535	3563657*	6658	624		
<a href="#">C 02782</a>	CUB	ED		4	3	2	23	24S	30E	608535	3563657*	6658	808		
<a href="#">C 04633 POD1</a>	CUB	ED		2	1	1	35	24S	31E	617394	3561170	6923			
<a href="#">C 02110</a>	CUB	ED			4	3	23	24S	30E	608036	3562950*	7468	600	400	200
<a href="#">C 04636 POD1</a>	CUB	ED		3	4	3	25	24S	31E	619200	3561279	7852			
<a href="#">C 04479 POD1</a>	CUB	ED		2	1	1	04	25S	31E	614182	3559400	7873	0	0	0

Average Depth to Water: **224 feet**

Minimum Depth: **0 feet**

Maximum Depth: **868 feet**

Record Count: 32

**Basin/County Search:**

**County:** Eddy

**UTM NAD83 Radius Search (in meters):**

**Easting (X):** 614126.37

**Northing (Y):** 3567273.2

**Radius:** 8045

\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data.

6/30/22 1:32 PM

Page 2 of 2

WATER COLUMN/ AVERAGE  
DEPTH TO WATER



## **Appendix C – Hydrogeologic Data**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

## **Appendix C – Hydrogeologic Data**

### **Sand Dunes 601**

#### **Temporary Pit**

#### **Topography and Surface Hydrology**

The location of the proposed temporary pit is in Eddy County, New Mexico between the Mescalero Ridge and the Pecos River in the Pecos Valley section of the Great Plains physiographic province. The pit lies at an elevation of 3,450 feet above sea level and the relatively flat to gentle sloping terrain with many shallow depressions, but no well-established drainages. (**Figure 7**).

Surface water within the proposed pit area is affected naturally by the shallow geology, precipitation, and some water erosion. The area is located in the semi-arid southwest near the northern edge of the Chihuahuan Desert. The climate is characterized by low annual precipitation, low humidity, and high average annual temperature and ranges from dry subhumid to arid. Precipitation is quite variable both regionally and seasonally and averages about 12 inches or less annually with the greatest rainfall occurring as monsoonal storms during the summer months. The area is situated at the southwest edge of the Great Plains dust-bowl area and is sometimes subjected to severe windstorms (Nicholson and Clebsch 1961).

Southeastern Eddy County, including the proposed pit area, lies within the Lower Pecos River Basin. The major stream in this Basin is the Pecos River, which is located approximately 12 miles to the west in southeastern Eddy County. Surface water in the Lower Pecos River Basin comes from three main sources: inflow from the Upper Pecos River Basin, flood inflow from storm events, and groundwater base inflow.

Anthropogenic activities that currently affect surface water resources in the proposed pit area include livestock grazing management and oil and gas development. No draws or other well-established drainage features occur in the proposed pit area and no drainages were observed during a field survey (Arcadis 2020).

#### **Soils**

The soil complex mapped within the survey area is the Berino Complex (BB) and is described further in the following table. A map depicting the soils mapped within the area is provided in **Figure 10**.

Table 1      Soils Within the Survey Area

Soil Abbreviation and Name	Slope	Soil Type
BB – Berino Complex	0 to 3 percent slope	Deep

### Loamy Sand Soil Type Description

All the soils within the survey area are classified as loamy sand soils. These loamy sand soils consist of the Berino. These soils are typically moderately deep or very deep soils that consist of loamy sand underlain by fine sands. Slopes range from 0 to 3 percent within these loamy sand soils. If these soils are unprotected by plant cover, they are easily wind blown into low hummocks. These soils have rapid permeability and are well drained. These soils support grassland vegetative communities dominated by species such as sand bluestem, yellow Indiangrass, black grama, dropseed species, and little bluestem. Dominant shrub species observed within these soils were creosote bush (*Larrea tridentate*), mesquite (*Prosopis glandulosa*), rubber rabbitbrush (*Ericameria nauseosa*), and yucca sp. (*Yucca sp.*). The annual grasses and forbs population will fluctuate with the variation of amount of rainfall annually and with the seasons. Without brush and graze control the vegetative communities within these soils will become shrub dominate, and there will be a loss of grass cover and increased surface soil erosion (USDA 2016).

### Geology

The area in the vicinity of the proposed pit location is underlain by recent eolian deposits consisting of drift sand a few feet in thickness and local occurrences of sand dunes (**Figure 9**). The eolian deposits are underlain by Pleistocene to recent alluvial deposits consisting of unconsolidated to partially consolidated sand, silt, gravel, clay and caliche. A thin layer of Tertiary Ogallala Formation may underlie the alluvium. Alluvium thickness in this area appears to be approximately 100 feet or less. Triassic Dockum strata underlie the alluvium deposits and its thickness appears to be approximately 400 to 500 feet. The Dockum Group has been divided into three formations: lower red shale, siltstone, and very fine-grained sandstone called the Tecovas Formation (or Pierce Canyon redbeds); middle reddish-brown and gray sandstone called the Santa Rosa sandstone; and upper brick-red to maroon and purple shale with thin beds of fine red or gray sandstone and siltstone called the Chinle Formation.

- The Tecovas or Pierce Canyon redbeds (considered Permian by some geologists and sometimes correlated with the Dewey Lake redbeds) overlie the Rustler Formation. The Tecovas' thickness is approximately 350 feet and it consists of red sandy shale and fine-grained sandstones with greenish-gray inclusions.
- The Santa Rosa sandstone consists of reddish-brown and gray, medium- to coarse-grained, micaceous, well-cemented sandstone and conglomerate. The sandstone is typically cross-bedded and is interbedded with red shale and siltstone. The thickness of the Santa Rosa sandstone generally ranges from approximately 200 to 300 feet over most of the area where it occurs.

### Appendix C – Hydrogeologic Data

- The Chinle Formation consists of a series of red shales and thin interbedded sandstones and appears to be about 200 feet thick in this area but can be as much as several hundred feet thick in other parts of southern Lea County (located to the east).

Dewey Lake redbeds (sometimes correlated with the Tecovas Formation) underlie the Triassic Dockum and overlie the Rustler Formation. Dewey Lake is a series of red beds consisting of micaceous red siltstone, shale, and sandstone with gypsum cementation

The Rustler Formation consists largely of anhydrite, gypsum, interbedded sandy clay and shale, and dolomitic limestone near the upper part of the formation. The Rustler overlies the Salado Formation and is approximately 400 feet thick in this area (Nicholson and Clebsch 1961). The Rustler typically consists of a lower clastic unit composed mainly of red and gray shale and some interbedded anhydrite and an upper anhydrite unit containing dolomitic limestone beds of varying thicknesses.

Geologic units in the general area which potentially contain usable groundwater are the Alluvium/Ogallala, the Dockum Group, and possibly the Rustler Formation.

## **Groundwater**

In the vicinity of the proposed pit, the Rustler Formation, Dockum Group and the Alluvium have the potential to provide small quantities of water to water supply wells. However, no water wells were found at in the immediate vicinity of the proposed site (**Figure 7**) with the closest well located approximately 1.6 miles to the southwest. Several water wells have been identified within 2 to 5 miles of the site) which are used primarily to support domestic, livestock and / or oil and gas exploration and development water needs. The depths of the wells indicate that some are completed in the Alluvium, some in the Triassic Dockum and some completed in the lower part of the Triassic Dockum or the Rustler Formation.

Depth to Water: An analysis of publicly available data from the NMOSE and USGS indicate that the depth to groundwater beneath the proposed location is in excess of 66 feet based on the closest well which is approximately 8,500 feet from the proposed site. The depths to water within a 5-mile radius of the proposed site range from 66 feet (approximately 1.6 miles north of the proposed site) to 868 feet in a Rustler Formation well located approximately 2.8 southeast of the proposed site.

Groundwater within 5 miles of the proposed location appears to be present in the Pecos River Basin Alluvial aquifer contained within Quaternary deposits present at surface and underlain by the Triassic Dockum Formation. In this area, the Alluvium appears to be approximately 100 feet in thickness. The proposed location, however, is not located above the mapped extent of the Pecos River Basin Alluvial aquifer. The Triassic Dockum formations which underlie the Alluvium/Ogallala are also sources of potable water. There are several water wells within 5 miles of the location based on the USGS and NMOSE data and zero water wells within 1 mile of the location. Reported well yields in the NMOSE database for the water wells in the general area range up to 15 gallons

## **Appendix C – Hydrogeologic Data**

per minute (gpm) for the shallow wells (300 feet or less in depth) and 35 gpm to 75 gpm for the deeper wells completed in the Triassic Dockum or Rustler Formation.

#### Recharge:

Recharge is by direct precipitation and infiltration from intermittent streamflow and subsurface groundwater flow from upgradient areas. The region is characterized by an annual precipitation of 10 to 20 inches and high average annual evaporation rates. Most recharge is episodic and associated with periods of heavy rainfall. Recharge is most likely to occur during long-duration rainfall events or periods of frequent, smaller rainfall events. Otherwise the water is has a high likelihood of being lost to evapotranspiration. The average annual recharge rate for the Pecos River Basin aquifer in the general area (including Lea County) is between 0 and 0.5 inches/year (Hutchison et al., 2011).

#### **References**

Arcadis. 2020. Sand Dunes Development Area Pad 351 Environmental Field Survey. Prepared for Chevron U.S.A. Inc.

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## **Appendix D – Design Plan**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

**Appendix D – Design Plan****Javelina Unit 601 Pit****Temporary Pit**

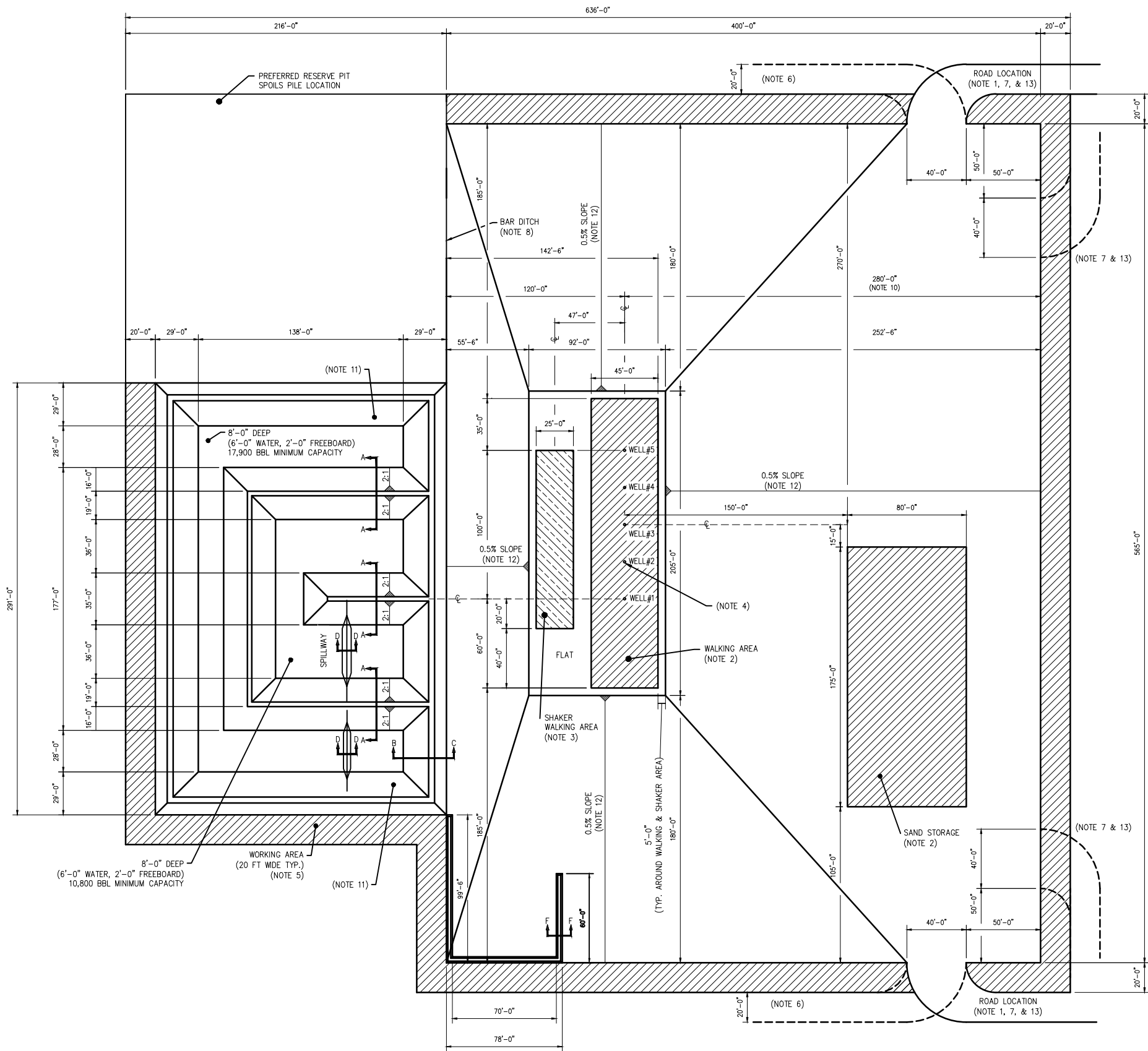
The Operator will design and construct the temporary pit to contain liquids and solids; prevent contamination of fresh water; and protect public health and the environment. The Design and Construction will follow the requirements listed below:

- The topsoil will be stripped and stockpiled prior to construction for use as the final cover during closure.
- A sign, consistent the requirements of 19.15.16.8 NMAC, will be utilized and made viewable at the location of the pit.
- Fencing will be in place around the perimeter of the pits and the Operator will ensure it remains in good repair until closure.
- Netting will not be installed on the temporary pit; however, the operator will inspect for and report any discovery of dead migratory birds or other wildlife while the pit contains fluid and is in use.
- The design of the pit, including the berms, geomembrane material, and construction notes below, is intended to ensure the confinement of liquids to prevent releases.
- The subgrade and interior slopes will be screened for deleterious materials and rocks and will be suitable for the liner installation. An underlying geotextile may be used to provide additional protection from puncture or stress cracking.
- The slopes of the pit will be constructed at a two horizontal to one vertical foot ratio.
- A 40-mil HDPE liner resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions, and ultraviolet light will be installed in the pit. Liner compatibility will comply with EPA SW-846 Method 9090A. Technical data sheets for the liner material can be found in *Variance Request 2 of 2 – Proposed Use of High-Density Polyethylene (HDPE) Liner for Temporary Pit in lieu of Linear Low-Density Polyethylene (LLDPE) Liner*.
- Liner seams will be minimized as is practical during construction and will only be oriented up and down a slope. When field welding the liner seams, the liner will overlap a minimum of 4 inches and a maximum of 6 inches. Welds will be minimized in corners and irregularly shaped area.

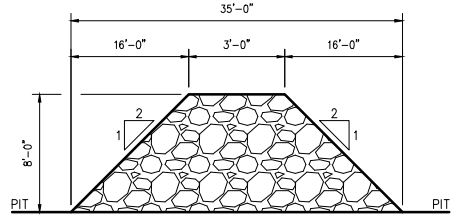


Welds will only be performed by qualified personnel.

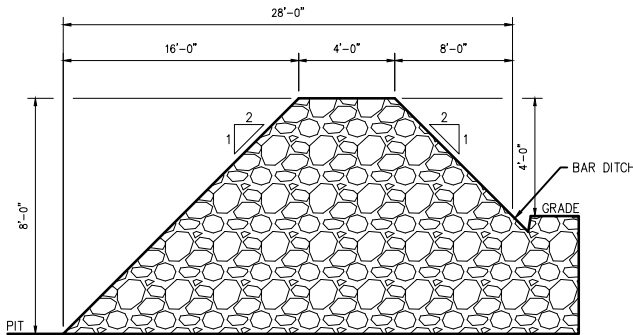
- Construction will avoid excessive stress-strain on the liner by screening the subgrade for deleterious materials and rock and using geotextile where needed, utilized experienced personnel for the installation of the liner, taking care when unrolling liner material and limiting the use of any machinery that could damage the liner.
- The edged of the liner will be anchored in the bottom of a compacted earth field trench that is 18 inches deep.
- Impingement of liquids onto the liner will be prevented by use of a loose hose discharge method. The design ensures fluid enters a malleable section of hose laying on the pit berm prior to entering the pit preventing direct impingement.
- The design includes a 4 foot berm and bar ditch around the entirety of the pit to prevent run onof surface water. The berm will be maintained from construction to closure.
- The volume of the temporary pit is 6.6 acre-ft including freeboard.
- No venting or flaring of gas will take place during the construction, use, and closure of the pit and, as such, the entirety of the pit will be lined.



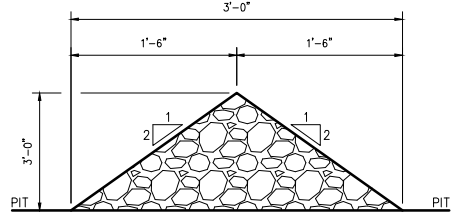
MAGNETIC NORTH



SECTION A-A  
NOT TO SCALE

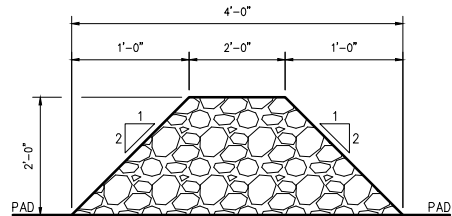


SECTION B-C  
NOT TO SCALE

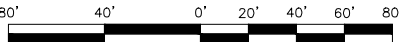


SECTION D-D  
NOT TO SCALE

- NOTES:
1. PRIMARY PAD ENTRANCE MUST BE ON WEST OR EAST SIDE OF PAD FOR DRILLING LAYOUT.
  2. SEE GEO-TECHNICAL INVESTIGATION REPORT FOR COMPACTION RECOMMENDATION. SEE DRILLING MAT LAYOUT FOR DETAILS.
  3. SHAKER WALKING AREA IS REQUIRED WHEN USING NABORS M800 SERIES DRILLING RIG.
  4. FOR COMPLETIONS GRAVEL LOCATIONS, SEE DWG. FACTSTD-COMGRVL-CIV-PVD-MCB-0001-01.
  5. SHADED WORKING AREA IS NOT A PART OF THE PERMITTED PAD. PERMITTED PAD AREA IS 490 FT X 400 FT FOR A 2 WELL PAD. ROAD CAN COME FROM EITHER THE NORTH OR SOUTH DIRECTION DEPENDING ON LEASE ORIENTATION.
  6. DRIVE-THROUGH SECONDARY ACCESS ROAD CAN BE EITHER ON EAST/WEST EDGE OF PAD OR SOUTH EDGE OF PAD, BUT MUST BE OPPOSITE OF PRIMARY PAD ENTRANCE (REF. NOTE 1) FE MUST CONSULT D&C ADVISOR TO COMPLETE PMOC IF SECONDARY ROAD IS NOT FEASIBLE.
  7. 1FT. X 1FT. BAR DITCHING TO BE PROVIDED BETWEEN PAD AND RESERVE PIT. DITCH WILL BE FILLED WITH 1" CLEAN ROCK.
  8. 6 LOADS OF ROCK FOR DRILLING TRAILERS & DITCH COM ROCK DROPPED IN NEW CORNER.
  9. DIMENSION SOUTH OF THE WELLS CAN BE REDUCED TO 260' IF BASIS OF DESIGN IS CONVENTIONAL FRAC OPERATIONS.
  10. PAINT 8" LONG PIT LEVEL MARKERS EVERY 2' FROM THE BOTTOM LABEL BY THE LENGTH OF THE INCLINE FROM THE BOTTOM OF THE PIT.
  11. PREDOMINANT DRAINING DIRECTION TO BE FIELD-DETERMINED BASED ON LOCAL TOPOGRAPHY.
  12. CROSS SECTIONAL PLANE OF ROAD ENTRANCES TO PAD TO HAVE MAXIMUM SLOPING OF 0.5% (E.G. NO MORE THAN 2.4" OF ELEVATION DROP ALONG THE WIDTH OF A 40FT ENTRANCE.)



SECTION F-F  
NOT TO SCALE



SCALE: 1"=40'

SHEET CIV010

REVISIONS									
0	APPROVED FOR CONSTRUCTION BASIN DESIGN, DRF 21103	CSD 04/05/21	EV	CHMT	△				
1	APPROVED FOR CONSTRUCTION BASIN DESIGN, DRF 21252	EV 08/31/21	EB	UGOS	△				
					△				

**AFC**  
APPROVED FOR CONSTRUCTION

**Chevron U.S.A. Inc.**

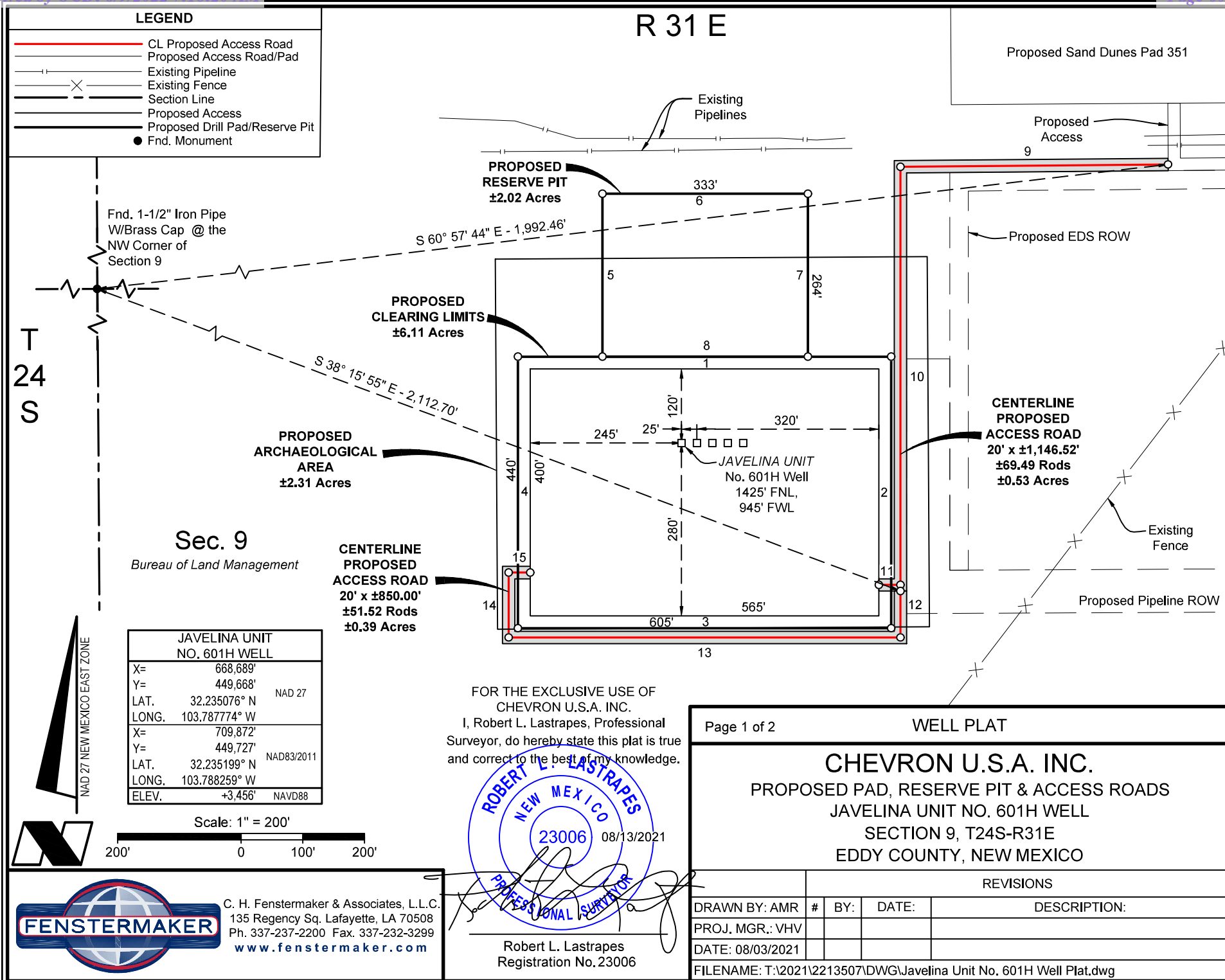
FACTORY STANDARD DRAWINGS  
PROJECT DESCRIPTION — COUNTY, STATE

CIVIL — FACTORY STANDARD 5 WELL PAD PLAN — OPEN LOOP

**FACTSTD-5WPADOPN-CIV-PVD-MCB-0001-01**

DR. JLH  
ENG. KVPY

1



NW PAD CORNER	NE PAD CORNER	NW RESERVE PIT CORNER	NE RESERVE PIT CORNER	NW ARCH AREA CORNER	NE ARCH AREA CORNER
X= 668,424' Y= 449,808' LAT. 32.235464° N LONG. 103.788629° W NAD 27	X= 669,029' Y= 449,808' LAT. 32.235456° N LONG. 103.788672° W NAD 27	X= 668,561' Y= 450,072' LAT. 32.236188° N LONG. 103.788182° W NAD 27	X= 668,894' Y= 450,072' LAT. 32.236184° N LONG. 103.787105° W NAD 27	X= 668,387' Y= 449,966' LAT. 32.235899° N LONG. 103.788745° W NAD 27	X= 669,087' Y= 449,970' LAT. 32.235901° N LONG. 103.788482° W NAD 27
X= 709,607' Y= 449,867' LAT. 32.235588° N LONG. 103.789114° W NAD83/2011	X= 710,212' Y= 449,867' LAT. 32.235579° N LONG. 103.787157° W NAD83/2011	X= 709,744' Y= 450,131' LAT. 32.236311° N LONG. 103.788667° W NAD83/2011	X= 710,077' Y= 450,131' LAT. 32.236307° N LONG. 103.787590° W NAD83/2011	X= 709,571' Y= 450,025' LAT. 32.236022° N LONG. 103.789230° W NAD83/2011	X= 710,271' Y= 450,029' LAT. 32.236024° N LONG. 103.788666° W NAD83/2011
ELEV. +3454' NAVD88	ELEV. +3452' NAVD88	ELEV. +3449' NAVD88	ELEV. +3448' NAVD88	ELEV. +3451' NAVD88	ELEV. +3450' NAVD88
SW PAD CORNER	SE PAD CORNER	SW RESERVE PIT CORNER	SE RESERVE PIT CORNER	SW ARCH AREA CORNER	SE ARCH AREA CORNER
X= 668,424' Y= 449,368' LAT. 32.234255° N LONG. 103.788636° W NAD 27	X= 669,029' Y= 449,368' LAT. 32.234246° N LONG. 103.788680° W NAD 27	X= 668,561' Y= 449,808' LAT. 32.235463° N LONG. 103.788186° W NAD 27	X= 668,894' Y= 449,808' LAT. 32.235458° N LONG. 103.787109° W NAD 27	X= 668,390' Y= 449,366' LAT. 32.234250° N LONG. 103.788744° W NAD 27	X= 669,090' Y= 449,370' LAT. 32.234251° N LONG. 103.788480° W NAD 27
X= 709,607' Y= 449,427' LAT. 32.234378° N LONG. 103.789121° W NAD83/2011	X= 710,212' Y= 449,427' LAT. 32.234370° N LONG. 103.787165° W NAD83/2011	X= 709,744' Y= 449,867' LAT. 32.235586° N LONG. 103.788671° W NAD83/2011	X= 710,077' Y= 449,867' LAT. 32.235581° N LONG. 103.787594° W NAD83/2011	X= 709,574' Y= 449,425' LAT. 32.234373° N LONG. 103.789229° W NAD83/2011	X= 710,274' Y= 449,429' LAT. 32.234375° N LONG. 103.788665° W NAD83/2011
ELEV. +3461' NAVD88	ELEV. +3460' NAVD88	ELEV. +3453' NAVD88	ELEV. +3453' NAVD88	ELEV. +3461' NAVD88	ELEV. +3457' NAVD88

**NOTE:**

Please be advised, that while reasonable efforts are made to locate and verify pipelines and anomalies using our standard pipeline locating equipment, it is impossible to be 100 % effective. As such, we advise using caution when performing work as there is a possibility that pipelines and other hazards, such as fiber optic cables, PVC pipelines, etc. may exist undetected on site.

**NOTE:**

Many states maintain information centers that establish links between those who dig (excavators) and those who own and operate underground facilities (operators). It is advisable and in most states, law, for the contractor to contact the center for assistance in locating and marking underground utilities. For guidance, New Mexico One Call [www.nm811.org](http://www.nm811.org)

**DISCLAIMER:** At this time, C. H. Fenstermaker & Associates, L.L.C. has not performed nor was asked to perform any type of engineering, hydrological modeling, flood plain, or "No Rise" certification analyses, including but not limited to determining whether the project will impact flood hazards in connection with federal/FEMA, state, and/or local laws, ordinances and regulations. Accordingly, Fenstermaker makes no warranty or representation of any kind as to the foregoing issues, and persons or entities using this information shall do so at their own risk.



C. H. Fenstermaker & Associates, L.L.C.  
135 Regency Sq. Lafayette, LA 70508  
Ph. 337-237-2200 Fax. 337-232-3299  
[www.fenstermaker.com](http://www.fenstermaker.com)

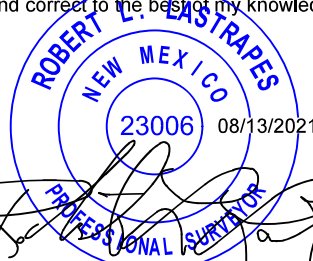
CENTERLINE PROPOSED ACCESS ROAD		
COURSE	BEARING	DISTANCE
9	S 89° 30' 01" W	433.62'
10	SOUTH	677.90'
11	WEST	35.00'

CENTERLINE PROPOSED ACCESS ROAD		
COURSE	BEARING	DISTANCE
12	SOUTH	75.00'
13	WEST	635.00'
14	NORTH	105.00'
15	EAST	35.00'

PROPOSED CLEARING LIMITS		
COURSE	BEARING	DISTANCE
1	EAST	605.00'
2	SOUTH	440.00'
3	WEST	605.00'
4	NORTH	440.00'

PROPOSED RESERVE PIT		
COURSE	BEARING	DISTANCE
5	NORTH	264.00'
6	EAST	333.00'
7	SOUTH	264.00'
8	WEST	333.00'

FOR THE EXCLUSIVE USE OF  
CHEVRON U.S.A. INC.  
I, Robert L. Lastrapes, Professional  
Surveyor, do hereby state this plat is true  
and correct to the best of my knowledge.



Robert L. Lastrapes  
Registration No. 23006

Page 2 of 2

**WELL PLAT**

**CHEVRON U.S.A. INC.**  
PROPOSED PAD, RESERVE PIT & ACCESS ROADS  
JAVELINA UNIT NO. 601H WELL  
SECTION 9, T24S-R31E  
EDDY COUNTY, NEW MEXICO

REVISIONS				
DRAWN BY: AMR	#	BY:	DATE:	DESCRIPTION:
PROJ. MGR.: VHV				
DATE: 08/03/2021				
FILENAME: T:\2021\2213507\DWG\Javelina Unit No. 601H Well Plat.dwg				

## **Appendix E – Operating and Maintenance Plan**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

## **Appendix E – Operating and Maintenance Plan**

### **Javelina Unit 601 (601H, 602H, 603H, 501H, 502H)**

#### **Temporary Pit**

The Operator and Rig Contractor will operate and maintain the Temporary Pit to contain liquids and solids, maintain the integrity of the liner system in a manner that prevents contamination of fresh water and protects public health and the environment as described below.

The operation of the Temporary Pit is summarized below.

Prior to arrival of the drilling rig, the separate pit sections are filled with the fluid required for drilling operations of the wells on the well pad. Typically, these fluids are a low chloride brackish water and a high chloride saturated brine.

During open loop drilling operations, fluid is pulled from one end of the Temporary Pit and sent to the rig pumps to be transferred downhole as the drilling fluid. Upon returning to the surface, the fluid and associated drilled solids flow to the opposite end of the Temporary Pit.

When conducting Closed Loop drilling activities, the Temporary Pit may be utilized for cuttings disposal for purposes of maintaining mud weight, mitigating downhole hazards, and managing other unforeseen circumstances. The Temporary Pit is only to be utilized in conjunction with Closed Loop drilling when drilling activities are done using Water Based Drilling Fluids. In this circumstance, drilled solids are separated from the drilling fluid with solids control equipment and then moved to the Temporary Pit.

During well cementing operations, if the low chloride fluid in the Temporary Pit meets specifications set by the Operator and Cementing Contractor, that fluid will be used as mix water for the blending of the cement slurry. During cementing operations, excess cement returns may be placed in the Temporary Pit.

Throughout well construction, if the fluid in the Temporary Pit meets the specifications set by the Operator and Rig Contractor, that fluid may be used as rig water for component cleaning and engine cooling.

If downhole problems occur during drilling operations, such as fluid losses or waterflows, the Temporary Pit is used to assist with fluid management into and out of the well. Transfer pumps and hoses are used to move these fluids.

After the drilling rig is mobilized off the well pad, any remaining fluids in the Temporary Pit will be removed and reused, recycled, or disposed of in a manner consistent with Division rules.

The operation of the Temporary Pit will follow the requirements listed below:

- All cuttings placed into the Temporary Pit will be produced and disposed of within the boundaries of one single lease, pursuant to the Pit Rule definition of “Onsite”.
- The Operator will not discharge into or store any hazardous waste (as defined by 40 CFR 261 and NMAC 19.15.2.7.H.3) in the pits.
- If the pit liner’s integrity is compromised above the water line, then the Operator will repair the damage within 48 hours of discovery.
- If the pit develops a leak, or if any penetration of the pit liner occurs below the liquid’s surface, then the Operator shall notify the appropriate division office pursuant to the requirements of 19.15.29 NMAC, remove all liquid above the damage or leak within 48 hours of discovery, and repair the damage or replace the pit liner as applicable.
- The injection or withdrawal of liquids from a pit is accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
- Engineering drawings demonstrate that the elevation and slopes of the pit prevent the collection of surface water run-on.
- The Operator will maintain on site an oil absorbent boom to contain and remove oil from the pit’s surface.
- The Operator will maintain the pit free of miscellaneous solid waste or debris.
- The Operator will maintain at least two feet of freeboard for the Temporary Pit. If, during extenuating circumstances, a freeboard of less than two feet is required, then a log will be maintained describing such circumstances.
- The Operator will remove all free liquids from the surface of a temporary pit within 30 days from the date the Operator releases the last drilling or workover rig associated with the relevant pit permit. The Operator will note the date of the drilling or workover rig’s release on form C-105 or C-103 upon well or workover completion.



## **Appendix F – Closure Plan**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

## **Appendix F – Closure Plan Javelina Unit 601 (601H, 602H, 603H, 501H, 502H) Temporary Pit**

### **Discussion of Onsite Cuttings Disposal**

The proposed Temporary Pit will contain drill cuttings from the vertical sections of wells 601H, 602H, 603H, 501H, and 502H. All cutting from vertical drilling will be produced and disposed of within the boundaries of one single lease, pursuant to the Pit Rule definition of “Onsite”. The disposal and closure activities will take place within the design footprint of the Temporary Pit. Proposed closure operations will be conducted in accordance with the Closure and Site Reclamation Requirements detailed in 19.15.17.13 NMAC.

### **Closure Notice**

If planned activities deviate from this Closure Plan, an updated Closure Plan will be submitted to the Division for approval prior to initiating any closure activities.

The Operator will notify the Bureau of Land Management at least 72 hours, but not more than one week, prior to any closure activities as per approved sundry Conditions of Approval. This notice will include the project name and location description.

The Operator shall additionally notify the district office verbally and in writing at least 72 hours, but not more than one week, prior to any closure operation. This noticed will include the Operator’s name and the location to be closed by unit letter, section, township, and range.

### **Protocols and Procedures**

1. The Operator will remove all liquids from the Temporary Pit and either:
  - a. Dispose of the liquids in a division-approved facility,  
or
  - b. Recycle, reuse or reclaim the water for reuse in drilling and stimulation.
2. A five-point (minimum) composite sample will be collected from the contents of the Temporary Pit and sent to an accredited laboratory for analysis of the constituents listed in Table 2 of 19.15.17.13 NMAC.
  - a. If any concentration is higher than limits listed in Table 2, blending calculations will be used to determine the amount of soil or non-waste material needed to blend with the pit contents to achieve the Table 2 limit. The mixing ratio of soil or non-waste material to pit contents shall not exceed 3:1.
  - b. If all constituent concentrations are less than or equal to the parameters listed in Table 2 of 19.15.17.13 NMAC, no mixing shall occur.

3. The Operator will conduct blending operations, as required, and conduct a paint filter liquids test to ensure that the contents of the former pit are sufficiently stabilized to support the cover materials.
4. Cover materials will be installed as described in 'Cover Design' (below).
5. Following the implementation of the cover design, the Operator will revegetate the area as outlined in 'Reclamation and Revegetation' (below).

## Soil Cover Design

After blending with non-waste containing, uncontaminated, earthen material, the Operator will cover the former Temporary Pit according to the following procedure.

1. The contents of the former pit will be positively contoured ('turtle-backed') to promote drainage away from the former pit contents and reduce infiltration. Compaction of pit materials over time and as a result of placement of overburden will be taken into consideration.
2. A 20-mil string reinforced LLDPE geomembrane liner will be installed above the pit materials.
3. At least 4-feet of compacted, uncontaminated, non-waste containing earthen fill with chloride concentrations less than 600 mg/kg will be placed above the liner.
4. Either the background thickness of topsoil or 1-foot of suitable material to establish vegetation at the site, whichever is greater, will be placed over the earthen fill.
5. The location will be recontoured to match the pre-disturbance topography and prevent surface erosion and ponding.
6. The Operator will revegetate the area as described below in 'Reclamation and Revegetation'.

## Closure Report

1. Within 60 days of closure completion, the Operator will submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results, information required by 19.15.17 NMAC, a plot plan including the exact location of the former pit, details of the cover design, and photographs.
2. In the closure report, the Operator will certify that all information in the report and attachments is correct and that the Operator has complied with all applicable closure requirements and conditions specified in the approved closure plan.
3. A steel marker will be placed at the location per the requirements in Subsection F of 19.15.17.13 NMAC.

## Closure Timing

As discussed in **Variance 1**, the Operator proposes closure activities will be completed within a timeline not to exceed 1 year from the rig down move out (RDMO) date. This date will be noted on form C-105 or C-103, filed with the Division upon the well's completion.

## Reclamation and Revegetation

The Operator will reclaim the disturbed area to a safe and stable condition that existed prior to oil and gas operations and that blends with the surrounding undisturbed area. Areas with ongoing production or drilling operations will not be reclaimed as described herein, but will be stabilized and maintained to minimize dust and erosion

For all areas relevant to the closure process that will not be used for production operations or future drilling, the Operator will:

1. Replace topsoils and subsoils to their original relative positions and regrade the area to achieve erosion control, long-term stability, preservation of surface water flow patterns, and prevent ponding.
2. Notify the Division when the surface grading work is complete.
3. Reseed the area with an appropriate seed mix in the first favorable growing season following closure. Reseeding and weed control measures will be taken, if necessary.
4. Notify the Division when reclamation is complete: vegetative cover has been established that reflects a life-form ratio of plus or minus 50 % of pre-disturbance levels and a total percent plant cover of at least 70 % of pre-disturbance levels, excluding noxious weeds.

## Alternative to Closure in Place

In the event the concentration of any contaminant in the contents, after mixing with soil or non-waste material, is higher than constituent concentrations shown in 19.15.17.13 NMAC, then the waste shall be removed from the Temporary Pit and disposed of at one of the following Division approved off-site facilities.

Sundance Services (Parabo, Inc.)  
M-29-21S-38E  
Permit No. NM-01-003

R360 Permian Basin, LLC  
4507 W. Carlsbad Hwy, Hobbs, NM 88240  
Permit No. NM-01-0006

## **Appendix G – Evaluation of Unstable Conditions**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

## Appendix G – Evaluation of Unstable Conditions Sand Dunes 601 Temporary Pit

### Summary

**Figure 8** identifies the location of the proposed temporary pit with respect to Bureau of Land Management (BLM) mapped potential karst areas. The BLM categorizes all areas within the Carlsbad Field Office (CFO) as having either low, medium, high or critical cave potential based on geology, occurrence of known caves, density of karst features, and potential impacts to fresh water aquifers. The proposed Temporary Pit is mapped by BLM CFO in a “Low Potential” karst area.

The proposed Temporary Pit lies near the northeast margin of the Delaware Basin. Bedrock cropping out beneath the proposed project area is comprised of the Triassic-aged Dockum Group. Underlying the Dockum Group are the Dewey Lake redbeds. Both of these formations are composed chiefly of clastic (insoluble), non-karst-forming rocks. Beneath these formations are Permian-aged rocks of the Rustler and Salado Formations. These rocks contain significant beds of halite (i.e., rock salt) and anhydrite, making them susceptible to karst formation. The top of the Rustler Formation in the proposed project area is approximately 800 feet below the land surface (Crowl et al. 2011). Local karst potential is likely to be low. The following lines of evidence, detailed in the sections below, support this position:

1. There are no dissolution features within 5-miles of the proposed location (**Figure 11**),
2. An Arcadis field study of the area indicated no closed depressions, caves, or fissures in the immediate vicinity and general area of the proposed pit (**Attachment 1**),
3. Tetra Tech geotechnical report and boring log from the proposed two recycled water storage ponds site location did not indicate any karst potential (**Attachment 2**),
4. The Bureau of Land Management, Carlsbad Field Office prepared the Environmental Assessment (EA), document number - DOI-BLM-NM-2020-0972-EA, evaluating MarkWest Energy West Texas Gas Col., LLC. This EA did not identify karst as an issue that needed evaluation (**Attachment 3**).

Structurally, the region surrounding the proposed pit location is relatively undeformed, with a 0 to 3 percent slope, and the nearest mapped fault is 22-miles to the southwest (**USGS 2022**).

### Dissolution Features Evident on Aerial Imagery

The nearest apparent dissolution features to the proposed location are (**Figure 11**):

- ~15 miles southeast of the proposed pit location is an area with small (<500-feet



in diameter) depressions.

- Bell Lake Sink and three other unnamed sinks, each ~2-miles in diameter, are present approximately 12-miles east of the proposed location.
- San Ramon Sink are present ~16-miles northeast of the proposed location.

### Depth to Karst-Forming rocks

**Figure G.1** shows a stratigraphic section of the formations beneath the proposed pit. The upper 1,000-feet of subsurface consists of insoluble, clastic material. These deposits are underlain by soluble, karst-forming strata.

Surface to ~1,000-feet: Based on a review of available literature for the region, no significant intervals of soluble rocks are present in the Quaternary and Triassic deposits that constitute the upper ~1,000-feet of subsurface. Because this material is largely insoluble, the potential for karst features to form within this interval is very low (Lucas and Anderson, 1993). Deeper formations at >1,000-feet: The top of the Rustler Formation is approximately 400 feet thick beneath the surface at the location of the proposed pit (Nicholson and Clebsch 1961). The Rustler Formation overlies the Salado Formation. These formations both contain thick, highly soluble beds of anhydrite and halite. The Bell Lake Sink, San Simon Swale, and San Simon Sink formed by the dissolution of salt from these deep formations. The resulting surface subsidence (as a result of deep dissolution) is a very slow process that has been ongoing for millions of years to form these large depressions (Bachman, 1973 and Berg, 2012).

<b>Period</b>	<b>Formation</b>	<b>Thickness (ft)</b>		<b>Description</b>
<i>Quaternary</i>		<i>100</i>		<i>Unconsolidated eolian and unconsolidated to partially consolidated alluvial deposits</i>
<i>Triassic</i>	<i>Chinle</i>	<i>200</i>		<i>Red shales and thinly interbedded sandstone</i>
	<i>Santa Rosa</i>	<i>200 - 300</i>		<i>Sandstone and interbedded siltstone and red shale</i>
<i>Permotriassic</i>	<i>Quartermaster (Dewey Lake)</i>	<i>560</i>		<i>Mudstone, siltstone, claystone, and interbedded sandstone</i>
<i>Permian</i>	<i>Rustler</i>	<i>400</i>		<i>Anhydrite, halite, dolomite, sandy siltstone, and polyhalite</i>

*Figure G.1: Stratigraphic section beneath the location of the proposed temporary pit (Nicholson and Clebsch 1961 as cited in Arcadis 2018)*

### Arcadis Environmental Field Survey

An environmental field survey was conducted by Arcadis in February 2020 in the area surrounding the location of the proposed pit (**Attachment 1**). The on-site survey did not

identify any closed depressions, caves, or fissures. No evidence of depressions in the survey area were identified through desktop review or field survey.

### **TetraTech Geotechnical Reports and Boring Logs**

Geotechnical reports from 2018 for two recycle water storage ponds were reviewed (**Attachment 2**). The recycle water storage ponds are located <1 mile-away and in an almost identical geomorphological and geological setting as the proposed pit location. The five borings were drilled from 30 feet to 80 feet below ground surface. Water was not encountered in any of the borings during or immediately after drilling. All borings encountered silty to clayey sand, clayey gravel, and low plasticity clay.

- Sand Dunes Recycle Water Storage Ponds Site
  - 1 miles northwest of proposed pit location
  - Boring B1 was drilled to 80 ft
  - Borings B2 through B5 were drilled to 30 ft
  - 1.5 ft to 3.5 ft
    - 6 – 10 blows per foot (bpf)
    - Loose sand with silt
  - 3.5 ft to 80 ft
    - 14 – 100+ bpf
    - Medium dense to very dense clay
  - Groundwater was not encountered at the time of drilling and borings were dry 24 hours after drilling.

### **Mitigation of Karst Potential**

Not applicable; however, the following commitments will be applied as a best practice in development of the proposed pit.

#### General Construction:

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features, if they are identified during construction, to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche –no blasting.
- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
- Following a rain event, all fluids will be vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

## References

Arcadis 2020. Sand Dunes Development Area Pad 351 Final Environmental Field Survey Report. Prepared for Chevron U.S.A, Inc.

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Stafford, Kevin W., Laura Rosales-Lagarde, and Penelope J. Boston. 2008. Castile evaporite karst potential map of the Gypsum Plain, Eddy County, New Mexico and Culberson County, Texas: A GIS methodological comparison. Journal of Cave and Karst Studies 70 (1): 35-46.

U.S. Geological Survey (USGS) 2022. New Mexico Faults, from the USGS Geologic Map Database. Available online at <https://my.usgs.gov/eerma/data/index/4f4e496ee4b07f02db5a354e>

### **Attachments 1 - 3**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

#### Attachment 1

Arcadis Environmental Field Survey, P351, Karst Evaluation, Sand Dunes (2020)

#### Attachment 2

Tetra Tech Geotechnical Study Report, Section 11, Sand Dunes (2018)

#### Attachment 3

DOI-BLM-NM-2020-0972-EA, Section 1.6, Scoping, Public Involvement, and Issues (2020)

**Attachments 1 – Arcadis Environmental Field Survey, P351, Karst Evaluation, Sand Dunes (2020)**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E





Chevron U.S.A. Inc.

## ENVIRONMENTAL FIELD SURVEY

Sand Dunes Development Area

Pad 351

February 2020

## ENVIRONMENTAL FIELD SURVEY

## ENVIRONMENTAL FIELD SURVEY

### Sand Dunes Development Area

Prepared for:  
Tony Vallejo  
HES Specialist  
Chevron U.S.A. Inc.  
6301 Deauville Boulevard  
Midland, Texas 79706

Prepared by:  
Arcadis U.S., Inc.  
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Midland  
Texas 79701  
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Our Ref.:  
30045964

Date:  
February 2020

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## ENVIRONMENTAL FIELD SURVEY

## 10 KARST

The term karst describes distinct terranes that are attributable to high solubility of underlying bedrock. Common features of such terranes include sinkholes and caves, which are formed as the bedrock is dissolved by groundwater. Karst aquifers represent saturated bedrock where its permeability has been enhanced by dissolution processes. Such aquifers can be important sources of potable groundwater.

The proposed project area lies near the northeast margin of the Delaware Basin. As discussed in further detail in Section 11.2, bedrock cropping out beneath the proposed project area consists of the Triassic-aged Dockum Group. Underlying the Dockum Group are the Dewey Lake redbeds. Both of these formations are composed chiefly of clastic (insoluble), non-karst-forming rocks. Beneath these formations are Permian-aged rocks of the Rustler and Salado Formations. These rocks contain significant beds of halite (i.e., rock salt) and anhydrite, making them susceptible to karst formation. The top of the Rustler Formation in the proposed project area is approximately 800 feet below the land surface (Crowl et al. 2011).

Despite the great depth to karst-forming rocks, a number of large depressions and “sinks” are noted in the region. Bell Lake Sink and three other unnamed sinks, each about two miles in diameter, occur approximately 15 miles north of the project area (Berg 2012). San Simon Swale, an approximately 18 mile long by 6 mile wide closed depression that terminates at San Simon Sink is located approximately 20 miles northeast of the project area (Bachman 1973, Berg 2012). Using Google Earth Imagery (dated 11/20/2015), the dimensions of San Simon Sink are approximately one mile long by one-half mile wide by 75 feet deep. These depressions formed by the dissolution of salt from the upper part of the Salado Formation as well as from the overlying Rustler Formation (Bachman 1973). Solution subsidence in San Simon Swale has been active within the past century; however, solution and subsidence in this area of southeastern New Mexico has been ongoing for millions of years (Bachman 1973).

In summary, evidence of karst in the region consists predominantly of large depressions that likely formed over millions of years; although there is evidence that subsidence is ongoing, at least at San Simon Sink. These depressions were created by the dissolution of salt beds in the upper part of the Salado Formation and in the Rustler Formation, even though these are overlain by approximately 800 feet of insoluble rocks. No evidence of depressions in the survey area were identified on available topographic mapping or by examining recent Google Earth imagery.

### 10.1 Survey Findings and Mitigation

Karst potential is mapped by the BLM as “low” in the survey area (**Figure 10**) and no potential karst features were observed during the survey. Therefore, no mitigation is recommended.








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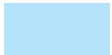


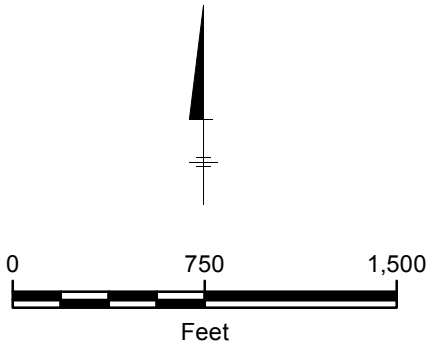
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

## LEGEND

-  Proposed Survey Area
-  Previous Survey Area (April, 2019)
-  Townships
-  Sections
-  Eddy County Roads

## SURFACE OWNERSHIP

-  Bureau of Land Management
-  State



CHEVRON U.S.A. INC.  
ENVIRONMENTAL FIELD SURVEYS  
SAND DUNES DEVELOPMENT AREA  
EDDY COUNTY, NEW MEXICO

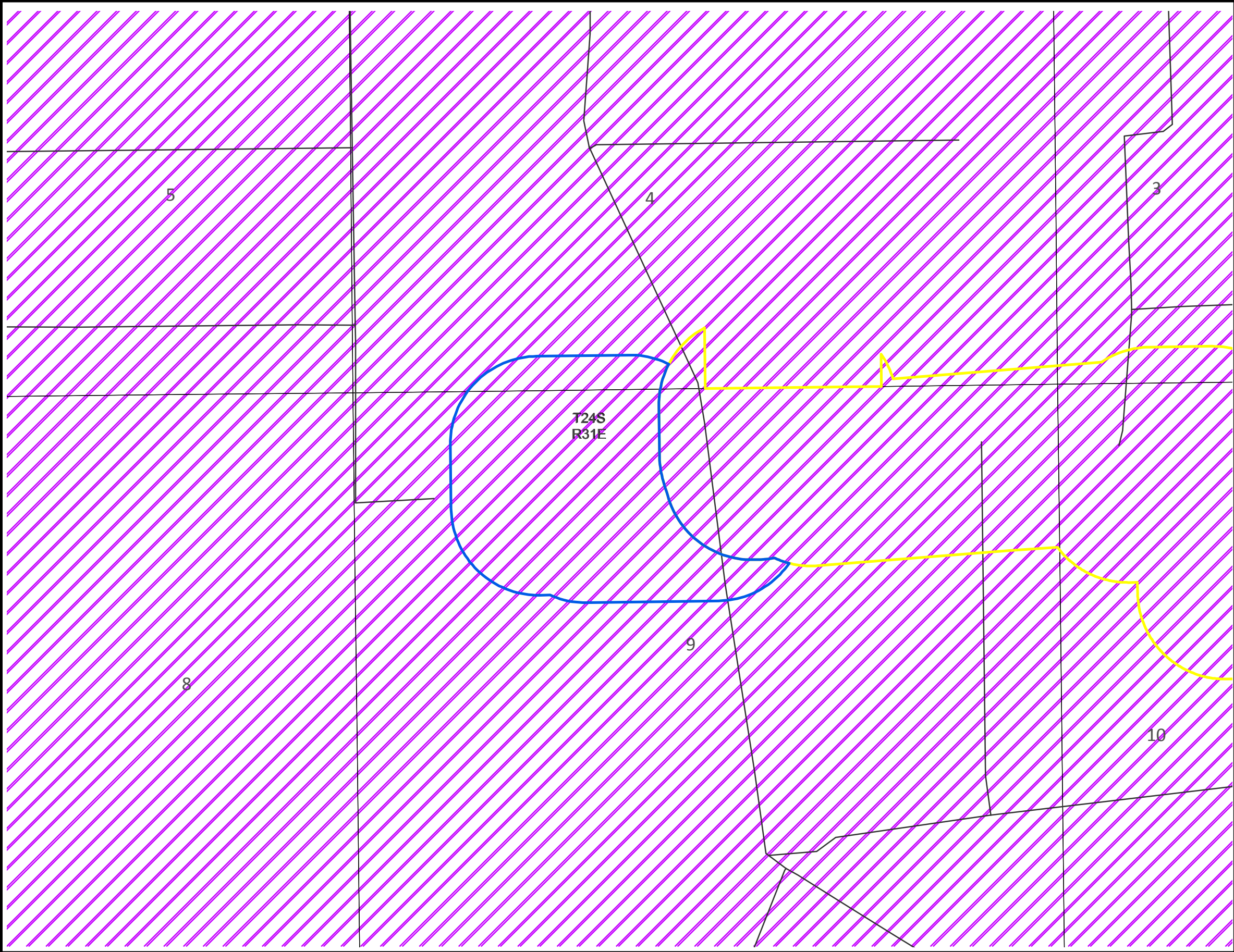
## ENVIRONMENTAL FIELD SURVEY AREA









FIGURE  
2

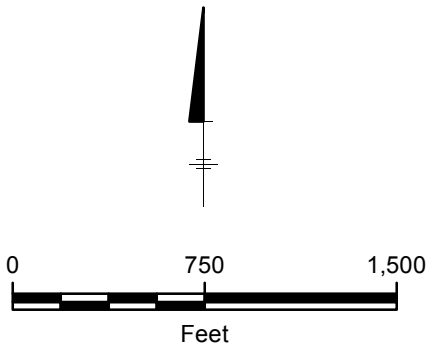


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**LEGEND**

-  Proposed Survey Area
-  Previous Survey Area (April, 2019)
-  Townships
-  Sections
-  Low Potential Karst
-  Eddy County Roads



CHEVRON U.S.A. INC.  
ENVIRONMENTAL FIELD SURVEYS  
SAND DUNES DEVELOPMENT AREA  
EDDY COUNTY, NEW MEXICO

**KARST POTENTIAL ZONES**



FIGURE  
**10**

# APPENDIX A

## Resumes



## PERSONNEL RESUME



# CHARLES G. HOLDER

## BIOLOGIST

**EDUCATION**

BS Wildlife & Fisheries Science 2014  
Texas A&M University

**YEARS OF EXPERIENCE**

Total – 4  
With Arcadis – 1

**CORE SKILLS**

1. Wildlife ID and Trapping
2. Plant ID
3. Optical Gas Imaging Certified
4. ACOE Wetland Delineation Training

Mr Holder is a wildlife biologist with experience in university research, wind energy, and nuisance wildlife removal. As a university researcher, he has experience with trapping, banding, and radio collaring birds, as well as using radio telemetry to track birds. He has experience in pre-construction projects, surveying potential turbine sites for nests and raptor activity, and mortality monitoring on post construction wind farms, as well as acting as the bias corrections coordinator on the project. He also has experience trapping wildlife in residential settings.

### Project Experience

#### Field Surveys for Oil and Gas Development Production Expansion

**Confidential Client, Lea and Eddy County, New Mexico**

Conducted multiple field surveys for proposed oil and gas development projects in Lea and Eddy County New Mexico. Documented wildlife, vegetation, hydrology, and multiple other applicable resources to assist in identification of potential design constraints and to support the National Environmental Policy Act documentation.

#### Barn Owl Nest Monitoring

**Confidential Client, Eddy County, New Mexico**

Monitored an active barn owl nest during construction. Worked with the construction crew to modify working practices in an effort to prevent the female from abandoning the nest. Construction occurred extremely close to the nest but the project was ultimately successful.

#### Scheer's Beehive Cactus Survey

**Confidential Client, Eddy County, New Mexico**

Assisted with four surveys for the Bureau of Land Management special status plant, Scheer's Beehive Cactus. During the surveys, one Scheer's Beehive Cactus was documented and observed multiple look alike species.

#### Gypsum Milkvetch Survey

**Confidential Client, Eddy County, New Mexico**

Assisted with one survey for the Bureau of Land Management special status plant, Gypsum Milkvetch. No Gypsum Milkvetch was found during the survey.

## PERSONNEL RESUME – Charles G. Holder

## Project Experience Continued

**Pre-construction Nest Clearance  
Confidential Client 2019.**

Conducted pre-construction nest clearing surveys for oil and gas development in Eddy and Lea counties NM. Nests were found systematically walking transects, the nests were identified as active or inactive, and all inactive nests were removed to discourage nesting activity prior to construction. Active nests and all raptor's nests were monitored on a weekly basis until construction was complete.

**Hayhusrt Geophysical Investigation  
Confidential Client 2019.**

Assisted in geophysical surveys by helping set up Electrical Resistivity Imaging (ERI) lines in order to determine the location of bedrock fracture zones and/or delineating tunnels and cavernous zones.

**Attwater's Prairie Chicken Nutrition Study  
Texas A&M University.**

Conducted a study on radioactive isotopes in the Attwater's Prairie Chicken diet. Gathered plant and insect samples in the field, and processed samples for isotope analysis using a ball-and-cup grinder.

**Pre-construction Pad Surveys  
Tetra Tech Inc. 2017.**

Conducted pre-construction transmission line and turbine pad surveys for a windfarm project. Assisted biologist in identifying bird nests in the path of construction equipment, as well as monitor raptor nests when construction equipment is in vicinity.

**Post-construction Mortality Surveys  
Tetra Tech Inc. 2016-2017.**

As Field Crew leader, conducted post construction bird and bat mortality monitoring surveys on a newly constructed wind farm in Texas. Also acted as "Bias-corrections Coordinator" and conducted searcher efficiency trials as well as carcass persistence trials.  
Multiple Studies on the Decline of Quail Populations

**Multiple Studies  
Texas Tech University, Wildlife Toxicology Laboratory. 2015.**

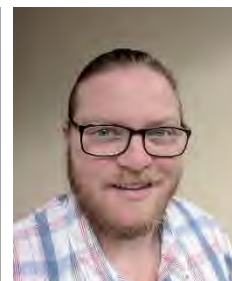
Conducted field research for multiple studies on the decline of quail populations. Responsible for animal-friendly trapping, handling, and tracking of birds. Performed sage and accurate dissections both in the field and lab.

**Multiple Studies  
Texas Tech University, Wildlife Toxicology Laboratory. 2015.**

- Study of Survival Rates and Female Nest Success using Radio Telemetry
- Study of Eye Worms and Caecal Worms in Hunter-harvested Quail
- Study of Eye Worms and Caecal Worms in Grasshoppers

# CHARLESTON SHIRLEY

## ENVIRONMENTAL SCIENTIST I, BIOLOGIST



### EDUCATION

BS Natural Resource Management  
Louisiana State University and  
Agricultural & Mechanical College  
2013

### YEARS OF EXPERIENCE

Total – 4 years  
With Arcadis – <1 year

Mr. Shirley has more than two years of experience in the consulting field. He specializes in conducting surveys and monitoring of flora and fauna with an emphasis on threatened species, endangered species and species of concern. Previously he has worked with the military, public agencies and private landowners. He is an authorized biologist with the desert tortoise, *Gopherus agassizii*.

### Project Experience

#### Ongoing Maintenance Activities on Pipeline System in the Southern California Deserts

##### SoCal Gas Company, Southern California Desert Areas

As an authorized biologist, monitored sites for wildlife and environmental compliance as excavation, pipe removal and replacement occurred. Performed pre-construction clearance surveys for flora and fauna.

#### Development Project

##### Confidential Client, Coyote Springs, Nevada

As an authorized biologist, conducted radio telemetry tracking of transmittered tortoises. Handled tortoises and collected body metrics and replaced transmitters on all tortoises. Monitored sites as crews worked in sensitive wildlife areas.

#### Water Treatment Installation

##### Tetra Tech, Henderson, Nevada

Performed inspection on all tortoise prevention devices. Checked site for compliance.

#### Range-wide Monitoring Program

##### U.S. Fish and Wildlife Service, Nevada, California and Utah

As an authorized biologist, tracked all transmittered tortoises, removed transmitters from all individuals being removed from project study, and managed data entry for submission to USFWS.

#### Community Solar Project

##### Valley Electric Association, Pahrump, Nevada

Monitored areas of construction for flora and fauna in ecologically sensitive areas during transmission line maintenance.

**Monitoring Avian Productivity and Survivorship (MAPS) Banding**  
**Louisiana Department of Wildlife and Fisheries and Institute for Bird Populations, Louisiana**

Safely and quickly extracted birds from mist nets. Determined age and sex of passerine and non-passerine birds. Took body metrics including mass, wing cord and reproductive status.

**Gopher Tortoise Health Assessment**  
**Louisiana Department of Wildlife and Fisheries, Louisiana**

Assisted with collection and processing of bodily fluids of gopher tortoise. Managed live traps and handling of tortoises.

**Inventory of Recently Purchased Lands**  
**U.S. Department of Defense, Fort Polk, Louisiana**

Conducted an inventory of wildlife and habitat types on lands recently acquired by the military. Worked closely with representatives of the client during active military training to assess health and condition of the endangered red-cockaded woodpecker. Marked areas of clearcutting and suggested other forms of habitat management. Completed indices for diatoms found in flowing water bodies.

**Wildlife Mortality Study**  
**Invenergy, Bishop Hill, Illinois**

Served as acting assistant field crew supervisor. Managed establishment and maintenance of transect plots on private lands. Worked with the client and private land owners to conduct a wildlife mortality study. Conducted placement trials and carcass removal trials.



**Attachments 2 – Tetra Tech Geotechnical Study Report, Section 11,  
Sand Dunes (2018)**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E



**TETRA TECH**

**Chevron North America - MCBU, Sand Dunes Site**

**Proposed Two Recycled Water Storage Ponds**

**Section 11, Township 24 South,  
Range 31 East,  
Eddy County, New Mexico**

**June 2018**

complex world

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## Report of Geotechnical Study

### Sand Dunes Impoundments

### Eddy County, New Mexico

*Prepared for:*

**Mr. Caleb Weaver**

**Chevron North America – MCBU**

**Exploration and Production Company**

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Phone: (432) 687-7258

*Prepared by:*

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Phone (432) 682-4559; Fax (432) 682-3946

Tetra Tech Project No. 212C-MN-01180

Thomas A. Chapel, CPG, PE  
Principal Engineer



Reviewed by: Don Grahlherr,  
P.E. Vice President  
June 1, 2018

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

Chevron North America- MCBU

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## EXECUTIVE SUMMARY

Chevron North America Exploration and Production Company (Chevron) plans to construct two water storage ponds (or impoundments) at their “Sand Dunes” site located in Eddy County, New Mexico. The two water storage ponds (ponds) will measure approximately 700 feet long by 340 feet wide with a maximum depth of approximately fifteen feet and total combined capacity of approximately 630,000 barrels (bbl) with three feet of freeboard.

The purpose of this study was to obtain information on subsurface conditions and to provide geotechnical design recommendations for the construction of the two proposed ponds. The general site location is shown on the Site Location Map (Figure 1) and Topographic Map (Figure 2).

Between April 3<sup>rd</sup> and 5<sup>th</sup>, 2018, Tetra Tech and our drilling subcontractor drilled five (5) exploratory soil borings to identify subsurface conditions and collect samples. Borings were drilled to depths ranging from 30 feet to 80 feet below the existing ground surface (bgs). Water was not encountered in any of the borings during or immediately after drilling. The boreholes were backfilled with the excavated soils following completion of drilling. Approximate locations of the borings are shown in Figure 3.

The borings encountered silty to clayey sand, clayey gravel, and low plasticity clay. Slight cementation of soils was observed at various depths, as described in the report.

Mapping by the Natural Resources Conservation Service (NRCS, 2016) identifies the site soils as the Berino and Tonuco mapping units (Figure 4). These soils are both described as fine sands. Review of mapping by the U.S. Geological Survey (Figure 5) indicates that the eolian and alluvial deposits cover entirely the project site. Typically these deposits are a distinctive reddish-brown color and soils are weakly developed. Eolian sediments consist of wind-deposited sand and silt, augmented and modified by alluvial processes.

Our investigation found that subsurface conditions are generally favorable for construction of lined earthen storage ponds at this location. The primary geotechnical concerns are collapsing soils at shallow depths, potentially soft or yielding soils that may develop during construction, and portions of the pond footprint that are underlain by hard, cemented soil/rock lenses.

Additional investigation and construction recommendations to mitigate the concerns for the development of the site are provided in the body of this report.

We have prepared this executive summary solely to provide a general overview, and it should not be used for any purpose except that for which it was intended. We recommend detailed review of the entire report for information about our findings, recommendations and other concerns related to geotechnical conditions for the site.

## 1.0 PURPOSE AND SCOPE OF STUDY

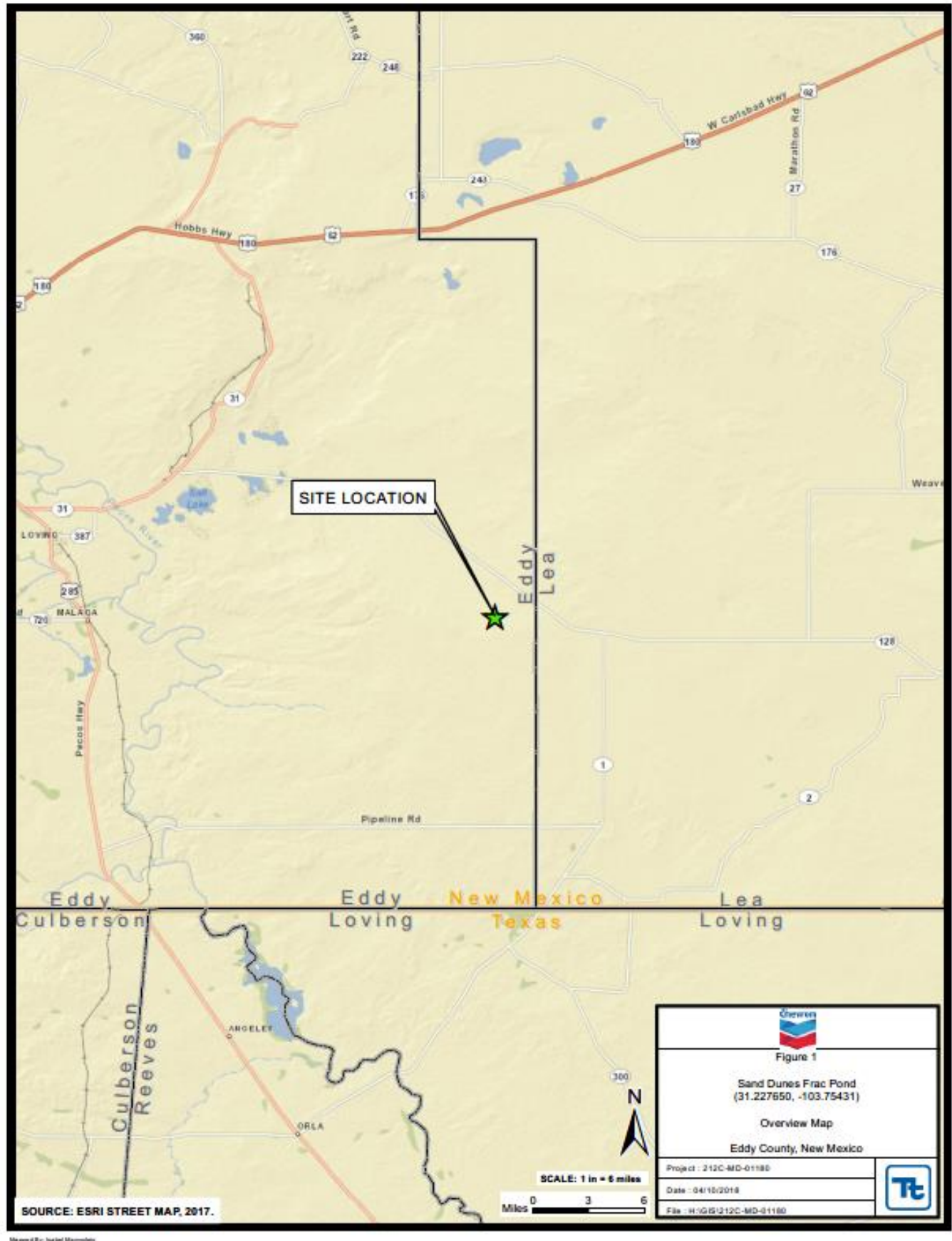
Chevron North America Exploration and Production Company (Chevron) plans to construct two water storage ponds (or impoundments) at their "Sand Dunes" site located in Eddy County, New Mexico. The two water storage ponds (ponds) will measure approximately 700 feet long by 340 feet wide with a maximum depth of approximately fifteen feet and total combined capacity of approximately 630,000 barrels (bbl) with three feet of freeboard. The ponds will be designed with a double liner and a leak detection system. The scope of the study for this project included the following.

- 1) Request a New Mexico 811 Utility locate;
- 2) Mobilize an air rotary drilling rig to drill four (4) borings to a depth of 30 feet to characterize the subsurface and one (1) boring to a depth of 80 feet, primarily to confirm presence or absence of groundwater;
- 3) Perform Modified California Sampler Tests (MC) at 5 or 10-foot intervals to evaluate soil consistency and collect soil samples for evaluation;
- 4) Backfill borings with soil cuttings after completion of drilling and 24-hour measurements, as required; and
- 5) Provide geotechnical engineering design criteria and recommendations and present the results in a geotechnical engineering report.

The general location of the site is shown on the Site Location Map, Figure 1 and Topographic Map, Figure 2.

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

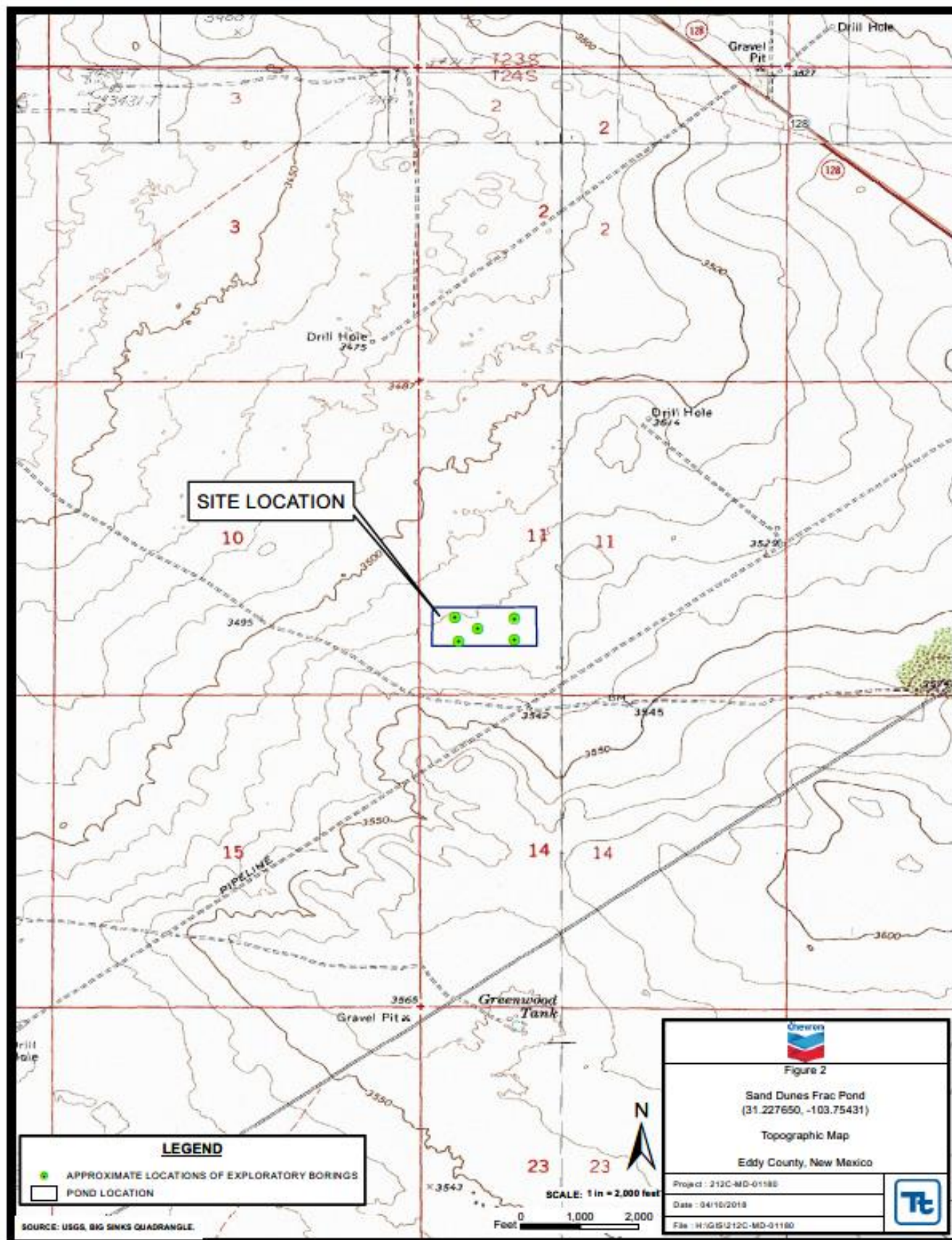
Chevron North America- MCBU





Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

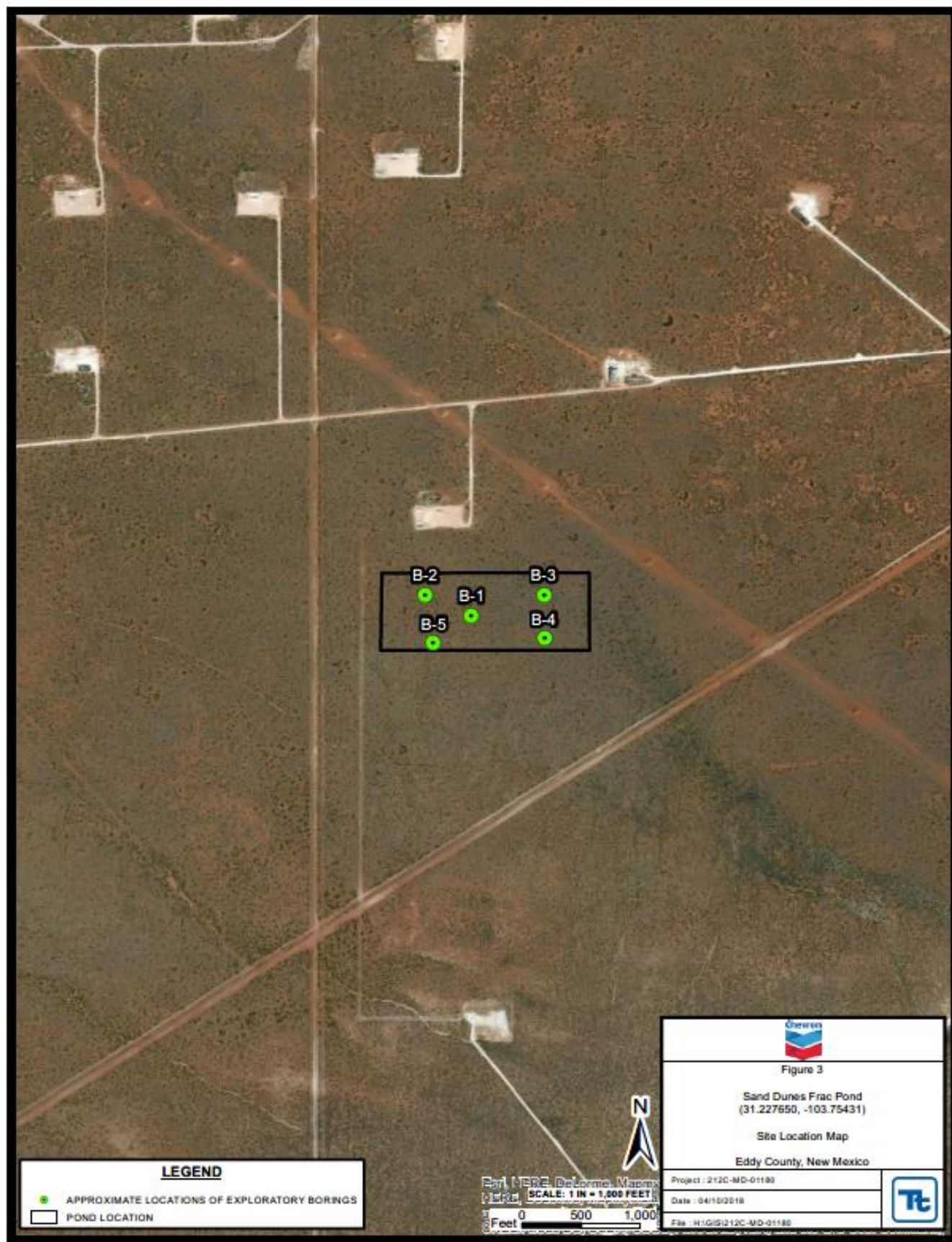
Chevron North America- MCBU





Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

Chevron North America- MCBU



## 2.0 SITE CONDITIONS

The project site for the proposed water storage impoundments are identified within this report as the Sand Dunes Frac Pond Site. It is located 30 miles southeast of Carlsbad in Eddy County, New Mexico, and approximately 1.7 miles southwest of NM-128 along Buck Jackson Rd. GPS coordinates recorded at the site are 32.227561°N and 103.754024°W.

The site was wooded with some mesquite trees, wild shrubs, and weeds, and appeared to be relatively flat. The immediate surrounding property was undeveloped.

## 3.0 PROPOSED DEVELOPMENT

The two water storage ponds (ponds) will measure approximately 700 feet long by 340 feet wide with a maximum depth of approximately fifteen feet and total combined capacity of approximately 630,000 barrels (bbl) with three feet of freeboard. The ponds will be designed with a double liner and a leak detection system and will be nearly entirely incised or below ground. The maximum berm height is expected to be 11.5 to 12.5 feet above the lowest adjacent ground. Interior and exterior berm slopes are anticipated to be 3H:1V. We understand that Chevron prefers to balance cut and fill volumes using onsite soil for fill to construct earthen berms for the impoundments and for other site leveling and/or grading improvements required immediately outside the impoundments. The bottom of the ponds will be sloped to drain to an installed liquid leak detection sump.

## 4.0 GEOLOGIC CONDITIONS

Mapping by the Natural Resources Conservation Service (NRCS, 2016) identifies the site soils as the Berino and Tonuco mapping units (Figure 4). These soils are both described as fine sands.

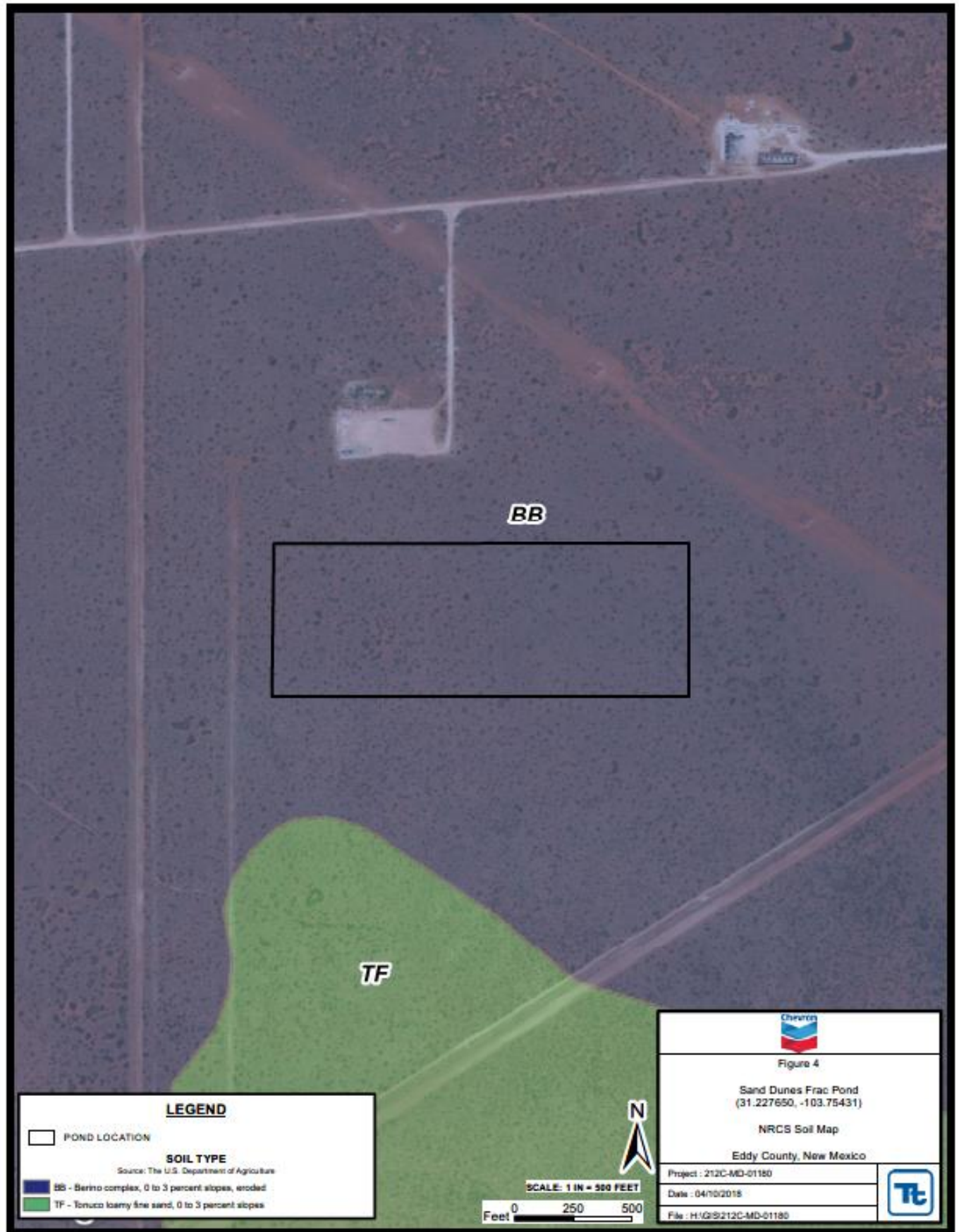
Review of mapping by the U.S. Geological Survey (Figure 5) indicates that the eolian and alluvial deposits entirely cover the project site. Deposits are typically a distinctive reddish-brown color and soils are weakly developed. Eolian sediments consist of wind-deposited sand and silt, augmented and modified by alluvial processes.

Our findings of the geotechnical study are consistent with this characterization within the depths explored.



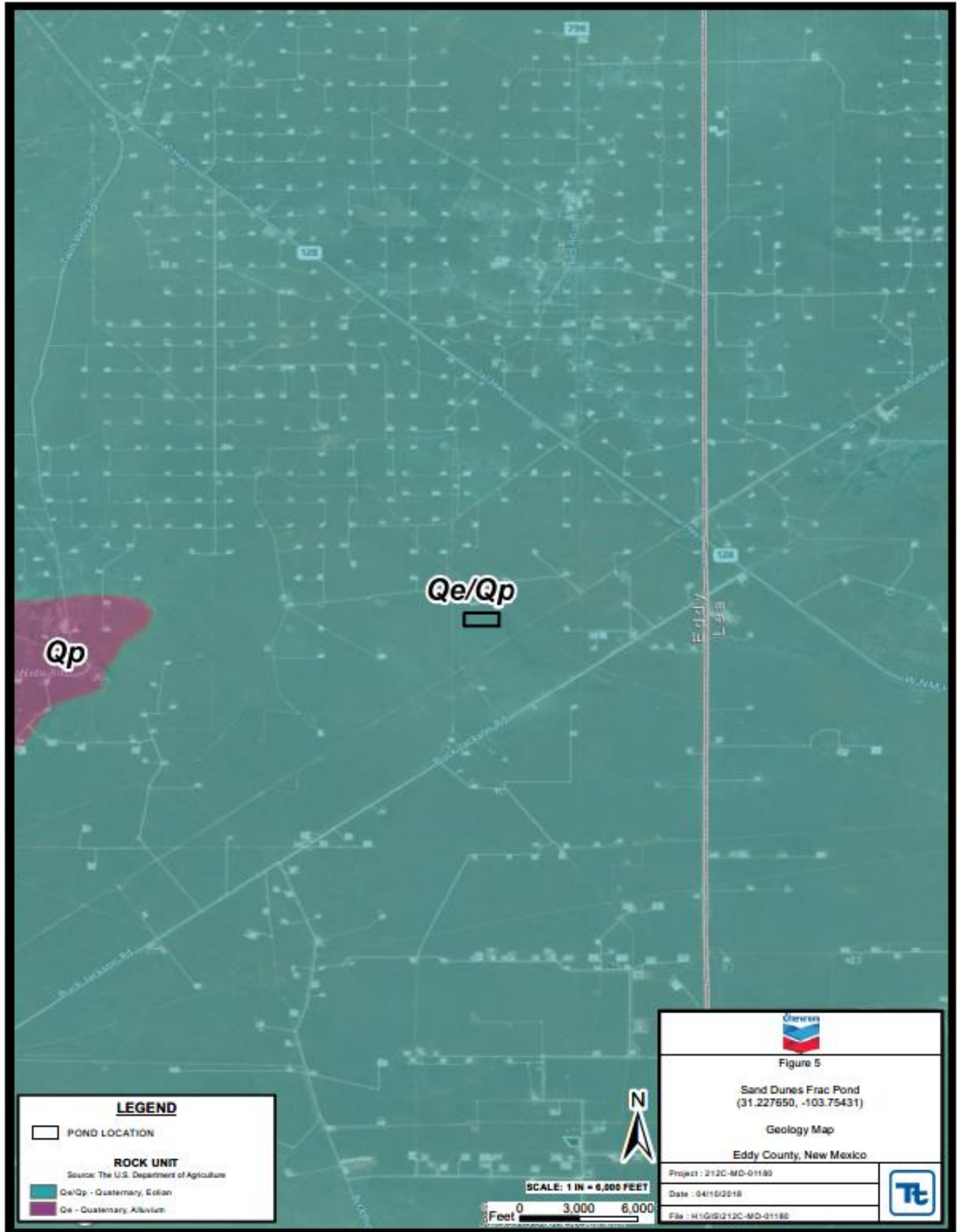
Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

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Eddy County, New Mexico

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## 5.0 EXPLORATORY SOIL BORINGS

Tetra Tech drilled five (5) exploratory soil borings (B-1 through B-5) between April 4 and 5, 2018 to identify subsurface conditions at the site. The boring locations were selected by a representative from Tetra Tech using a Google Earth map and proposed site development layout provided by Chevron. The proposed pond footprint was overlaid on the satellite image, and GPS coordinates were obtained for each boring location. The boring locations were marked in the field by Tetra Tech using these coordinates and a commercially available handheld GPS unit. The boring locations were cleared for drilling by comparing the proposed locations to buried utility locations marked by New Mexico 811 utility locating services. In addition, Tetra Tech cleared the boring locations using hand-held pipeline locating instruments.

The borings were drilled by TWE Drilling (TWE) using a track-mounted drilling rig. The ground surface was generally stable for the drilling rig to access the boring locations. Limited access issues were encountered such as negotiating around obstacles (shrubs and bushes). Tetra Tech's representative was on site to view site conditions, observe the drilling, and log the samples.

Air Rotary drilling equipment was used to complete the borings. Borings B-2 to B-5 were drilled to a depth of approximately 30 feet below the existing ground surface (bgs). Boring B-1 was drilled to an approximate depth of 80 feet bgs to investigate the presence or absence of groundwater.

Water was not encountered in the borings while drilling or immediately afterwards. The boreholes were backfilled with the excavated soils following completion of drilling and water level measurements.

Samples obtained during the field exploration were taken to Tetra Tech's laboratory where they were examined and visually classified according to the Unified Soil Classification System (USCS) as described by ASTM D 2487. Representative samples were selected for testing to determine the engineering and physical properties of the soils in general accordance with ASTM or other approved procedures. Tests included water content, dry density, particle size distribution, Atterberg limits, triaxial strength testing, and consolidation. The results of the laboratory tests are discussed below and presented in Table 1.

Soil samples were collected at depths of 1.5, 3.5, 6, 8.5, 13.5, 18.5, 23.5, and 28.5 feet. B-1 was drilled to a depth of 80 feet with additional sample collection at depths of 38.5, 48.5, 58.5, 68.5, and 78.5 feet to investigate the presence of groundwater. A 140-pound weight falling 30 inches was used to drive a "California-style" sampler into the undisturbed soils and bedrock. After "seating" the sampler into undisturbed soil, the number of blows required to drive the sampler in sequential 6-inch intervals was recorded similar to the Standard Penetration Test (SPT) (ASTM D 1586). The number of blows for each 12-inch interval (N-value) was recorded on the logs and was used to categorize the consistency of the soil. The N-values were corrected for the larger diameter of the sample barrel when

a "California style" sampler was used. A thin walled "Shelby tube" sample was also collected at three feet in boring B-2, and at 18.5 feet in boring B-3.

After drilling and sampling activities were complete the borings were backfilled with soil cuttings. The soil boring logs are presented in Appendix A, and approximate locations of the borings are shown in Figure 3.

## 6.0 SUBSURFACE CONDITIONS

The information from the borings indicates the subsurface conditions were relatively consistent within the area where the borings were drilled. Beneath minimal vegetation and topsoil, all five (5) borings encountered predominantly loose to very dense silty to clayey sand. At various depths, weak to strong cementation of soils was observed.

The in-situ moisture content of the samples ranged from 2.6 to 9.8 percent and the in-situ dry density ranged from 72.3 pounds per cubic foot (pcf) to 96.4 pcf. Laboratory tests showed the fines content (percent passing the #200 sieve) for all samples ranged from 12 to 61 percent indicating a coarse grained (silty/clayey sand) soil according to the Unified Soil Classification System (USCS). Atterberg limits testing of the clay and sandy clay soils indicated a liquid limit ranging from 24 to 39. The plasticity index in these soils ranged from 9 to 19. Samples classified as silty sand were non-plastic.

Consolidation testing of the specimen from B-4 at 1.5 feet bgs indicated a collapse of 6.0 percent when inundated with water under a load similar to the existing overburden pressure. The compression index ( $C_c$ ) was calculated to be 0.1 and the swell index ( $C_s$ ) was calculated to be 0.017.

Permeability testing of a sample from B-4 at 6 feet bgs indicated a hydraulic conductivity of  $2.5 \times 10^{-3}$  cm/s.

## 7.0 ENGINEERING ANALYSES AND RECOMMENDATIONS

### 7.1 Primary Geotechnical Considerations

The primary concerns that could impact the proposed development are the presence of desiccated silty and sandy soils that exhibited significant collapse potential on wetting, and degradation of subgrade or recompacted soils under construction equipment traffic. Although cementation was not widespread in the subsoils, the site includes zones or lenses of cemented materials, particularly on the west and central portions of the proposed pit footprint. These are discussed in greater detail below.

The on-site soils are generally susceptible to degradation under construction equipment traffic, especially when exposed to high moisture levels. Site soils may lose strength and stability over a narrow range of water content. Excessive pumping and rutting may occur during construction operations when such changes occur, especially under repeated traffic loads. Necessary precautions should be made to avoid excessive degradation of

the subgrade soils. If such conditions develop, it may be necessary to use more lightly loaded track mounted equipment in lieu of heavy rubber tired equipment.

Laboratory testing indicates that shallow silt and sand soils at this site are prone to collapse on wetting. Laboratory testing indicated a collapse of 6 percent. Preliminary designs indicate that the base of the ponds will be approximately 9 feet below the existing ground surface. It appears that depth will be below the collapse prone zone and therefore no special subgrade treatment or preparation will be needed. However, a representative of Tetra Tech should be present during excavation of the ponds to view the soils as they are exposed in order to confirm our assumption. If brittle soils with visible void structure are encountered at the base or in pit sidewalls, overexcavation and recompaction of the subgrade may be required to reduce the risk of damage to the liner system.

## **7.2 Site Preparation**

To prepare the site for pond construction, an area larger than the proposed footprint by at least 10 feet in plan dimension on all sides should be stripped of vegetation, roots, organic material, existing construction materials, debris, and other unsuitable materials. A typical stripping depth is approximately 6 inches; however, the actual depth will vary and should be based on field conditions and observations. After stripping, we anticipate a moderately stable surface for support of construction equipment. Unsuitable areas (such as those with loose, wet, soft, yielding, and/or pumping subgrade) should be corrected before construction proceeds.

Obstructions that could hinder preparation of the site should also be removed, with special attention given to unknown or un-documented below ground appurtenances and any existing above and below ground piping or flow lines. Care should be taken not to damage any existing buried utilities located within the footprint of the proposed construction. Any resulting utility trenches/excavations due to replacement or relocation of utilities should be backfilled as discussed in the Fill Placement and Compaction section of this report.

## **7.3 Excavation and Embankment Slopes**

Based on the subsurface data, sandy and silty soils with lenses of cemented material are present to depths of at least 80 feet below the existing grade. The northeast portion of the site is predominated by zones with less cementation, while the central and southwest portions of the pit may prove more difficult based on the boring logs and SPT tests. Conventional construction equipment can be used to excavate the ground. However, excavation into the cemented soils will be more difficult and additional effort or large, heavy duty rock ripping equipment like a ripper mounted on a Caterpillar D8 bulldozer or equivalent may be required in some areas.

The earthwork contractor should review the subsurface conditions and appropriately select excavation equipment and initial slope of the excavation to minimize potential sloughing and to remain in compliance with OSHA Regulations 1926.651 and 1926.652 on excavation safety. Wetting of the exposed excavation sides to a moisture content near

or slightly above optimum may be necessary to stabilize and maintain the slopes during construction.

During construction, the excavation slopes should be observed for safety purposes. Excavation slopes specified by OSHA are dependent on types of soil and groundwater conditions encountered. Based on our investigation the on-site soil is classified as Type C, and the cemented soils can be considered Type A or Type B soils according to OSHA 1926, Subpart P, Appendix A. In a layered environment the Type C soils will control excavation slopes. The contractor's "competent person" should identify the soils encountered in the excavation and refer to OSHA 1926.651 and 1926.652 to verify the conditions and classifications from our investigation and determine appropriate slopes. If deemed unstable, the excavation sides should be flattened or benched to remain in compliance. Stockpiles of soils and equipment should not be placed within a horizontal distance equal to one-half the excavation depth, from the edge of the excavation. Excavations deeper than 20 feet should be designed by a Professional Engineer as recommended by OSHA.

Limited slope stability analyses were performed and show that the proposed 3H:1V slopes meet or exceed minimum acceptable factors of safety. We recommend 3H:1V slopes based on consideration of other issues such as constructability, maintenance, and liner stability. If Chevron would like to consider construction of slopes steeper than the 3H:1V recommended above, Tetra Tech is available to conduct additional slope stability analysis to evaluate the feasibility of steeper slopes and liner system performance on those slopes. This analysis would be supported by slope stability modeling and hand calculations to present to the New Mexico Oil Conservation District (NMOCD) in a variance request.

## **7.4 Fill Placement and Compaction**

On-site soils free of rocks greater than 1 inch in diameter, organics, and debris are suitable for use as structural fill or backfill. Cemented soils, where encountered will likely require additional processing beyond ripping to achieve a soil consistency and meet the maximum particle size dimension in the construction specifications. Fill and backfill should not be placed on organics or other deleterious materials such as soil or rock with soluble components such as gypsum. If additional fill is needed for construction of the embankment, imported fill should be a well-graded clayey sand (SC) or low plasticity clay (CL), or imported soils with engineering properties that are similar to on-site soils (depending on the intended use of the fill). Prior to importation, samples of soils being considered as fill should be examined and evaluated by a geotechnical engineer for engineering properties to determine the suitability of the material for its intended use.

The bases of fills should be scarified at least 8 inches deep, moisture-conditioned or dried to within 2 percent of optimum moisture content, processed to a uniform condition, and then compacted to at least 95 percent of maximum dry density determined by standard Proctor (ASTM D698). For on-site and imported fill and backfill, moisture should be adjusted to within two percent of optimum moisture content as determined by standard



Proctor and the soils thoroughly mixed prior to placement and compaction to provide uniform water content throughout the fill.

Fill and backfill should be placed in uniform lifts of 8 inches or less in loose thickness and compacted to at least 95 percent of standard Proctor maximum dry density (ASTM D 698). Fill should be compacted using heavy vibratory equipment. In areas with limited space for heavy equipment, appropriate compaction equipment such as a jumping jack or other hand tools should be used. Where smaller compacting equipment or hand tools are used, the fill lifts should be 6 inches or less in loose thickness. The contractor should select the equipment type based upon the fill soil conditions.

Placement and compaction of fill should be observed and tested by a qualified geotechnical engineer or their qualified representative during construction. Each vertical foot of compacted fill placed should be tested for compaction comparison to standard Proctor results. A minimum of one moisture/density verification test should be performed for every 5,000-square-feet of compacted area, or for every 150-lineal feet of utility trench backfill. For smaller areas, a minimum of 3 verification tests should be conducted for every lift. Subsequent lifts should not be placed until the exposed lift has been tested to confirm compliance with the specified moisture and density. Lifts failing to meet the moisture and density requirements should be reworked to meet the required specifications prior to subsequent lifts being placed. Density and moisture verification testing is recommended to provide an indication that adequate earthwork is being performed. However, the quality of the fill and compaction is the sole responsibility of the contractor. Satisfactory verification testing is not a guarantee of the quality of the contractor's earthwork operations.

The specified moisture content must be maintained until compaction of the overlying lift, or until the cushioning sand layer or geotextile fabric and geomembrane liner are installed. Failure to maintain the specified moisture content could result in excessive soil movement resulting in embankment failure. The contractor must provide some means of controlling the moisture content (such as water hoses, water trucks, etc.). Maintaining subgrade moisture is always critical, but will require the most effort during warm, windy and/or sunny conditions.

## **7.5 Proof Rolling**

Proof rolling of the subgrade prior to fill placement and liner installation should be used to detect areas of soft and/or pumping soil. Proof rolling should be conducted using a heavy, rubber-tired vehicle weighing at least 25 tons, with the tires inflated to the manufacturer's specified operating pressure. The entire area should be proof rolled, with each succeeding pass offset by not greater than one tire width. The geotechnical engineer or an experienced soils technician should be present during proof rolling activities to assist with the identification of unsuitable soil. Unsuitable soil should be undercut and reworked, or otherwise improved in a manner that is suitable to the design and approved by the geotechnical engineer.

## 7.6 Geomembrane Liner Protection

Where the exposed surface is rough, rock protrusions and sharp edges can potentially damage the geomembrane liner. An irregular foundation with voids can create localized stress points on the geomembrane liner. The subsurface conditions at this site indicate a mix of silty, sandy, and clayey soils. However, the pond bottom might be underlain by areas of cemented soil with rock-like protrusions and surface irregularities, particularly in the western portion of the pond footprint. To protect the liner against punctures, a cushion, such as a fine grained sand layer, approximately 6 inches thick or a properly designed cushion geotextile should be installed below the liner in accordance with manufacturer recommendations. Liner requirements must meet those presented in the New Mexico Administrative Code (NMAC) 19.15.36.17.

## 7.7 Freeboard

An important aspect of embankment stability and performance is maintaining the appropriate freeboard (the vertical distance from the water surface to the crest of the embankment). If the freeboard is insufficient, the embankment could overtop, leading to excessive erosion and possible failure. The NMAC 19.15.36.17 regulations and MCBU General Standards require a minimum freeboard of three feet which must be maintained at all times. Based on the surface area of the pond, we opine three feet of freeboard is adequate to protect against overtopping due to precipitation or wave run up.

## 7.8 Settlement of Subgrade and Embankment Materials

Settlement of embankment material is another important aspect of embankment stability and total fluid storage potential over time. It is anticipated that the embankments will be constructed of fill consisting of on-site material or imported fill. The on-site sandy soils have a relatively low potential for post-construction settlement, however the site soils have significant collapse potential, as discussed in this report (see Section 7.1 above). A representative of Tetra Tech should be present during excavation of the ponds to view the soils as they are exposed in order to confirm that soil conditions are consistent with our assumptions. If brittle soils with visible void structure are encountered at the base or in pit sidewalls, overexcavation and recompaction of the subgrade may be required to reduce the risk of damage to the liner system.

Construction recommendations described above for proof rolling, subgrade improvements, and fill placement will mitigate collapse and reduce the amount of settlement.

## 7.9 Permitting

If applicable, a permit application should be filed with the NMOCD in accordance with NMAC regulations prior to construction. Construction and installation in accordance with NMOCD regulations found in the NMAC and the design drawings and construction specifications is recommended. The NMOCD may require notification prior to construction and prior to operation of the pond.

## 8.0 CONCLUSIONS

Our investigation found that subsurface conditions are generally favorable for construction of lined earthen storage ponds at this location. Construction in accordance with the recommendation of Section 7 in this report can mitigate the primary geotechnical concerns: collapsing soils at shallow depths, potentially soft or yielding soils that may develop during construction, and portions of the pond footprint that are underlain by hard, cemented soil/rock lenses.

We recommend designing the side slopes at an inclination of 3 horizontal to 1 vertical (3H:1V), which is consistent with New Mexico regulations, which state that the maximum allowed pond embankment slope is 3H:1V for exterior slopes and 2H:1V for interior slopes. New Mexico regulations do allow for variance if steeper slopes are required by the owner.

We recommend a cushion, such as a fine grained sand layer, approximately 6 inches thick or a properly designed cushion geotextile below the liner to reduce the risk of damage to the liner. Liner requirements must meet those presented in the New Mexico Administrative Code (NMAC) 19.15.36.17.

## 9.0 REFERENCES

U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS, 2016). Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>. Accessed October 10, 2017.

United States Geological Survey (USGS, 2005). Preliminary Integrated Geologic Map for the United States Central States. Open-File Report 2005-1351

## 10.0 LIMITATIONS

This report was prepared from data developed during our field exploration, laboratory testing, and engineering judgment. Our design recommendations were based on subsurface data and our experience with similar projects and subsurface conditions. Our borings were located to obtain a reasonable interpretation of subsurface conditions. It should be noted that the borings were widely spaced and variation in the subsoils between borings is likely.

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Eddy County, New Mexico*

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A Tetra Tech geotechnical engineer or their designated representative should observe the construction to look for evidence that would indicate differences in subsurface conditions from those described in this report. If any information becomes available that would alter our assumptions, conclusions or recommendations, the opinions presented in this report should be considered invalid until we have been contacted to review our recommendations based on the new information. The geotechnical engineer should review plans and specifications during the design. Placement and compaction of engineered fill, backfill, subgrade and other fills should be observed and tested by a representative of a Construction Materials Testing (CMT) firm during construction, and Tetra Tech should be retained to review these data.

We believe this study was conducted in a manner consistent with that level of skill and care ordinarily used by members of the profession currently practicing under similar conditions in the locality of this project. No warranty, express or implied, is made. If we can be of further service in discussing the contents of this report or in the analysis of the planned project from the geotechnical point of view, please contact us.




*Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico*

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**APPENDIX A**  
**EXPLORATORY BORING LOGS**

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

Chevron North America- MCBU


 <b>TETRA TECH</b>		Tetra Tech Inc. 4000 N. Big Spring, Suite 401 Midland, TX, 79705 Telephone: 432-682-4559 Fax: 432-682-3946		<b>BOREHOLE ID: B-1</b> PAGE 1 OF 3	
		<b>CLIENT</b> <u>Chevron</u>		<b>PROJECT NAME</b> <u>Sand Dunes Frac Pond</u>	
<b>PROJECT NUMBER</b> <u>212C-MD-01180</u>		<b>PROJECT LOCATION</b> <u>Eddy County, New Mexico</u>			
<b>DATE(S) OF DRILLING:</b> 04/04/2018		<b>GROUND ELEVATION:</b> NA		<b>METHOD:</b>	
<b>CONSULTANT:</b> Tetra Tech, Inc.		<b>LATITUDE:</b> 32.227650 N		<b>LOGGED BY:</b> Clint Merritt	
<b>DRILLING CONTRACTOR:</b> TWE		<b>LONGITUDE:</b> 103.754310 W		<b>DRILLED BY:</b> Keith Barge	
<b>Notes:</b> No groundwater encountered. Blowcounts have been corrected by sampler diameter.					
DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0					
	CA	2-3-4			
	CA	9-23-26	MC = 7.0% DD = 79.1 pcf LL = NP PL = NP PI = NP Fines = 28.3%	SM	
5	CA	11-22-50/5"			
	CA	37-31-50/5"	MC = 5.3% DD = 88.5 pcf LL = NP PL = NP PI = NP Fines = 17.9%	SM	
10					10.0
	CA	50/0"			
15					
	CA	50/4"			
20					
	CA	50/0"			
25					
	CA	50/6"	MC = 9.8% LL = 39 PL = 20 Fines = 60.7%	CL	
30					

BOREHOLE/TPWELL - TT SAND DUNE FRAC POND GPJ LAB SUMMARY GDT 5/18/18

(Continued Next Page)

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico


Chevron North America- MCBU

 <b>TETRA TECH</b>			Tetra Tech Inc. 4000 N. Big Spring, Suite 401 Midland, TX, 79705 Telephone: 432-682-4559 Fax: 432-682-3946		<b>BOREHOLE ID: B-1</b> PAGE 2 OF 3	
<b>CLIENT</b> <u>Chevron</u>			<b>PROJECT NAME</b> <u>Sand Dunes Frac Pond</u>			
<b>PROJECT NUMBER</b> <u>212C-MD-01180</u>			<b>PROJECT LOCATION</b> <u>Eddy County, New Mexico</u>			
DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
35						Hard, Red to Green Gray and White, <b>CLAY</b> , Low Plasticity, Slightly Moist <i>(continued)</i>
40	CA	50/3"				
45						
50	CA	50/2"				
55						
60	CA	50/2"				
65						

(Continued Next Page)

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

Chevron North America- MCBU


 <b>TETRA TECH</b>			Tetra Tech Inc. 4000 N. Big Spring, Suite 401 Midland, TX, 79705 Telephone: 432-682-4559 Fax: 432-682-3946		<b>BOREHOLE ID: B-1</b> PAGE 3 OF 3	
<b>CLIENT</b> <u>Chevron</u>			<b>PROJECT NAME</b> <u>Sand Dunes Frac Pond</u>			
<b>PROJECT NUMBER</b> <u>212C-MD-01180</u>			<b>PROJECT LOCATION</b> <u>Eddy County, New Mexico</u>			
DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
70	CA	50/3"				Hard, Red to Green Gray and White, <b>CLAY</b> , Low Plasticity, Slightly Moist (continued)
75						
80	CA	50/0"				
						Borehole terminated at 80.0 ft.

BOREHOLE/TPWELL - TT SAND DUNE FRAC POND GPJ LAB SUMMARY.GDT 5/18/18



*Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico*

Chevron North America- MCBU



**TETRA TECH**

Tetra Tech Inc.  
 4000 N. Big Spring, Suite 401  
 Midland, TX, 79705  
 Telephone: 432-682-4559  
 Fax: 432-682-3946

**BOREHOLE ID: B-2**  
 PAGE 1 OF 1

---

**CLIENT** Chevron

**PROJECT NUMBER** 212C-MD-01180

**PROJECT NAME** Sand Dunes Frac Pond

**PROJECT LOCATION** Eddy County, New Mexico

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**DATE(S) OF DRILLING:** 04/04/2018

**CONSULTANT:** Tetra Tech, Inc.

**DRILLING CONTRACTOR:** TWE

**GROUND ELEVATION:** NA

**LATITUDE:** 32.227600 N

**LONGITUDE:** 103.754300 W

**METHOD:**

**LOGGED BY:** Clint Merritt

**DRILLED BY:** Keith Barge

**Notes:** No groundwater encountered. Blowcounts have been corrected by sampler diameter.

---

DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0						
	CA	2-3-3				
	ST					
5						
	CA	8-3-3	MC = 5.0% DD = 72.3 pcf LL = NP PL = NP PI = NP Fines = 24.0%	SM		
		14-50/4"				
10	CA					
		20-50/3"				
15						
		50/4"				
20						
		50/0"				
25						
		50/0"				
30						


BOREHOLE/TP/WELL - TT SAND DUNE FRAC POND GPJ LAB SUMMARY GDT 5/18/18

30.0

Borehole terminated at 30.0 ft.


Proposed Recycled Water Storage Ponds  
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 <b>TETRA TECH</b>			Tetra Tech Inc. 4000 N. Big Spring, Suite 401 Midland, TX, 79705 Telephone: 432-682-4559 Fax: 432-682-3946			<b>BOREHOLE ID: B-3</b> PAGE 1 OF 1		
<b>CLIENT</b> <u>Chevron</u>			<b>PROJECT NAME</b> <u>Sand Dunes Frac Pond</u>					
<b>PROJECT NUMBER</b> <u>212C-MD-01180</u>			<b>PROJECT LOCATION</b> <u>Eddy County, New Mexico</u>					
<b>DATE(S) OF DRILLING:</b> 04/05/2018			<b>GROUND ELEVATION:</b> NA			<b>METHOD:</b>		
<b>CONSULTANT:</b> Tetra Tech, Inc.			<b>LATITUDE:</b> 32.228110 N			<b>LOGGED BY:</b> Clint Merritt		
<b>DRILLING CONTRACTOR:</b> TWE			<b>LONGITUDE:</b> 103.752610 W			<b>DRILLED BY:</b> Keith Barge		
<b>Notes:</b> No groundwater encountered. Blowcounts have been corrected by sampler diameter.								
DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION		
0						Medium Dense to Very Dense, Red to Light Brown, Fine Grained <b>CLAYEY to SILTY SAND</b> . Variable Plasticity from None to Low, Dry to Slightly Moist, with Caliche		
	CA	3-5-7						
	CA	5-6-10						
5	CA	5-11-12						
	CA	10-12-12						
			MC = 3.6% LL = 29 PL = 14 PI = 15 Fines = 28.3% Eff. P <sub>h</sub> = 33.4 deg Eff. C = 164.6 psf	SC				
10								
	CA	3-3-4	MC = 5.2% LL = NP PL = NP PI = NP Fines = 20.2%	SM				
15								
	ST							
20								
	CA	50/0"						
25								
	CA	50/0"						
30								
						30.0	Borehole terminated at 30.0 ft.	

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

Chevron North America- MCBU

Tetra Tech Inc. 4000 N. Big Spring, Suite 401 Midland, TX, 79705 Telephone: 432-682-4559 Fax: 432-682-3946			<b>BOREHOLE ID: B-4</b> PAGE 1 OF 1			
<b>CLIENT</b> Chevron			<b>PROJECT NAME</b> Sand Dunes Frac Pond			
<b>PROJECT NUMBER</b> 212C-MD-01180			<b>PROJECT LOCATION</b> Eddy County, New Mexico			
<b>DATE(S) OF DRILLING:</b> 04/05/2018			<b>GROUND ELEVATION:</b> NA		<b>METHOD:</b>	
<b>CONSULTANT:</b> Tetra Tech, Inc.			<b>LATITUDE:</b> 32.227120 N		<b>LOGGED BY:</b> Clint Merritt	
<b>DRILLING CONTRACTOR:</b> TWE			<b>LONGITUDE:</b> 103.752600 W		<b>DRILLED BY:</b> Keith Barge	
<b>Notes:</b> No groundwater encountered. Blowcounts have been corrected by sampler diameter.						
DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS	TESTS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0						
	CA	2-2-3	MC = 3.4% DD = 96.4 pcf LL = NP PL = NP PI = NP	SM		Loose to Very Dense, Red to Light Brown, Fine Grained <b>CLAYEY to SILTY SAND</b> , Variable Plasticity from None to Low, Dry, with Caliche
	CA	3-3-10	Fines = 16.3% MC = 6.0% DD = 85.1 pcf LL = 24 PL = 15 PI = 9	SC		
5	CA	14-50/3"	Fines = 31.1%			
	CA	50/2"				
10						
	CA	11-15-31	MC = 3.1% LL = NP PL = NP PI = NP	SM		
15			Fines = 12.1%			
	CA	50/0"				
20						
	CA	50/0"				
25						
	CA	50/0"				
30						
	CA	50/0"				
30.0						Borehole terminated at 30.0 ft.

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

Chevron North America- MCBU

Tetra Tech Inc. 4000 N. Big Spring, Suite 401 Midland, TX, 79705 Telephone: 432-682-4559 Fax: 432-682-3946		<b>BOREHOLE ID: B-5</b> PAGE 1 OF 1			
<b>CLIENT</b> Chevron		<b>PROJECT NAME</b> Sand Dunes Frac Pond			
<b>PROJECT NUMBER</b> 212C-MD-01180		<b>PROJECT LOCATION</b> Eddy County, New Mexico			
<b>DATE(S) OF DRILLING:</b> 04/05/2018		<b>GROUND ELEVATION:</b> NA			
<b>CONSULTANT:</b> Tetra Tech, Inc.		<b>METHOD:</b>			
<b>DRILLING CONTRACTOR:</b> TWE		<b>LOGGED BY:</b> Clint Merritt			
		<b>DRILLED BY:</b> Keith Barge			
<b>Notes:</b> No groundwater encountered. Blowcounts have been corrected by sampler diameter.					
DEPTH (ft)	SAMPLE TYPE	BLOW COUNTS	TESTS	U.S.C.S. GRAPHIC LOG	MATERIAL DESCRIPTION
0					
	CA	1-2-7	MC = 2.6% LL = NP PL = NP PI = NP Fines = 14.9%	SM	Loose to Very Dense, Red to Light Brown, Fine Grained <b>SILTY SAND</b> , Dry to Slightly Moist, with Caliche
5	CA	10-18-28			
	CA	27-50/4"			
10	CA	50/2"			
15	CA	11-17-21			Dense to Very Dense, Light Brown, <b>CLAYEY GRAVEL</b> , Slightly Moist
20	CA	31-33	MC = 9.2% LL = 32 PL = 20 PI = 12 Fines = 45.7%	GC	Very Dense, Red to Light Brown, Fine Grained <b>SILTY SAND</b> , Slightly Moist, with Caliche
25	CA	50/0"			
30	CA	50/0"			
Borehole terminated at 30.0 ft.					



*Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico*

*Chevron North America- MCBU*

**APPENDIX B**  
**LABORATORY SUMMARY**

Proposed Recycled Water Storage Ponds  
Eddy County, New Mexico

Chevron North America- MCBU

TETRA TECH

Tetra Tech Inc.

4000 N. Big Spring, Suite 401

Midland, TX, 79705

Telephone: 432-682-4559

Fax: 432-682-3946

CLIENT

Chevron

PROJECT NUMBER

212C-MD-01180

SUMMARY OF LABORATORY RESULTS

PAGE 1 OF 1

PROJECT NAME

Sand Dunes Frac Pond

PROJECT LOCATION

Eddy County, New Mexico

Borehole Identification	Depth	Water Content (%)	Dry Density (pcf)	Atterberg's Limits (LL/PL/P <sub>I</sub> )	Max Dry Density (pcf)/ OMC(%)	Fines Content (%)	USCS Classification	Swell (%), Swell pressure (psf)	C <sub>c</sub> , C <sub>s</sub>	Permeability (cm/s)	pH, Resistivity (Ohm-m)	Sulfate, Chloride Content (ppm)	Triaxial Shear Strength c'(psf), phi'	Specific Gravity
B-1	3.5	7.0	79.1	NP		28	SM							
B-1	8.5	5.3	88.5	NP		18	SM							
B-1	28.5	9.8		39/20/19		61	CL							2.8
B-2	6.0	5.0	72.3	NP		24	SM							
B-3	6.5	3.6		29/14/15		28	SC						164.6,33.4	
B-3	13.5	5.2		NP		20	SM							
B-4	1.5	3.4	96.4	NP		16	SM	-6	0.1,0.017					
B-4	3.5	6.0	85.1	24/15/9		31	SC			2.50E-03				
B-4	13.5	3.1		NP		12	SM							
B-5	1.5	2.6		NP		15	SM							
B-5	18.5	9.2		32/20/12		46	GC							

LAB SUMMARY-TRIAxIAL SAND DUNE FRAC POND.GPJ LAB SUMMARY.GDT 5/18/18

**Attachments 3 – DOI-BLM-NM-2020-0972-EA, Section 1.6, Scoping, Public Involvement, and Issues (2020)**

Temporary Pit containing non-low chloride fluids

Javelina Unit 601 Pit

Section 9, T24S, R31E

# United States Department of the Interior Bureau of Land Management

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Environmental Assessment DOI-BLM-NM-2020-0972-EA

NM-141811

**MarkWest Energy West Texas Gas Co., LLC**  
**Chevron Sand Dunes**  
**Eddy County, New Mexico**

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Department of the Interior  
Bureau of Land Management  
Pecos District  
Carlsbad Field Office  
620 E Greene Street  
Carlsbad, NM 88220  
Phone: (575) 234-5972  
FAX: (575) 885-9264

## Confidentiality Policy

Any comments, including names and street addresses of respondents, you submit may be made available for public review. Individual respondents may request confidentiality. If you wish to withhold your name or street address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

**BLM**

**Carlsbad Field Office**



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# 1. PURPOSE AND NEED FOR ACTION

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## 1.1. Background

The applicant has submitted an SF-299 (Application for Transportation and Utility Systems on Public Lands) to the BLM, Carlsbad Field Office (CFO) requesting permission to construct, operate, terminate, upgrade and maintain buried 20-inch steel gas pipeline and a pad site. The general location is approximately 17.5 miles southeast of Loving, New Mexico in Eddy County.

Preparing Office:  
Pecos District, Carlsbad Field Office  
620 East Greene Street  
Carlsbad, NM 88220

## 1.2. Purpose and Need for Action

The purpose of the action is to provide reasonable access across BLM-managed lands for a gas pipeline and facility site to assist oil and gas leasees with production from their Federal and non-Federal mineral leases.

The need for the action is established under BLM's responsibility under the Mineral Leasing Act of 1920 as amended and the Federal Land Policy and Management Act of 1976 to respond to a request for a right-of-way grant for construction of a pipeline.

## 1.3. Decision to be Made

Based on the information provided in this Environmental Assessment, the BLM Field Manager will decide whether to grant the right-of-way application with appropriate mitigation measures, or whether to reject it.

## 1.4. Conformance with Applicable Land Use Plan(s)

The 1988 Carlsbad Resource Management Plan, as amended by the 1997 Carlsbad Approved Resource Management Plan Amendment and the 2008 Special Status Species Approved Resource Management Plan Amendment have been reviewed, and it has been determined that the proposed action conforms with the land use plan terms and conditions as required by 43 CFR 1610.5.

Name of Plan: 1988 Carlsbad Resource Management Plan

Date Approved: September 1988

Decision: [Page 10] "In general, public lands are available for utility and transportation facility development..." [Page 13] "BLM will encourage and facilitate the development by private industry of public land mineral resources so that national and local needs are met, and environmentally sound exploration, extraction, and reclamation practices are used."

Name of Plan: 1997 Carlsbad Approved Resource Management Plan Amendment

Date Approved: October 1997

Goal: [Page 4] "Provide for leasing, exploration and development of oil and gas resources within the Carlsbad Resources Area." The proposed action aids in the development of oil and gas resources and complies with the Surface Use and Occupancy Requirements.

Name of Plan: 2008 Special Status Species Approved Resource Management Plan Amendment

Date Approved: April 2008

Decision: [Page 5] "For all other projects in the Planning Area, public land will be open to the consideration of granting ROWs under the guidelines in Appendix 2 of the 1997 Roswell RMP and 1997 Carlsbad RMPA." [Page 6] "...ROWs will be granted only after site-specific analysis." The proposed action will utilize best management practices when developing oil and gas resources in Lesser Prairie-Chicken and Sand Dune Lizard Habitat. Special mitigation measures will be included into the Pecos District Conditions of Approval.

## 1.5. Relationship to Statutes, Regulations or Other Plans

The following is a list of statutes that may apply to a proposed action:

- **Archaeological and Historic Preservation Act of 1974 (16 USC 469)** - Provides for the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of (1) flooding, the building of access roads, the erection of workmen's communities, the relocation of railroads and highways, and other alterations of the terrain caused by the construction of a dam by any agency of the United States, or by any private person or corporation holding a license issued by any such agency or (2) any alteration of the terrain caused as a result of any Federal construction project or federally licensed activity or program.
- **Archaeological Resources Protection Act of 1979, as amended (16 USC 470 et seq.)** - Secures, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, the professional archaeological community, and private individuals.
- **Clean Air Act of 1970, as amended (42 USC 7401 et seq.)** - Defines EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer.
- **Clean Water Act of 1977, as amended (30 USC 1251)** - Establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters.
- **Endangered Species Act of 1973 (16 USC 1531 et seq.)** - Protects critically imperiled species from extinction as a consequence of economic growth and development untempered by adequate concern and conservation.
- **Federal Cave Resources Protection Act of 1988 (16 USC 4301 et seq.)** - Protects significant caves on federal lands by identifying their location, regulating their use, requiring permits for removal of their resources, and prohibiting destructive acts.
- **Lechuguilla Cave Protection Act of 1993** - Protects Lechuguilla Cave and other resources and values in and adjacent to Carlsbad Caverns National Park.
- **Migratory Bird Treaty Act of 1918 (16 USC 703-712)** - Implements the convention for the protection of migratory birds.
- **Mining and Mineral Policy Act of 1970, as amended (30 USC 21)** - Fosters and encourages private enterprise in the development of economically sound and stable industries, and in the orderly and economic development of domestic resources to help assure satisfaction of industrial, security, and environmental needs.
- **National American Graves Protection and Repatriation Act of 1990 (25 USC 301)** - Provides a process for museums and Federal agencies to return certain Native American cultural items such as human remains, funerary objects, sacred objects, or objects of cultural patrimony to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations and includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American cultural items on Federal and tribal lands, and penalties for noncompliance and illegal trafficking.
- **National Historic Preservation Act of 1966, as amended (16 USC 470)** - Preserves historical and archaeological sites.
- **Wild and Scenic Rivers Act of 1968, as amended (16 USC 1271 et seq.)** - Preserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.

- **Wilderness Act of 1964 (16 USC 1131 et seq.)** - Secures for the American people of present and future generations the benefits of an enduring resource of wilderness.

## 1.6. Scoping, Public Involvement, and Issues

The Carlsbad Field Office (CFO) publishes a NEPA log for public inspection. This log contains a list of proposed and approved actions in the field office. The log is located in the lobby of the CFO as well as on the BLM New Mexico website ([http://www.blm.gov/nm/st/en/prog/planning/nepa\\_logs.html](http://www.blm.gov/nm/st/en/prog/planning/nepa_logs.html)).

The CFO uses Geographic Information Systems (GIS) in order to identify resources that may be affected by the proposed action. An electronic map of the project area is prepared to display the resources in the area and to identify potential issues.

The proposed action was circulated among CFO resource specialists in order to identify any issues associated with the project. The issues that were raised include:

- How would air quality be impacted by the proposed action?
- How would climate change be impacted by the proposed action?
- How would range management be impacted by the proposed action?
- How would soils be impacted by the proposed action?
- How would vegetation be impacted by the proposed action?
- How would Lesser Prairie chicken habitat be impacted by the proposed action?
- How would wildlife habitat be impacted by the proposed action?
- How would visual resources be impacted by the proposed action?
- Could noxious weeds be impacted by the proposed action?
- How would paleontological resources be impacted by the proposed action?
- How would cultural resources be impacted by the proposed action?

## 2. PROPOSED ACTION AND ALTERNATIVE(S)

### 2.1. Proposed Action

The BLM Carlsbad Field Office is proposing to allow MarkWest Energy West Texas Gas Co, LLC (MarkWest) to construct, operate and maintain a buried 20-inch steel gas pipelines and a facility site under a right-of-way (ROW). The proposed pipelines would be 16,770.31 feet long (3.2 miles) on BLM and 6,129.12 feet (1.16 miles) on State of New Mexico. The ROW would include pigging facilities, pumps, SCADA communications and metering equipment on a pad site (100 ft. X 100 ft.) as well as other related facilities within the proposed ROW. Refer to Figure 1 for a map showing the location of the project on BLM.

To facilitate construction in a safe manner, a total construction width of 30 feet (long term ROW) plus an additional 20 feet of mowed temporary work area (during the construction phase only) is being requested to facilitate safe movement of personnel and heavy equipment. This is due to the sandy loam soils that often experience trench collapse and have the potential to impact human safety and damage equipment (see Figure 2).

#### Buried Pipeline and Pad

Standard pipeline construction practices would be employed for the pipeline and pad. These typically involve the following sequential steps: staking, clearing and grading, ditching, stringing and bending of pipe, welding, joint coating, lowering the pipe into the trench, backfilling the trench, hydrostatic testing, and reclamation of the ROW.



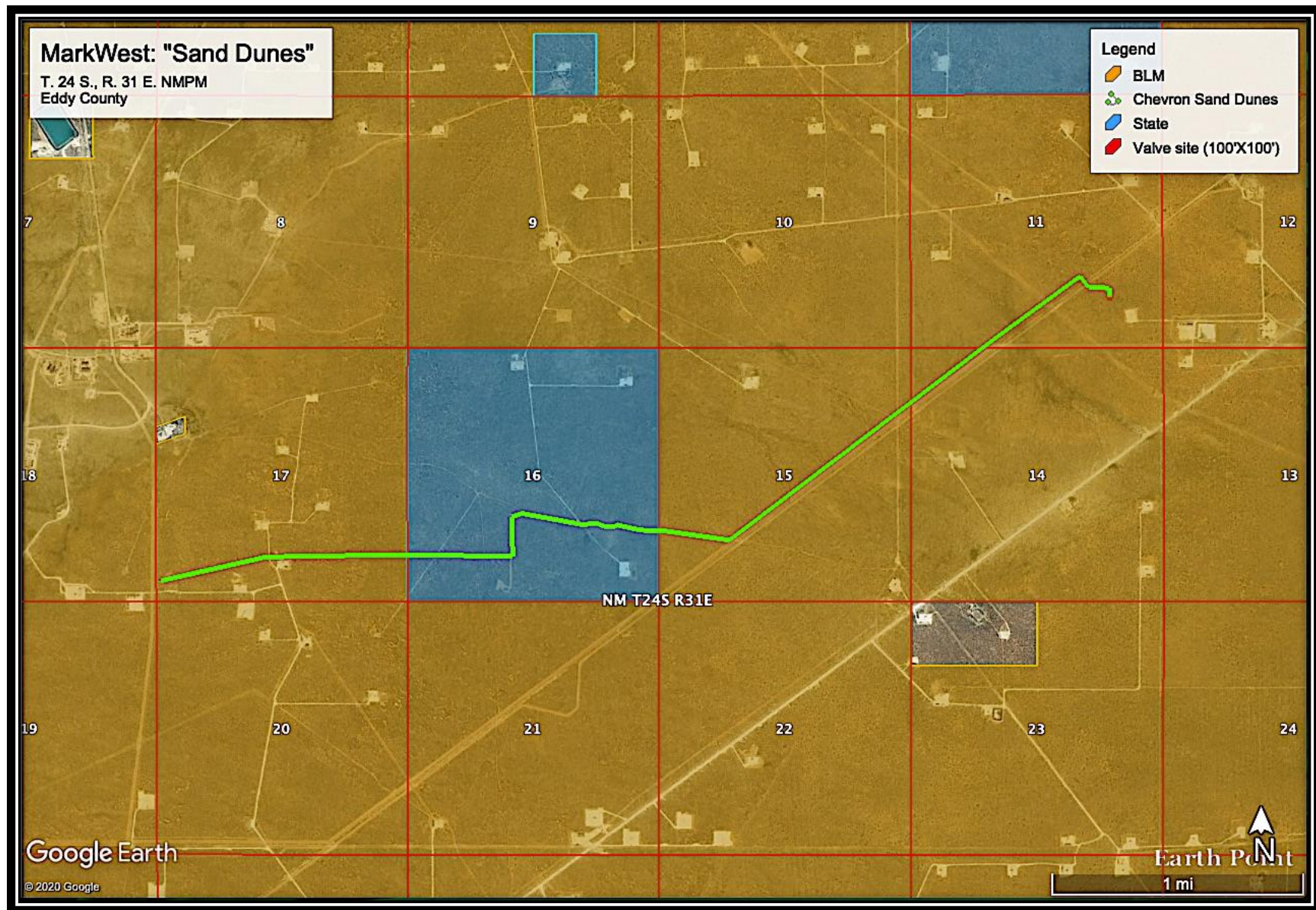


Figure 1: Overview map of proposed "Chevron Sand Dunes" project.

The initial step consists of preparing the ROW area. If necessary, survey stakes may need to be re-established if they are missing, or have been knocked down by livestock or other activities in the area. The 30-feet of long term ROW would be bladed and leveled for construction activities. The 20 foot of temporary use space adjacent to the ROW would be mowed to provide additional safe work surface for welding and equipment.

Typically, a motor grader or bulldozer is used to knock down vegetation, such as mesquite and other brush within the area authorized for blading. Where rock or caliche is near the surface, equipment may be used to rip the subsurface material to facilitate trench digging. This is usually accomplished by a stinger blade on a bulldozer or motor grader. When the ROW crosses fences, they would be braced, cut and temporarily fitted with a gate to permit passage of construction equipment and control livestock movement. Upon completion of construction, the fences would be put back in place unless a permanently installed gate is authorized.

The next step involves digging the trench to accommodate the buried pipeline. For longer lines, this is often accomplished with a wheel trencher. This piece of equipment digs a ditch to the desired width and depth while stacking the excavated soil along one edge of the ROW. In some cases, the trench is dug using trackhoes. When it is necessary for the pipeline to cross a road that is not heavily used, it can be trenched across and then backfilled and compacted in a way that would maintain the integrity of the roadbed. However, when pipelines cross more heavily traveled roads (especially paved roads) the line is installed using a road bore. This technique helps maintain the integrity of the road surface and avoids disruption of traffic on the road.

The next step is to haul in pipe and lay it along the ROW. Typically, pipe is hauled to the ROW by trucks utilizing long flatbed trailers. To accommodate laying the pipeline within the contours of the trench, a machine may be used to bend the pipe to fit the trench contour. The pipe is then cribbed up (typically using wood blocks) to keep it off the ground so the joints can be welded together. The welders use  $\frac{3}{4}$  to one-ton trucks with mounted welding machines to drive from one joint to the next. Once welding is complete, the joints are inspected to insure they meet or exceed quality requirements. While pipe often comes pre-coated (to prevent corrosion), additional coating would be applied to the areas that were welded.

Once welding and coating are completed, track driven side boom caterpillar tractors drive along the ROW to lower the pipe into the trench. If there are rocky areas that have been excavated, before the pipe is laid into the trench it is often padded with sand or soil to prevent rocks from damaging the coating.

After the pipe is in the trench, heavy equipment such as a backhoe, motor grader or caterpillar would be used to push the excavated dirt back into the trench. The backfill is then compacted utilizing wheeled equipment (like the motor grader) or the track of a bulldozer to minimize settling. After construction, the trench is often recognizable by the backfill berm left in place to accommodate any future settling. Once the pipeline is in place, ancillary facilities such as pig launchers, pumps, SCADA communications and meter stations would be installed on the central tank battery site. Figure 3 shows a typical facility with pig launching capabilities and SCADA communications equipment.

The final step involves testing the pipeline and valves on the pad site with water (hydrostatic testing). The pipe is tested to a pressure higher than what it would be operated at on a day-to-day basis. Following construction, if there were any minor deviations that were approved by BLM during construction, "as-built" survey plats would be provided to BLM for the ROW case record.

Contingent upon receipt of necessary approvals, construction could commence as early as one day after issuance of the BLM ROW grant for the project. After the project is placed into service, the pipeline would be periodically inspected from the air and ground. The surveillance activities would provide information on possible encroachments from nearby activities, erosion, exposed pipe and other potential concerns that could affect safety of the pipeline.





Figure 2. Example of trench collapse in loose sandy soil.



Figure 3. Typical layout of pig launcher and SCADA communications equipment.

Contingent upon receipt of necessary approvals, construction could commence after issuance of the BLM ROW grant for the pipeline. After the project is placed into service, the pipeline would be periodically inspected from the air and/or ground. The surveillance activities would provide information on possible encroachments from nearby activities, erosion, exposed pipe and other potential concerns that could affect safety of the pipelines.

The legal land description on BLM land is described as follows:

**T. 24 S., R. 31 E., NMPM**

- sec. 11: SE $\frac{1}{4}$ SW $\frac{1}{4}$ , SE $\frac{1}{4}$ ;  
 sec. 14: N $\frac{1}{2}$ NW $\frac{1}{4}$ ;  
 sec. 15: NE $\frac{1}{4}$ NE $\frac{1}{4}$ , S $\frac{1}{2}$ NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , NW $\frac{1}{4}$ SE $\frac{1}{4}$ ;  
 sec. 17: S $\frac{1}{2}$ S $\frac{1}{2}$ .

All in Eddy County, New Mexico.

Action	Length (ft.)	Width (ft.)	Acres
Chevron Sand Dunes pipeline ROW area - BLM	16,770.31	30	11.55
Temporary ROW (construction only)	16,770.31	20	7.70
Pad site (100' X 100')	100	100	0.23
Chevron Sand Dunes pipeline ROW area - State	6,129.12	30	4.22
Temporary ROW (construction only)	6,129.12	20	2.81
Total Chevron Sand Dunes pipeline long-term ROW State of NM and BLM			16.00
Total Chevron Sand Dunes pipeline (construction only)			10.51

**Mitigation Measures:**

1. The maximum allowable disturbance for construction in this right-of-way will be **50 feet**: Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **30 feet**. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **50 feet**. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*) "

2. "Waterbars" of sufficient height and width shall be placed on and perpendicular to the ROW (at no more than 500 foot intervals) to deter vehicle traffic from driving on the pipeline ROW.
3. To ensure compliance, the company shall also have in their immediate possession a copy of the right-of-way grant and stipulations while installing the pipeline.
4. To protect a burrowing owl burrow on State land in T. 24 S., R. 31 E. section 16: SE $\frac{1}{4}$ SW $\frac{1}{4}$  (Waypoint 2158), no pipeline construction will occur from March 1st through August 31 within 200 meters of the nest.

5. Once construction is completed, the right-of-way will be reseeded according to the BLM requirements (seed mix #1 for loamy soils) attached to the grant.
6. If any skeletal remains that might be human or funerary objects are discovered by any activities, the project proponent will cease activities in the area of discovery and notify the BLM within 24 hours as required by the Permian Basin PA.
7. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.
8. Throughout the life of the pipeline system, any damage to structures which provide water to livestock (caused by construction or operations of the pipeline) must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the grazing allotment holder if any damage occurs to structures that provide water to livestock.
9. Where entry is granted across a fence line, the fence must be braced and tied off on both sides of the passageway with H-braces prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences. Any new gates shall be discussed with the grazing permittee and approved by the BLM.
10. To limit any impacts to vegetation and to protect any special status plant species that were not observed during field surveys, vehicles and equipment would be kept on existing roads and approved surfaces and would avoid travel across undisturbed surfaces; workers would be instructed not to park off roads or ROWs in undisturbed areas.

## **2.2. No Action Alternative**

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EAs) on externally initiated proposed actions, the No Action Alternative generally means that the proposed activity will not take place. This option is provided in 43 CFR 3162.3-1 (h) (2). This alternative would deny the approval of the proposed application, and the current land and resource uses would continue to occur in the proposed project area. No mitigation measures would be required. Selection of the No Action Alternative could result in produced natural gas being flared on leases.

## **2.3. Alternatives Analyzed in Detail**

Based on the current proposed route, there are no alternate routes that would have significantly fewer impacts or any clearer advantages over the proposed action. If an alternate route were required, overall impacts to natural resources would be substantially similar or possibly greater than the proposed action.

The entire route was analyzed to determine potential impacts to natural and cultural resources. These potential impacts would be minimized through the design of the project, and the implementation of appropriate mitigation measures. These measures are described for all resources potentially impacted in Chapter 3 of this EA. Therefore, no additional alternatives other than those listed above have been considered for this project.

### 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

---

Projects requiring approval from the BLM such as right-of-way grants can be denied when the BLM determines that adverse effects to resources (direct or indirect) cannot be mitigated to reach a Finding of No Significant Impact (FONSI). Under the No Action Alternative, the proposed project would not be implemented and there would be no new impacts to natural or cultural resources from the proposed project. The No Action Alternative would result in the continuation of the current land and resource uses in the project area and is used as the baseline for comparison of environmental effects of the analyzed alternatives.

During the analysis process, the interdisciplinary team considered several resources and supplemental authorities. The interdisciplinary team determined that the resources discussed below would be affected by the proposed action.

#### 3.1. Air Resources

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##### 3.1.1. Affected Environment

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The two components of air resources are air quality and climate. This document summarizes the technical information related to air resources and climate change associated with oil and gas development and the methodology and assumptions used for analysis.

##### Air Quality

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Air quality is determined by atmospheric pollutants and chemistry, dispersion meteorology and terrain, and also includes applications of noise, smoke management, and visibility. The area of the proposed action is within the Pecos River airshed and is classified as a Class II Air Quality Area. A Class II area allows moderate amounts of air quality degradation. The primary causes of air pollution in the project area are from motorized equipment and dust storms caused by strong winds during the spring.

Particulates from nearby oil and gas production, agricultural burning, recreational and industrial vehicular traffic and ambient dust can also affect air quality. Air quality in the area near the proposed action is generally considered good, and the proposed action is not located in any of the areas designated by the Environmental Protection Agency (EPA) as “non-attainment areas” for any listed pollutants regulated by the Clean Air Act.

The EPA’s Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2012 found that in 2012, total U.S. GHG emissions were over 6 billion metric tons and that total U.S. GHG emissions have increased by 4% from 1990 to 2012. The report also noted that GHG emissions fell by 3% from 2011 to 2012. This decrease was, in part, attributed to the increased use of natural gas and other alternatives to burning coal in electric power generation (U.S. Environmental Protection Agency, 2014).

##### Climate

---

The 2013 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) states that the atmospheric concentrations of well-mixed, long-lived greenhouse gases (GHGs), including carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), have increased to levels unprecedented in at least the last 800,000 years. Further, human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes. It is extremely likely (95 – 100% probability) that human influence has been the dominant cause of the observed warming since the mid-20th century (Intergovernmental Panel on Climate Change, 2013).



Global mean surface temperatures have already increased 1.5 degrees F from 1880 to 2012. Additional near-term warming is inevitable due to the thermal inertia of the oceans and ongoing GHG emissions. Assuming there are no major volcanic eruptions or long-term changes in solar irradiance, global mean surface temperature increases for the period 2016 – 2035 relative to 1986-2005 will likely be in the range of 0.3 – 0.7°C (0.5 – 1.3°F). Global mean temperatures are expected to continue rising over the 21st century under all of the projected future RCP concentration scenarios. Global mean temperatures in 2081 – 2100 are projected to be between 0.3 – 4.8°C (0.5 – 8.6°F) higher relative to 1986 – 2005. The IPCC projections are consistent with reports from other organizations (e.g. NASA Goddard Institute for Space Studies, 2013; The National Academy of Sciences, 2005).

Climate change will impact regions differently and warming will not be equally distributed. Both observations and computer model predictions indicate that increases in temperature are likely to be greater at higher latitudes, where the temperature increase may be more than double the global average. Warming of surface air temperature over land will very likely be greater than over oceans (Intergovernmental Panel on Climate Change, 2013). There is also high confidence that warming relative to the reference period will be larger in the tropics and subtropics than in mid-latitudes. Frequency of warm days and nights will increase and frequency of cold days and cold nights will decrease in most regions. Warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures are more likely than increases in daily maximum temperatures. Models also predict increases in duration, intensity, and extent of extreme weather events. The frequency of both high and low temperature events is expected to increase. Near- and long-term changes are also projected in precipitation, atmospheric circulation, air quality, ocean temperatures and salinity, and sea ice cover.

Several activities contribute to the phenomena of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildland fires and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs will have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years.

### **3.1.2. Impacts from the Proposed Action**

#### **Direct and Indirect Effects**

##### **Air Quality**

The winds that frequent the southeastern part of New Mexico generally disperse odors and emissions; however, air quality would be impacted temporarily from exhaust emissions, chemical odors, dust caused by vehicles traveling to and from the project area and from motorized equipment used during construction. Impacts to air quality would diminish upon completion of the construction of the proposed action.

The EPA has the primary responsibility for regulating air quality, including seven nationally regulated ambient air pollutants. The state of New Mexico has an EPA-approved state implementation plan that regulates air quality throughout the state, except on tribal lands and within Bernalillo County. The New Mexico Air Quality Bureau's (NMAQB) mission is to protect the inhabitants and natural beauty of New Mexico by preventing the deterioration of air quality. The NMAQB is responsible for: ensuring air quality standards are met and maintained; issuing air quality Construction and Operating Permits; enforcing air quality regulations and permit conditions. Any emission source must comply with the NMAQB regulations.

Impacts to air quality on lands managed by BLM in southeastern New Mexico are reduced by the following standard practices which include: utilizing existing disturbance; minimizing surface disturbance; reclaiming and quickly establishing vegetation on areas not necessary for production; periodic watering of access roads during dry periods; removal and reuse of caliche for building other projects.

##### **Climate Change**



Climate change analyses are comprised of several factors, including GHGs, land use management practices, and the albedo effect. The tools necessary to quantify incremental climatic impacts of specific activities associated with those factors are presently unavailable. As a consequence, impact assessment of effects of specific anthropogenic activities cannot be performed. Additionally, specific levels of significance have not yet been established. Qualitative and/or quantitative evaluation of potential contributing factors within the project area is included where appropriate and practicable. When further information on the impacts to climate change in southeastern New Mexico is known, such information will be incorporated into the BLM's NEPA documents as appropriate.

Environmental and economic climate change impacts from commodity consumption are not effects of the proposed planning decisions and thus are not required to be analyzed under the NEPA. They are not direct effects, as defined by the Council on Environmental Quality (CEQ), because they do not occur at the same time and place as the action. Neither are they indirect effects because the proposed plan actions and resulting greenhouse gas emissions production are not a proximate cause of the emissions or other factors resulting from consumption. The BLM does not determine the destination of the resources produced from Federal lands. The effects from consumption are not only speculative, but beyond the scope of agency authority or control. Therefore, this document does not include analysis of the consumption of resources produced as a result of planning decisions.

### Mitigation Measures

While dust will be generated from construction equipment, once the pipeline is installed there should be little to no additional impacts to air resources.

## 3.2. Range

### 3.2.1. Affected Environment

The proposed action is within the Twin Wells #77042 grazing allotment. This allotment is a yearlong cow-calf deferred rotation operation. Range improvement projects such as windmills, earthen reservoirs, fences, and brush control projects are located within the allotment. There are fences and water pipelines that would be crossed.

Allotment/s	Improvement Type	Location	Ownership
#77042	Water Pipeline	T. 24 S., R. 31 E., sec. 17	BLM
#77042	Pasture Fence	T. 24 S., R. 31 E., sec. 16	BLM

In general, an average rating of the rangeland within this area is 6 acres per Animal Unit Month (AUM). In order to support one cow, for one year, about 72 acres are needed. This equals about nine cows per section.

### 3.2.2. Impacts from the Proposed Action

#### Direct and Indirect Effects

The temporary loss of 16.00 acres of vegetation on BLM and State managed land (plus 10.51 acres for construction only) would not affect the AUMs authorized for livestock use in this area. There are occasional livestock injuries or deaths due to accidents such as collisions with vehicles, falling into excavations, and ingesting plastic or other materials present at the work site. If further development occurs, the resulting loss of vegetation could reduce the AUMs authorized for livestock use in this area.

Where livestock water pipelines are crossed, they would either be bored under, or cut and immediately repaired to the original operating condition. Impacts to the ranching operation are reduced by standard practices such as utilizing existing surface disturbance, minimizing vehicular use, placing parking and staging areas on caliche surfaced areas, and quickly establishing vegetation on the reclaimed areas. The

pipeline would utilize SCADA communications to monitor for leaks, thereby minimizing impacts if a leak should occur.

Avoiding existing range improvement projects, or moving them if necessary, would prevent them from being damaged by the proposed action.

### **Mitigation Measures**

Throughout the life of the pipeline system, any damage to structures which provide water to livestock (caused by construction or operations of the pipeline) must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the grazing allotment holder if any damage occurs to structures that provide water to livestock.

Once construction is completed, the right-of-way will be reseeded according to the BLM requirements (seed mix #1 for loamy soils).

Where entry is granted across a fence line, the fence must be braced and tied off on both sides of the passageway with H-braces prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences. Any new gates shall be discussed with the grazing permittee and approved by the BLM.

To ensure compliance while installing the pipeline, the company shall have in their immediate possession a copy of the right-of-way grant and stipulations.

## **3.3. Soils**

### **3.3.1. Affected Environment**

The proposed action is mapped primarily as BB – Berino complex, 0 to 3 percent slopes. These are loamy soils and are described below.

Generally, these soils are deep, well-drained, moderately dark colored, calcareous, and loamy. These soils typically occur on gently undulating plains and in the broader valleys of the hills and mountains. Permeability is moderate, water-holding capacity is moderate to high, and runoff is likely after prolonged or heavy rains. Careful management is needed to maintain a cover of desirable forage plants and to control erosion. Reestablishing native plant cover could take 3-5 years due to unpredictable rainfall and high temperatures.

These soils generally have cyanobacteria throughout the area, while squamulose, crustose, and gelatinous lichens are occasionally present. These soil crusts are important in binding loose soil particles together to stabilize the soil surface and reduce erosion. Biological soil crusts can contribute positively to soil stability, fixing atmospheric nitrogen, nutrient contributions to plants, water infiltration, and plant growth. They function in the nutrient cycle by fixing atmospheric nitrogen, contributing to soil organic matter, and maintaining soil moisture. In addition, they can act as living mulch which discourages the establishment of annual/invasive weeds. Structurally they form an uneven, rough carpet that reduces rain drop impact and slows surface runoff. Below the surface, lichen and moss rhizines, fungal hyphae, and cyanobacterial filaments all act to bind the soil surface particles just below and at the surface. Horizontally, they occur in nutrient-poor areas between plant clumps. Because they lack a waxy epidermis, they tend to leak nutrients into the surrounding soil. Vascular plants such as grasses and forbs can then utilize these nutrients.

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### **3.3.2. Impacts from the Proposed Action**

#### **Direct and Indirect Impacts**

There is a potential for wind and water erosion due to the erosive nature of these soils. This is especially true if vegetative cover is lost. When pipelines carrying products such as oil, gas or produced water have leaks, it can result in decreased soil fertility, less vegetative cover, and increased soil erosion.

Impacts to soil resources are reduced by standard practices such as utilizing existing surface disturbances, minimizing vehicular use, placing parking and staging areas on caliche surfaced areas, and quickly establishing vegetation on reclaimed areas.

#### **Mitigation Measures**

Soils along the pipeline route are not considered fragile or sensitive. To ensure stability of the soils, once construction is completed, the right-of-way will be reseeded according to the BLM requirements (seed mix #1 for loamy soils). No additional mitigation measures are needed to protect soil resources.

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## **3.4. Vegetation**

### **3.4.1. Affected Environment**

This is a grassland site with warm season mid and short grass aspect. There is a fair scattering of shrubs and half-shrubs throughout the landscape. Forb production fluctuates greatly from season to season and year to year. Gramas, tridens, threeawns, muhlys, dropseeds, tobosa, and burrograss are the dominant grasses. The most common shrubs in the area are tarbush, creosote, mesquite, cactus, and yucca. Forbs include filaree, croton, bladderpod, and globemallow.

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### **3.4.2. Impacts from the Proposed Action**

#### **Direct and Indirect Impacts**

Construction of the right of way would create the temporary loss of 16.00 acres of vegetation on BLM and State managed land (plus 10.51 acres for construction only). By using the proper seed mix (seed mix #1 for loamy soils), good seedbed preparation, and proper seeding techniques, this impact would be short term (two to four growing seasons). Vegetation monitoring by BLM specialist would be used to document the reclamation progress along the ROW. When vegetation is not re-establishing in an area, BLM may require the company to do additional reseeding or other practices.

#### **Mitigation Measures**

Following standard practices such as utilizing existing surface disturbance (like the existing pipeline ROWs) and quickly establishing vegetation on the reclaimed areas, will reduce impacts to vegetation. No additional mitigation measures are required.

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## **3.5. Watershed**

### **3.5.1. Affected Environment**

The area of the proposed action on BLM is level to slightly rolling. Water infiltration is very quick with little to no runoff. Water infiltration occurs quickly with little to no runoff. The ground water recharge is from local precipitation entering through playas, sinkholes and swallets. Water quality and quantity is influenced by physical, chemical, and biological reactions that occur as water moves over and through the land surface toward streams and into aquifers. The rate at which water moves through the watershed strongly affects these reactions.

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### 3.5.2. Impacts from the Proposed Action

#### Direct and Indirect Effects

Ephemeral surface water from local rain events will wash down-slope throughout the area of the proposed action. Localized decreases in vegetative surface cover (until vegetative recovery occurs) could result in decreased infiltration rates and increased runoff volume and velocity. This can cause increased erosion, topsoil loss, and sedimentation into downstream ponds and reservoirs. Water quality can also be adversely affected following the occurrence of an undesirable event such as a leak or spill.

Standard practices or design features of the proposed project that minimize impacts to the watershed and water quality include: utilizing existing surface disturbance, minimizing blading of the right-of-way, parking and staging on areas surfaced with caliche, reclaiming any disturbed areas to quickly reestablish vegetation and using SCADA communications to monitor the pipeline system.

#### Mitigation Measures

To ensure stability of the soils, once construction is completed, the right-of-way will be reseeded according to the BLM requirements (seed mix #1 for loamy soils) attached to the grant. No additional mitigation measures are needed to protect soil resources.

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## 3.6. Wildlife

### 3.6.1. Affected Environment

This project occurs in the sand shinnery habitat type. Sand shinnery communities extend across the southern Great Plains occupying sandy soils in portions of north and west Texas, west Oklahoma, and southeast New Mexico. Portions of Eddy, Lea and Chaves counties consist largely of sand shinnery habitat and are intermixed with areas of mesquite to a lesser degree. The characteristic feature of these communities is co-dominance by shinnery oak and various species of grasses. In New Mexico Shinnery oak occurs in sandy soil areas, often including sand dunes.

Various bird, mammal, reptile and invertebrate species inhabit the sand shinnery ecosystem in New Mexico. Herbivorous mammals include mule deer, pronghorn, and numerous rodent species. Carnivores include coyote, bobcat, badger, striped skunk, and swift fox. Two upland game bird species, scaled quail and mourning dove, are prevalent throughout the sand shinnery in New Mexico. Many species of songbirds nest commonly, with a much larger number that use the habitat during migration or for non-nesting activities. Common avian predators include northern harrier, Swainson's hawk, red-tailed hawk, kestrel, burrowing owl, and Chihuahuan raven. Numerous snake and lizard species have been recorded, including the sand dune lizard, the only vertebrate species restricted entirely to sand shinnery habitat.

#### Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*)

In New Mexico, the lesser prairie-chicken (LPC) formerly occupied a range that encompassed the easternmost one-third of the state, extending to the Pecos River, and 48 km west of the Pecos near Fort Sumner. This covered about 38,000 km<sup>2</sup>. By the beginning of the 20<sup>th</sup> Century, populations still existed in nine eastern counties (Union, Harding, Chaves, De Baca, Quay, Curry, Roosevelt, Lea, and Eddy). The last reliable records from Union County are from 1993. Currently, populations exist only in parts of Lea, Eddy, Curry, Chaves, and Roosevelt counties, comprising about 23% of the historical range.

LPC are found throughout dry grasslands that contained shinnery oak or sand sage. Currently, they most commonly are found in sandy-soiled, mixed-grass vegetation, sometimes with short-grass habitats with clayey or loamy soils interspersed. They occasionally are found in farmland and smaller fields, especially in winter. Shinnery oak shoots are used as cover and produce acorns, which are important food for LPC and many other species of birds, such as the scaled quail, northern bobwhite, and mourning dove. Current geographic range of shinnery oak is nearly congruent with that of the lesser prairie-chicken, and these species sometimes are considered ecological partners. Population densities of LPC are greater in shinnery oak habitat than in sand sage habitat.

LPC use a breeding system in which males form display groups. These groups perform mating displays on arenas called leks. During mating displays male vocalizations called booming, attract females to the lek. Leks are often on knolls, ridges, or other raised areas, but in New Mexico leks are just as likely to be on flat areas such as roads, abandoned oil drill pads, dry playa lakes or at the center of wide, shallow depressions. Leks may be completely bare, covered with short grass, or have scattered clumps of grass or short tufts of plants. An important physical requirement for location of leks is visibility of surroundings, but the most important consideration is proximity of suitable nesting habitat, breeding females and the ability to hear male vocalizations.

In the late 1980s, there were 35 documented active booming grounds known to exist within the CFO. Due to population decreases and unpredictable weather cycles the LPC is currently proposed for federal listing, and potentially may become extirpated from Eddy and southern Lea counties. The last documented sighting within the Carlsbad field office boundaries was on March 15<sup>th</sup> 2011.

In June 1998, the US Fish and Wildlife Service (USFWS) issued a statement regarding their status review of the lesser prairie-chicken. It stated, "Protection of the lesser prairie-chicken under the Federal Endangered Species Act (ESA) is warranted but precluded which means that other species in greater need of protection must take priority in the listing process." Given the current Federal Candidate status of this species, the Bureau of Land Management is mandated to carry out management consistent with the principles of multiple use, for the conservation of candidate species and their habitats, and shall ensure that actions authorized, funded, or carried out do not contribute to the need to list any of these species as Threatened or Endangered (Bureau Manual 6840.06). On December 11, 2012, the USFWS proposed to list the lesser prairie-chicken as a threatened species under the ESA of 1973, as amended. On March 27, 2014, the USFWS in response to the rapid and severe decline of the lesser prairie-chicken announced the final listing of the species as threatened under the ESA, as well as a final special rule under section 4(d) of the ESA that will limit regulatory impacts on landowners and business from the listing. Currently, the USFWS has not determined or designated critical habitat regarding the lesser prairie-chicken. The final rule to list the lesser prairie-chicken as threatened was published in the *Federal Register* on April 10, 2014, and became effective on May 12, 2014. On July 20, 2016, the U.S. Fish and Wildlife Service formally removed the lesser prairie chicken from protection under the Endangered Species Act. Prescribed management for the species still follows BLM Resource Management Plan guidelines.

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### **3.6.2.Impacts from the Proposed Action**

#### **Direct and Indirect Impacts**

CEHMM conducted raptor/burrowing owl surveys of the MarkWest Salado Draw 3 and 4 on April 27 and 28, 2020 per BLM regulations. Transects spaced 50m apart were followed, encompassing a 200m buffer around the proposed project. One inactive raptor nest was observed. In addition, one burrowing owl was flushed from a burrow on State land during the survey of the proposed project. The complete results of the biological survey are shown in Appendix A.

Impacts of the proposed action to wildlife in the localized area may include but are not limited to: possible mortality, habitat degradation and fragmentation, avoidance of habitat during construction and drilling activities and the potential loss of burrows and nests.

Standard practices and elements of the proposed action minimize these impacts to wildlife. These include: the NTL-RDO 93-1(modification of open-vent exhaust stacks to prevent perching and entry from birds and bats), nets on open top production tanks, interim reclamation, closed loop systems, exhaust mufflers, berming collection facilities, minimizing cut and fill, road placement, and avoidance of wildlife waters, stick nests, drainages, playas and dunal features. These practices reduce mortality to wildlife and allow habitat to be available in the immediate surrounding area thus reducing stressors on wildlife populations at a localized level. Impacts to local wildlife populations are therefore expected to be minimal.

#### **Special Status Species**



**Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*)**

Impacts of the proposed action to LPC in the localized area may include but are not limited to: disruptions in breeding cycles, habitat degradation and fragmentation, avoidance of habitat during construction and drilling activities and potential loss of nests. Noise and human activity generated from construction activity could impact the LPC by reducing the establishment of seasonal "booming grounds" or leks, thus possibly reducing reproductive success in the species. It is believed that the noise generated by construction activity and human presence could mask or disrupt the booming of the male prairie-chicken and thus inhibiting the females from hearing the booming. In turn, female LPC would not arrive at the booming ground, and subsequently, there would be decreased courtship interaction and possibly decreased reproduction. Decreased reproduction and the loss of recruitment into the local population would result in an absence of younger male LPC to replace mature male LPC once they expire, eventually causing the lek to disband and become inactive. Additionally, habitat fragmentation caused by development could possibly decrease the habitat available for nesting, brooding and feeding activities.

The CFO takes every precaution to ensure that active booming grounds and nesting habitats are protected by applying a timing and noise condition of approval within portions of suitable and occupied habitat for the LPC. It is not known at this time whether active booming grounds or nest locations are associated with this specific location. Only after survey efforts during the booming season are conducted, will it be known whether an active lek is in close proximity (within 1.5 miles) of the proposed location or not.

Exceptions to timing and noise requirements will be considered in emergency situations such as mechanical failures, however, these exceptions will not be granted if BLM determines, on the basis of biological data or other relevant facts or circumstances, that the grant of an exception would disrupt LPC booming activity during the breeding season. Requests for exceptions on a non-emergency basis may also be considered, but these exceptions will not be granted if BLM determines that there are prairie-chicken sightings, historic leks and or active leks within 1.5 miles of the proposed location, or any combination of the above-mentioned criteria combined with suitable habitat.

In light of the circumstances under which exceptions may be granted, minimal impacts to the LPC are anticipated as a result of the grant of exceptions to the timing limitation for LPC Condition of Approval. On account of these requirements and mitigation measures as below, minimal impacts to the LPC are anticipated as a result of oil and gas activity.

**Candidate Conservation Agreement**

While the applicant of this pipeline ROW is not an enrolled participant, the proposed action is in support of lease field development for oil & gas lease holders who are Participating Cooperators in the CCA for the lesser prairie-chicken (*Tympanuchus pallidicinctus*) and dunes sagebrush lizard (*Sceloporus arenicolus*).

The goal of the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (USFWS), Center of Excellence for Hazardous Materials Management (CEHMM) and the Participating Cooperator is to reduce and/or eliminate threats to the LPC and/ or SDL. By agreeing to conduct the conservation measures described by the CCA, the Participating Cooperator contributes funding or provides in-kind services for conservation.

The Certificate of Participation (CP) associate with the CCA is voluntary between CEHMM, BLM, USFWS and the Participating Cooperator. Through the CP, the Participating Cooperator voluntarily commits to implement or fund specific conservation actions that will reduce and/or eliminate threats to the SDL and /or the LPC. Funds contributed as part of the CP will be used to implement conservation measures and associated activities. The funds will be directed to the highest priority projects to restore or reclaim habitat at the sole discretion of BLM and USFWS.

The following Conservation Measures are to be accomplished in addition to those described in the CCA and Pecos District Special Status Species Resource Management Plan Amendment (RMPA):

1. To the extent determined by the BLM representative at the Plan of Development stage, all infrastructures supporting the development of a well (including roads, power lines, and pipelines) will be constructed within the same corridor.
2. On enrolled parcels that contain inactive wells, roads and/or facilities that are not reclaimed to current standards, the Participating Cooperator shall remediate and reclaim their facilities within three years of executing this CP, unless the Cooperator can demonstrate they will put the facilities back to beneficial use for the enrolled parcel(s). If an extension is requested by the Cooperator, they shall submit a detailed plan (including dates) and receive BLM approval prior to the three-year deadline. All remediation and reclamation shall be performed in accordance with BLM requirements and be approved in advance by the Authorized Officer.
3. Utilize alternative techniques to minimize new surface disturbance when required and as determined by the BLM representative at the Plan of Development stage.
4. Install fence markings along fences owned, controlled, or constructed by the Participating Cooperator that cross through occupied habitat within two miles of an active LPC lek.
5. Bury new powerlines that are within two (2) miles of LPC lek sites active at least once within the past five years (measured from the lek). The avoidance distance is subject to change based on new information received from peer reviewed science.
6. Bury new powerlines that are within one (1) mile of historic LPC lek sites where at least one LPC has been observed within the past three years (measured from the historic lek). The avoidance distance is subject to change based on new information received from peer reviewed science.
7. Management recommendations may be developed based on new information received from peer reviewed science to mitigate impacts from H<sub>2</sub>S and/or the accumulation of sulfates in the soil related to production of gas containing H<sub>2</sub>S on the LPC. Such management recommendations will be applied by the Participating Cooperator as Conservation Measures under this CI/CP in suitable and occupied SDL/LPC habitat where peer-reviewed science has shown that H<sub>2</sub>S levels threaten the LPC.

#### **Mitigation Measures and Residual Impacts**

To protect a burrowing owl burrow on State land in T. 24 S., R. 31 E. section 16: SE¼SW¼ (Waypoint 2158), no pipeline construction will occur from March 1st through August 31 within 200 meters of the nest.

### **3.7. Noxious Weeds and Invasive Plants**

#### **3.7.1. Affected Environment**

There are four plant species within the CFO that are identified in the New Mexico Noxious Weed List and Noxious Weed Management Act of 1998. These species are African rue, Malta starthistle, Russian olive, and salt cedar. African rue and Malta starthistle populations have been identified throughout the Carlsbad Field Office and mainly occur along the shoulders of highway, state and county roads, lease roads and well pads (especially abandoned well pads). The CFO has an active noxious weed monitoring and treatment programs, and partners with county, state and federal agencies and industry to treat infested areas with chemical and monitor the counties for new infestations.

#### **3.7.2. Impacts from the Proposed Action**

##### **Direct and Indirect Impacts**

Any surface disturbance could increase the possibility of establishment of new populations of invasive, non-native species. The installation of the proposed pipeline could have minimal contribution to the establishment and spread of Malta starthistle but could impact the spread of African rue. The main mechanism for seed dispersion would be by equipment and vehicles that were previously used and/or driven across noxious weed infested areas. However, noxious weed seed could be carried to and from the project area by construction equipment and transport vehicles.

### **Mitigation Measures**

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## **3.8. Cultural and Historical Resources**

### **3.8.1. Affected Environment**

The project falls within the Southeastern New Mexico Archaeological Region. This region contains the following cultural/temporal periods: Paleoindian (ca. 11,500 – 7,000 B.C.), Archaic (ca. 6,000 B.C. – A.D. 500), Ceramic (ca. A.D. 500 – 1400), Post Formative Native American (ca. A.D. 1400 – present), and Historic Euro-American (ca. A.D. 1865 to the present). Sites representing any or all of these periods are known to occur within the region. A more complete discussion can be found in *Permian Basin Research Design 2016-2026 Volume I: Archaeology and Native American Cultural Resource published in 2016 by SWCA Environmental Consultants, Albuquerque, New Mexico.*

#### Native American Religious Concerns

The BLM conducts Native American consultation regarding Traditional Cultural Places (TCP) and Sacred Sites during land-use planning and its associated environmental impact review. In addition, during the oil & gas lease sale process, Native American consultation is conducted to identify TCPs and sacred sites whose management, preservation, or use would be incompatible with oil and gas or other land-use authorizations. With regard to Traditional Cultural Properties, the BLM has very little knowledge of tribal sacred or traditional use sites, and these sites may not be apparent to archaeologists performing surveys in advance of drilling.

### **3.8.2. Impacts from the Proposed Action**

#### **Direct and Indirect Effects**

#### **PERMIAN BASIN PA INSERT FOR DIRECT AND INDIRECT IMPACTS:**

The project falls within the area covered by the Permian Basin Programmatic Agreement (PA). The Permian Basin PA is an optional method of compliance with Section 106 of the National Historic Preservation Act for energy related projects in a 39-quadrangle area of the Carlsbad Field Office. The PA is a form of off-site mitigation which allows industry to design projects to avoid known NRHP eligible cultural resources and to contribute to a mitigation fund in lieu of paying for additional archaeological inventory in this area that has received adequate previous survey. Funds received from the Permian Basin PA will be utilized to conduct archaeological research and outreach in Southeastern New Mexico. Research will include archaeological excavation of significant sites, predictive modeling, targeted research activities, as well as professional and public presentations on the results of the investigations.

The proponent chose to participate in the Permian Basin PA by planning to avoid all known NRHP eligible and potentially eligible cultural resources. The proponent has contributed funds commensurate to the undertaking into an account for offsite mitigation. Participation in the PA serves as mitigation for the effects of this project on cultural resources. If any skeletal remains that might be human or funerary

objects are discovered by any activities, the project proponent will cease activities in the area of discovery and notify the BLM within 24 hours as required by the Permian Basin PA.

#### **NON PERMIAN INSERT FOR DIRECT AND INDIRECT IMPACTS:**

Cultural resources on public lands, including archaeological sites and historic properties, are protected by federal law and regulations (Section 106 of the National Historic Preservation Act and the National Environmental Policy Act). Class III cultural surveys will be conducted of the area of effect for realty or oil and gas projects proposed on these lands prior to the approval of any ground disturbing activities to identify any resources eligible for listing on the National Register of Historic Places. Cultural resource inventories minimize impacts to cultural sites and artifacts by avoiding these resources prior to construction of the proposed project. If unanticipated or previously unknown cultural resources are discovered at any time during construction, all construction activities shall halt and the BLM authorized officer will be immediately notified. Work shall not resume until a Notice to Proceed is issued by the BLM.

A Class III cultural resource inventory (NCRIS No. 145583) was conducted on State Land. No historic properties were identified within the area of potential effect.

#### **Mitigation Measures**

If any skeletal remains that might be human or funerary objects are discovered by any activities, the project proponent will cease activities in the area of discovery and notify the BLM within 24 hours as required by the Permian Basin PA.

### **3.9. Paleontology**

#### **3.9.1. Affected Environment**

Paleontological resources are any fossilized remains, traces, or imprints of organisms, preserved in or on the earth's crust, that are of paleontological interest and that provide information about the history of life on earth. Fossil remains may include bones, teeth, tracks, shells, leaves, imprints, and wood.

Paleontological resources include not only the actual fossils but also the geological deposits that contain them and are recognized as nonrenewable scientific resources protected by federal statutes and policies.

The primary federal legislation for the protection and conservation of paleontological resources occurring on federally administered lands are the Paleontological Resources Preservation Act of 2009 (PRPA), the Federal Land Policy and Management Act of 1976 (FLPMA), and the National Environmental Policy Act of 1970 (NEPA). BLM has also developed policy guidelines for addressing potential impacts to paleontological resources (BLM, 1998a, b; 2008, 2009). In addition, paleontological resources on state trust lands are protected by state policy from unauthorized appropriation, damage, removal, or use.

The Potential Fossil Yield Classification (PFYC) is a tool that allows the BLM to predict the likelihood of a geologic unit to contain paleontological resources. The PFYC is based on a numeric system of 1-5, with PFYC 1 having little likelihood of containing paleontological resources, whereas a PFYC 5 value is a geologic unit that is known to contain abundant scientifically significant paleontological resources. The fossil resources of concern in this area are the remains of vertebrates, which include species of fish, amphibians, and mammals.

#### **3.9.2. Impacts from the Proposed Action**

##### **Direct and Indirect Effects**

The project is in PFYC 2, where management concern is negligible.

Direct impacts would result in the immediate physical loss of scientifically significant fossils and their contextual data. Impacts indirectly associated with ground disturbance could subject fossils to damage or destruction from erosion, as well as creating improved access to the public and increased visibility,

potentially resulting in unauthorized collection or vandalism. However, not all impacts of construction are detrimental to paleontology. Ground disturbance can reveal significant fossils that would otherwise remain buried and unavailable for scientific study. In this manner, ground disturbance can result in beneficial impacts. Such fossils can be collected properly and curated into the museum collection of a qualified repository making them available for scientific study and education.

### **Mitigation Measures**

There are no mitigation measures for this project, as currently proposed.

## **3.10. Visual Resource Management**

### **3.10.1. Affected Environment**

The Visual Resource Management (VRM) program identifies visual values, establishes objectives in the RMP for managing those values, and provides a means to evaluate proposed projects to ensure that visual management objectives are met.

This project occurs within the Visual Resource Management Class IV zone on BLM lands. The objective of VRM Class IV is to provide management for activities that require major modifications of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic landscape elements of color, form, line and texture.

### **3.10.2. Impacts from the Proposed Action**

#### **Direct and Indirect Effects**

While this proposed project is in an area already highly impacted by existing oil and gas activity, it would cause some short term and long-term visual impacts to the natural landscape. Short term impacts occur during construction operations. These include the presence of construction equipment and vehicle traffic.

Long term impacts are visible to the casual observer through the life of the pipeline and pad site. These include the visual evidence of a bladed right-of-way which cause visible contrast to form, line, color, and texture. Those contrasts would be visible to visitors in the area.

After final abandonment, above ground components of the pipeline would be removed, reclaimed, re-contoured and re-vegetated, if necessary, thereby eliminating visual impacts.

Short and long-term impacts can be minimized by best management practices such as utilizing existing surface disturbance and color selection and screening of facilities with natural features and vegetation.

### **Mitigation Measures**

The buried pipeline would create a scar that would be visible to the casual observe until it is reclaimed. To minimize this visual contrast, the right-of-way grant will require the company to reseed the area utilizing seed mix #1 for loamy soils.

## **3.11. Impacts from the No Action Alternative**

The No Action Alternative is used as the baseline for comparison of environmental effects of the analyzed alternatives. Under the No Action Alternative, the proposed pipeline project would not be constructed and there would be no new direct or indirect impacts to natural or cultural resources from installation of the pipeline system. The natural and cultural resources in the project area would continue to be managed under the current land and resource uses. However, since produced natural gas would still need to be



disposed of by oil and gas leasees in the area, it would likely be flared on site. This would result in the loss of the resource and potential impacts to the environment.

### 3.12. Cumulative Impacts

Cumulative impacts are the combined effect of past projects, specific planned projects, and other reasonably foreseeable future actions within the project study area to which oil and gas exploration and development may add incremental impacts. This includes all actions, not just oil and gas actions that may occur in the area including foreseeable non-federal actions. This proposed project is only a small component of the high level of drilling and development ongoing in the area. The Reasonably Foreseeable Development Scenario in the 2008 Special Status Species Approved Resource Management Plan Amendment attempts to capture the boom and bust nature of oil and gas development in the Permian Basin. Because pipeline systems like this one are the only means of transporting natural gas to market, these types of projects will continue to be seen on all land ownership types in Eddy and Lea counties, as well as to the south in Texas.

The combination of all land use practices across a landscape has the potential to change the visual character, disrupt natural water flow and infiltration, disturb cultural sites, cause minor increases in greenhouse gas emissions, fragment wildlife habitat and contaminate groundwater. However, the likelihood of these impacts occurring is minimized through standard mitigation measures, special Conditions of Approval, SCADA communications and ongoing monitoring studies.

While all resources are expected to sustain some level of cumulative impacts over time, these impacts would fluctuate with the gradual abandonment and reclamation of wells and associated infrastructure in the area. As an example, as new wells are being drilled, there are other wells being abandoned and reclaimed. As the oil field is depleted, the cumulative impacts would lessen as more areas are reclaimed and fewer areas are developed.

The Proposed Action would not have any potential to significantly impact environmentally sensitive areas. The route is not located within an established National Wildlife Refuge, conservation easements or conservation reserve program lands, designated Wilderness Area or Wilderness Study Area, National Monument, National Park, Marine Sanctuary, Area of Critical Environmental Concern or designated critical wildlife habitat.

## 4. SUPPORTING INFORMATION

### 4.1. List of Preparers

Prepared by: Douglas J. Burger  
Legacy Land and Environmental Solutions, LLC

Date: 5/8/20

The following individuals aided in the preparation of this document:

- June Hernandez, Realty Specialist, BLM-CFO
- Lu Burger, Legacy Land and Environmental Solutions, LLC

### 4.2. References

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## 5. APPENDICES

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### 5.1. Appendix A – Biological Survey MarkWest Chevron Sand Dunes Project

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**CEHMM**

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**Chevron Sand Dunes Pipeline**

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**BIOLOGICAL SURVEY REPORT**

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**Mark West**

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**4/30/2020**

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**Summary:**

CEHMM conducted raptor/burrowing owl survey of the Chevron Sand Dunes Pipeline project on April 27 and 28, 2020 per BLM regulations. Transects for the raptor/burrowing owl survey spaced 50 meters apart were followed, encompassing a 200-meter buffer around the proposed project on federal and private lands.

2

One inactive raptor nest was observed during the survey, see Figure 2. One burrowing owl (*Athene cunicularia*) was flushed from a burrow during the survey, see Figure 3. The BUOW burrow was 36 meters from the center line of the project.

2

It is important to note that the proposed project is located in the Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) (LPC) Isolated Population Area and the project lies within Shinnery Oak (*Quercus havardii*) an important environmental feature for LPC habitat.

2

2

Table 1: Wildlife Observations

Observations	Waypoint	UTMN	UTME	Distance from CL	Observation
Raptor Nest: Inactive (IA)	2157	3564714.8	613288.7	71m N	Inactive and dilapidated.
Burrowing Owl	2158	3564777.0	614545.1	36m W	One BUOW flushed from burrow.

2

2

2

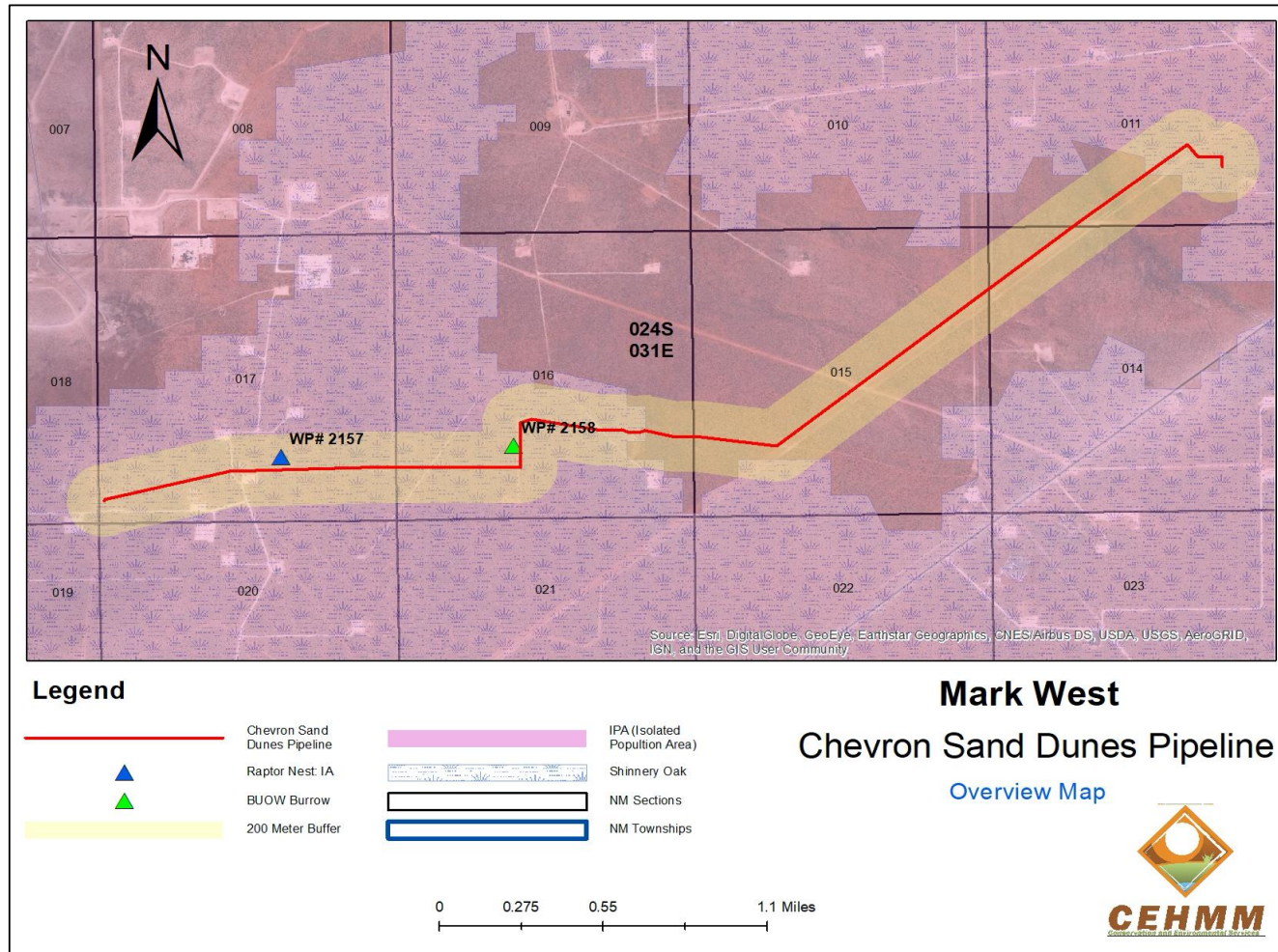


Figure 1. Overview map of the proposed project.

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Figure 2: Photo of inactive raptor nest. WP# 2157

2



Figure 3: Photo of BUOW burrow WP# 2158

4



Figure 4. Beginning of Line



Figure 5. End of Line

5





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

CONDITIONS

Action 132286

**CONDITIONS**

Operator: CHEVRON U S A INC 6301 Deauville Blvd Midland, TX 79706	OGRID: 4323
	Action Number: 132286
	Action Type: [C-144] Temporary Pit Plan (C-144T)

**CONDITIONS**

Created By	Condition	Condition Date
jburdine	NMOCD has reviewed and approved the [C-144] Temporary Pit Plan permit, Application ID #132286, and related documents submitted by [4323] CHEVRON USA INC, Application and Form C-144 received on August 9, 2022, for the proposed JAVELINA UNIT 601 (601H, 602H, 603H, 501H, 502H) [fJMB2222150892], Temporary Pit in Unit Letter D, Section 9, Township 24S, Range 31E, Eddy County, New Mexico. The application is approved with conditions.	8/9/2022