# C-144 Permit Package
# Javelina Unit P433, Temporary Pit
# Section 12 of T24S, R31E, Eddy County

Javelina Unit / 433H
Javelina Unit / 434H
Javelina Unit / 435H

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

May 2, 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 P433 (433H, 434H, 435H)
Section 12 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 067106 located in Section 12, 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

Jonathon Fisher
Wells Engineer
JonathonFisher@chevron.com

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

**Chevron USA Incorporated**
Chevron USA Inc.
6301 Deauville Blvd
Midland, TX 79706
Tel 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 NMOCD District Office.
**For permanent pits** submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD 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 433 (433H, 434H, 435H)**
API Number: **Pending** OCD Permit Number: **FACILITY ID [fVV2214553037]**
U/L or Qtr/Qtr **E** Section **12** Township **24S** Range **31E** County: **Eddy**
Center of Proposed Design: Latitude **32.23256** Longitude **-103.73652** 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 15,400 bbl, 1 x 7,700 bbl** Dimensions: L **251 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.

**Variances 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.**<br>- ☐ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells | ☐ Yes ☐ No<br>☒ NA |
| **Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit .**<br>- ☒ NM Office of the State Engineer - iWATERS database search; ☒ USGS; ☐ Data obtained from nearby wells<br>**See Appendices A, B, Figure 7** | ☐ Yes ☒ No<br>☐ NA |
| 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)**<br>- Written confirmation or verification from the municipality; Written approval obtained from the municipality<br>**See Figures 2 & 7** | ☐ Yes ☒ No |
| Within the area overlying a subsurface mine. **(Does not apply to below grade tanks)**<br>- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division<br>**See Figure 4** | ☐ Yes ☒ No |
| Within an unstable area. **(Does not apply to below grade tanks)**<br>- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map<br>**See Figures 6, 8, 9, Appendix G** | ☐ Yes ☒ No |
| Within a 100-year floodplain. **(Does not apply to below grade tanks)**<br>- FEMA map<br>**See Figure 3** | ☐ Yes ☒ No |
| **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).<br>- Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;.<br>- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| **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.)<br>- Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 300 feet from a occupied 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 | ☐ Yes ☐ No |

| | |
|---|---|
| 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 300feet of any other fresh water well or spring, in existence at the time of the initial application.<br>NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 100 feet of a wetland.<br>- 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).<br>- Topographic map; Visual inspection (certification) of the proposed site<br>**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.<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image<br>**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;<br>- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site<br>**See Appendices A, B, and Figures 1 & 2** | ☐ Yes ☒ No |
| Within 300 feet of a wetland.<br>- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site<br>**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).<br>- 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.<br>- 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.<br>- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 500 feet of a wetland.<br>- 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 $H_2S$, 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>**See Appendices A & B, and Figure 7** | ☐ Yes ☒ No<br>☐ 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>**See Appendices A & B, and Figure 7** | ☐ Yes ☒ No<br>☐ 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>**See Appendices A & B, and Figure 7** | ☒ Yes ☐ No<br>☐ 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>**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.<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image<br>**See Figure 2** | ☐ Yes ☒ 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. | ☐ Yes ☒ No |

| | |
|---|---|
| - NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site **See Appendices A & B, and Figure 7** | |
| Written confirmation or verification from the municipality; Written approval obtained from the municipality | ☐ 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 |
| 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. - Written confirmation or verification from the municipality; Written approval obtained from the municipality **See Figure 2** | ☐ Yes ☒ No |
| Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division **See Figure 4** | ☐ Yes ☒ No |
| Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map **See Figures 6, 8, & 9, Appendix G** | ☐ Yes ☒ No |
| Within a 100-year floodplain. - FEMA map **See Figure 3** | ☐ Yes ☒ 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: 05/02/2022

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:** Victoria Venegas **Approval Date:** 05/25/2022

**Title:** Environmental Specialist **OCD Permit Number:** FACILITY ID [fVV2214553037]

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 P433 Pit

Section 12, 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 20 to 454 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 20 ft or more bgs.

- The nearest USGS-gauged water well to the pit location is located approximately 2.8 miles to the north and is completed in the Dewey Lake Redbeds. In 2012, the water level was gauged at a depth of 100' bgs as reported in the USGS database.

- To the southwest, a USGS-gauged water well is located approximately 4.4 miles from the proposed pit location and is completed in the Rustler Formation. In 1959, the water level was gauged at a depth of 474' bgs as reported in the USGS database.

- To the south, a USGS-gauged water well is located approximately 4.6 miles from the proposed pit location and is completed in the Seven Rivers Formation. In 1998, the water level was gauged at a depth of 406' bgs as reported in the USGS database.

- Farther to the south, a USGS-gauged well is located approximately 4.9 miles away and is completed in the Rustler Formation. Water level was gauged at 390' bgs in 1976 as reported in the USGS database.

- To the east, the nearest well is located approximately 4.2 miles away and is completed in the Alluvium. A water level of 20' bgs in 2006 is reported in the USGS database for this well.

- Another USGS-gauged well is located approximately 4.2 miles east-northeast of the proposed pit location. This well is completed in the Santa Rosa Sandstone and a water level of 454 feet bgs in 1976 was reported for this well in the USGS database.

Seven water wells located within 5 miles of the temporary pit were gauged by NMOSE at > 40 ft bgs.

- The nearest water well to the pit location is located approximately 1.4 miles to the southwest and is completed in the Rustler Formation. A water level of 850 ft bgs was reported by the NMOSE for this well.
- Farther to the southwest at a distance of 1.7 miles, another water NMOSE-gauged water well is completed in the Rustler Formation. A water level of 868 ft bgs is reported in the NMOSE database.
- To the northwest, the nearest well is located 1.4 miles away and appears to be completed in the Santa Rosa Formation. Water level was reported at 160 ft bgs in the NMOSE database.
- Another Santa Rosa well is located approximately 1.4 miles northwest of the temporary pit with a reported water level of 205 feet in the NMOSE database.
- Farther to the north, a NMOSE-gauged well is located approximately 2.8 miles away and appears to be completed in the Rustler Formation. A water level of 430 ft bgs is reported in the NMOSE database for this well.
- Another NMOSE well is shown approximately 2.8 miles northeast of the proposed pit location. This well appears to be completed in the Rustler Formation. A water level of 380 ft bgs is reported in the NMOSE database for this well.
- To the southeast at approximately 5 miles from the proposed pit location, a NMOSE-gauged well is completed in possibly the Rustler Formation or Santa Rosa Sandstone. A water level of 314 ft bgs is reported in the NMOSE database.
- 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 1-mile northwest 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 12 miles west of the pit location.
- There are NHD features (ephemeral) approximately 3 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 19.5 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[1]). 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.

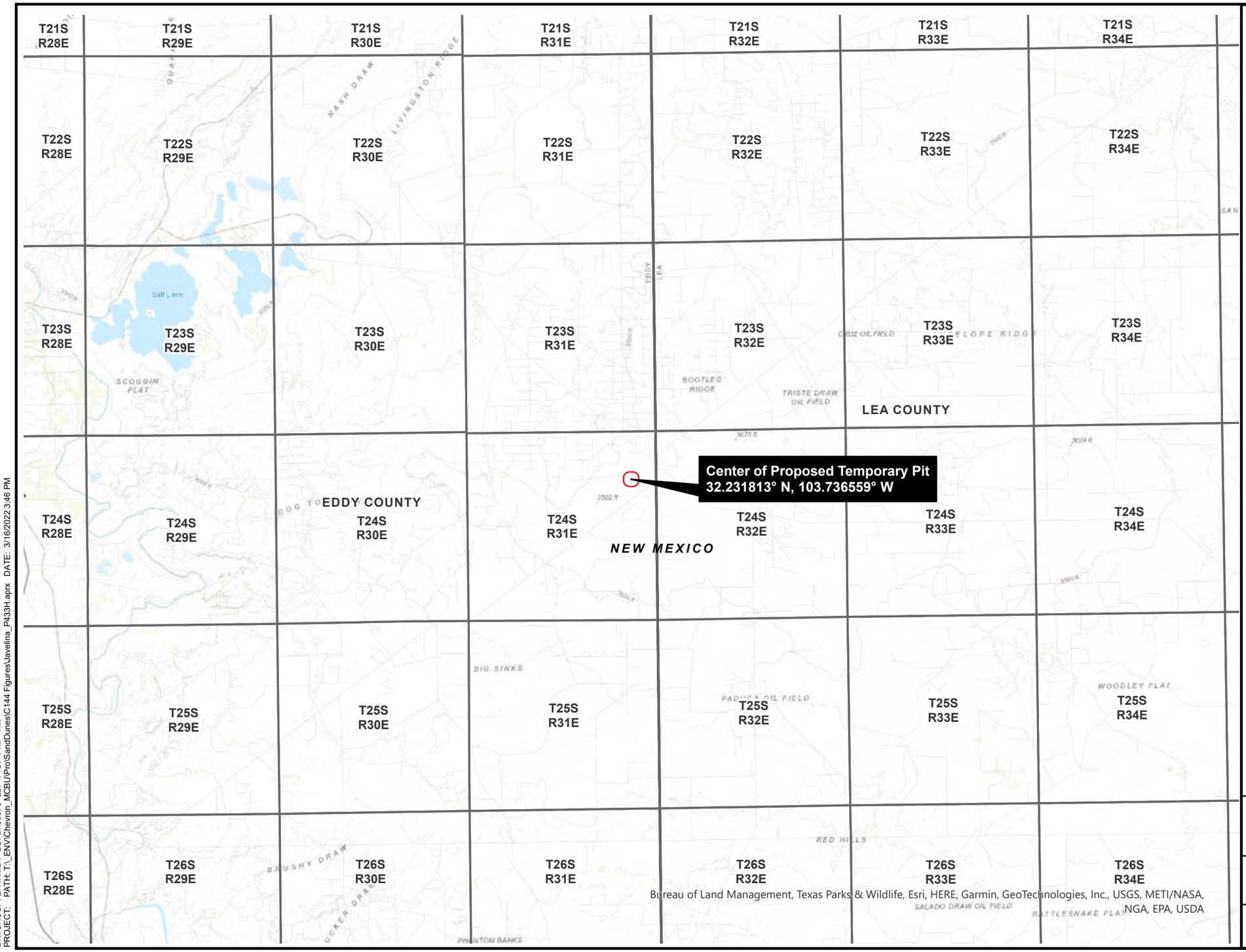
[1] Crowl, W. J., D. E. Hulse, and G. Tucker, P.E., 2011. NI 43-101 Technical Report Prefeasibility Study for the Ochoa Project, Lea County, New Mexico. Prepared for IC Potash Corporation by Gustavsen and Associates, December 30, 2011, 301 p.

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

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, T24S, R31E




## LEGEND

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

0 3 6

Miles

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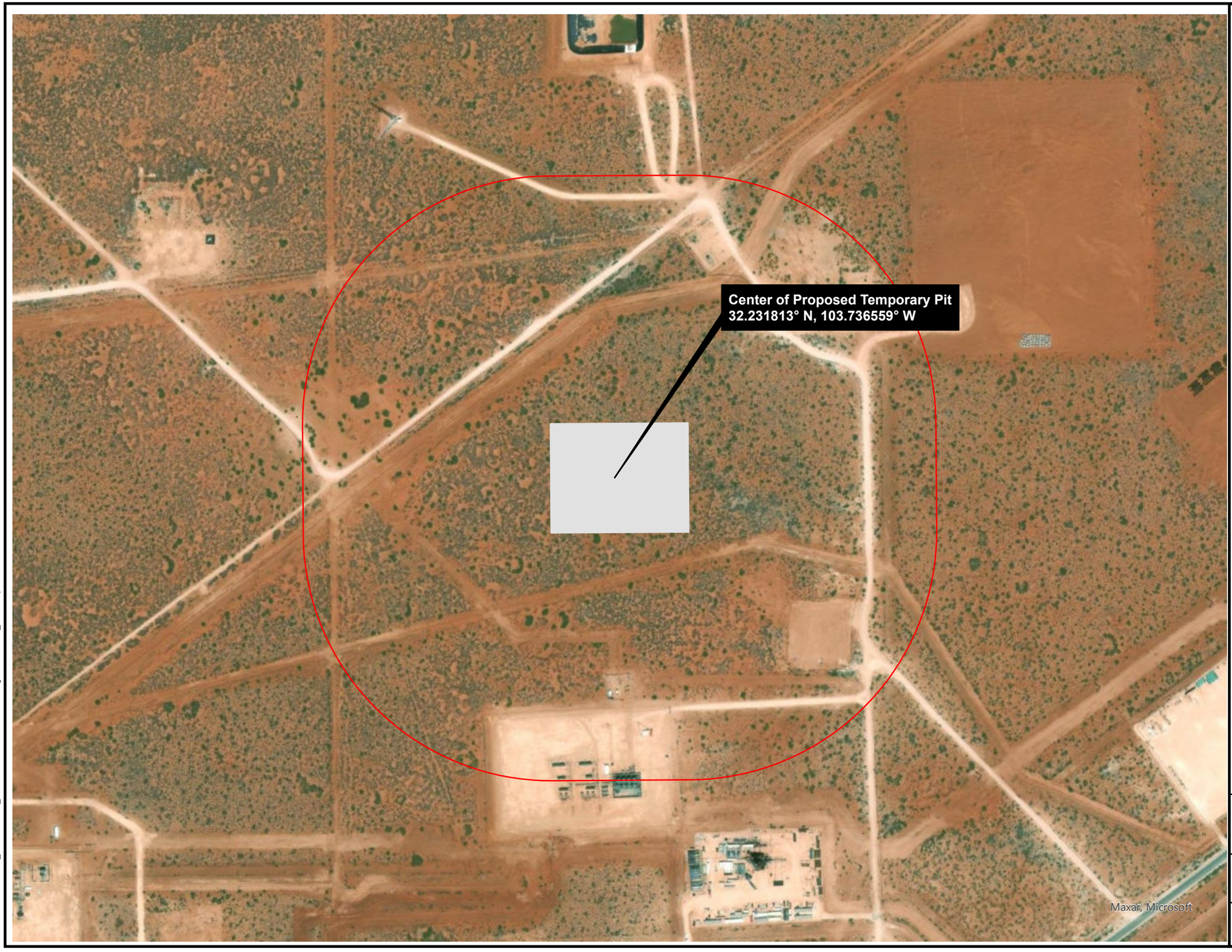
ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

## VICINITY MAP

ARCADIS

FIGURE 1

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\ProjSandDunes\C144 Figures\Javelina_P433H.aprx DATE: 3/16/2022 3:46 PM




## LEGEND

Proposed Temporary Pit

1,000 ft Buffer

0 300 600

Feet

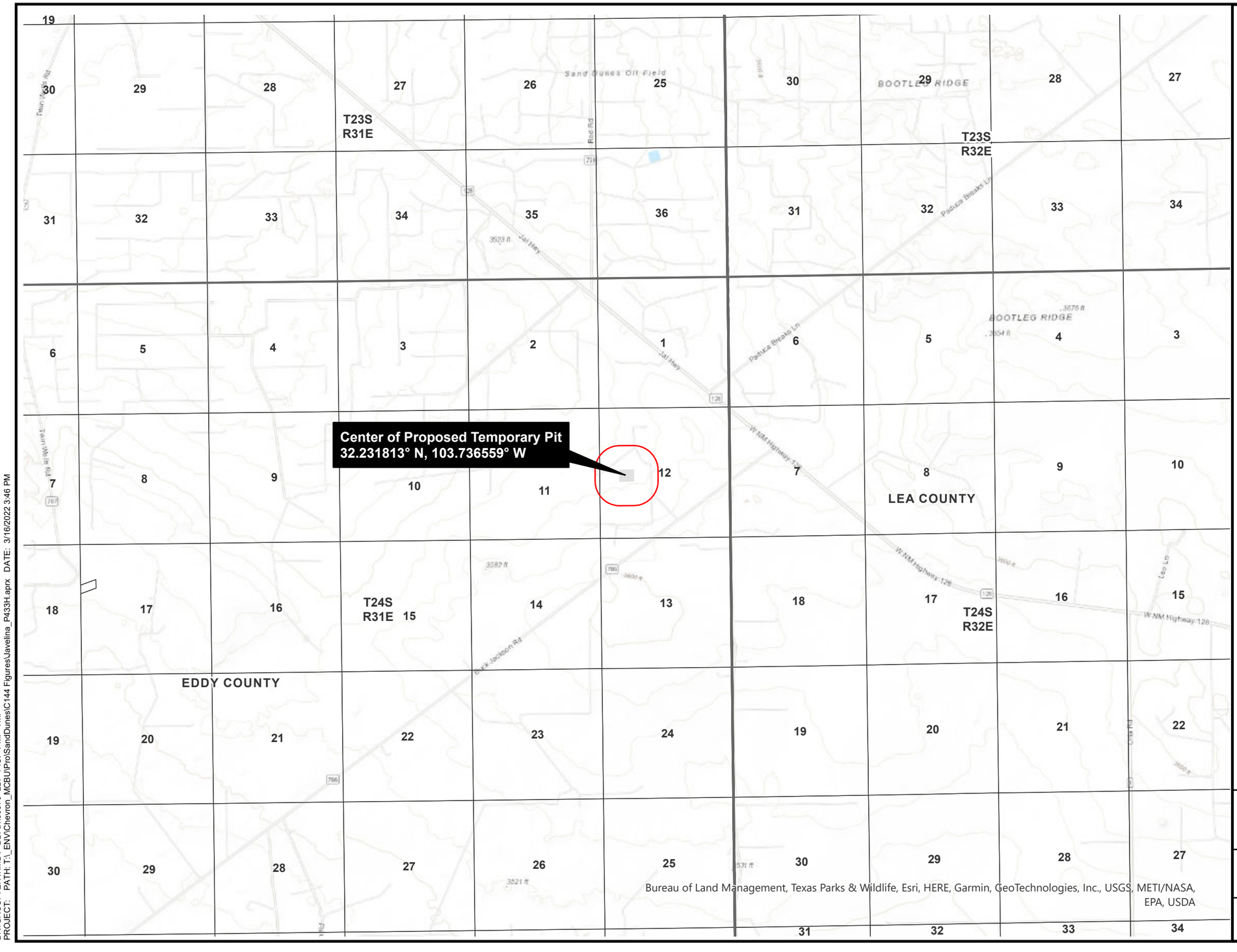
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

**SITE OVERVIEW**

ARCADIS

FIGURE 2

DIV/GROUP: ENV/IMDV DB: avl00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\Pro\SandDunes\C144 Figures\Javelina_P433H.aprx DATE: 3/16/2022 3:46 PM




## LEGEND

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

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

0 3,000 6,000
Feet

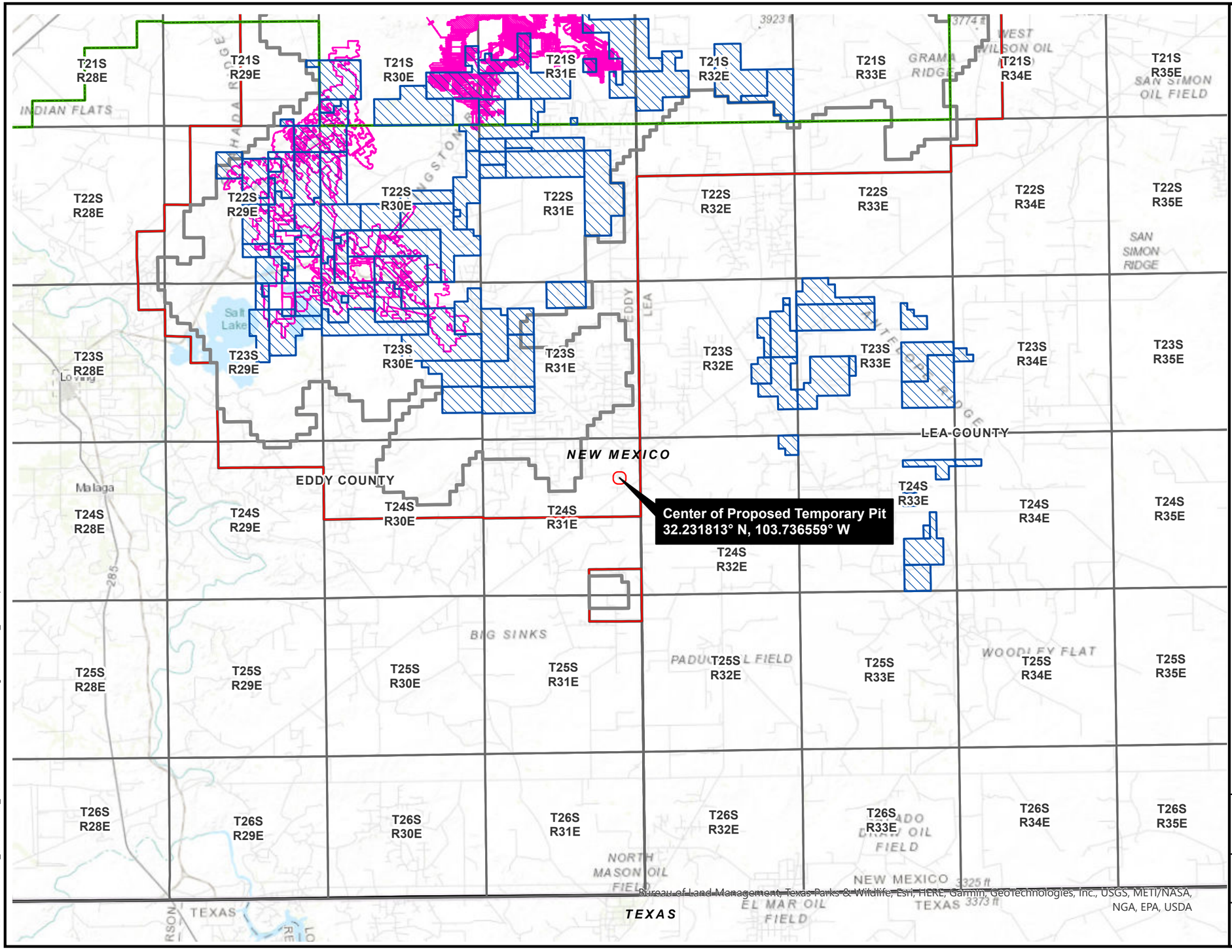
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

# FLOODPLAIN MAP

ARCADIS

FIGURE 3

DIV/GROUP: ENV/MDV DB: avl00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\ProSandDunes\C144 Figures\Javelina_P433H.aprx DATE: 3/16/2022 3:46 PM




## LEGEND

- Mine Workings
- Proposed Temporary Pit
- 1,000 ft Buffer
- Potash Leases
- Four String Casing Area
- Known Potash Leasing Area
- Schedule of Proposed Actions
- Townships

0 20,000 40,000

Feet

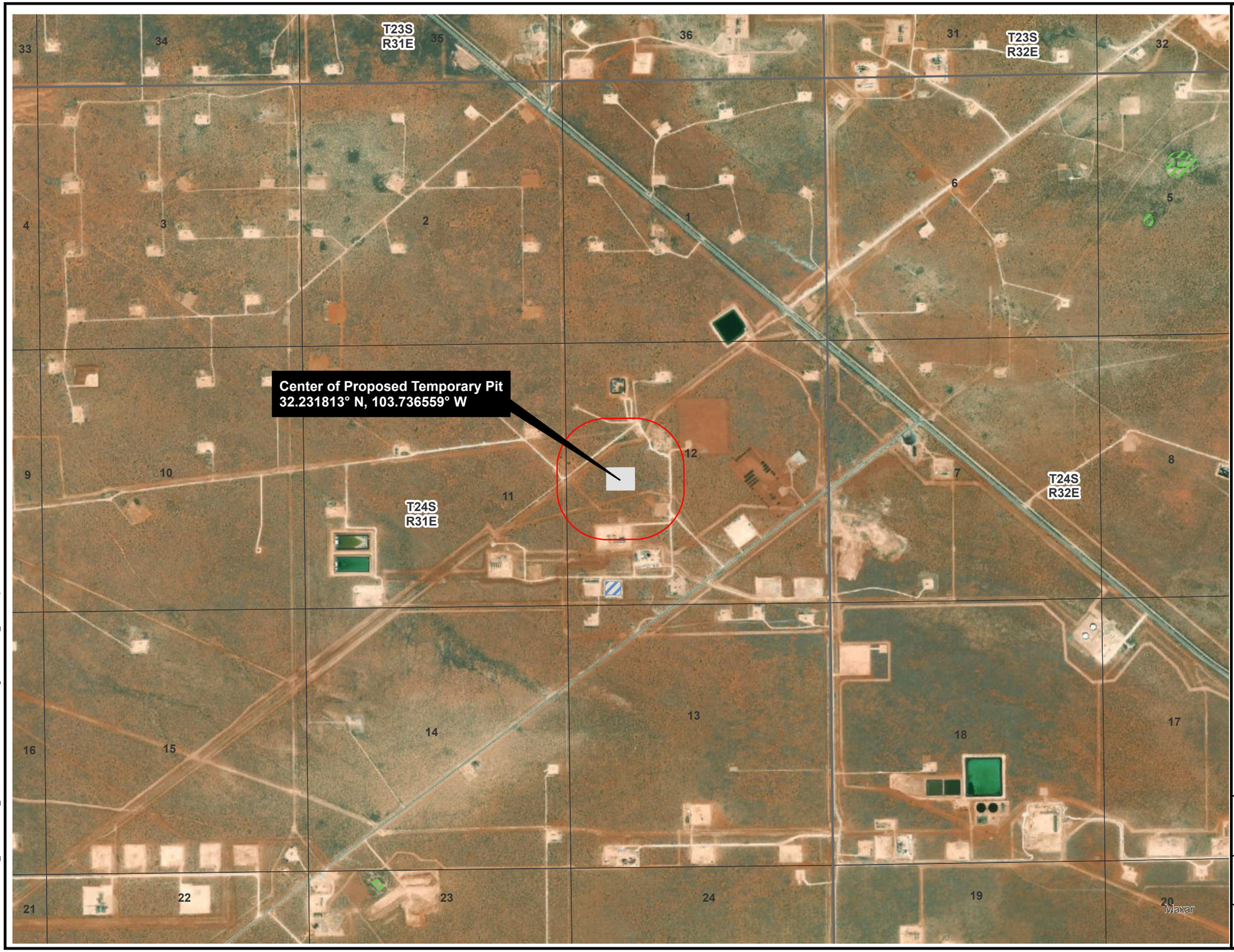
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

**SUBSURFACE MINES - POTASH**

ARCADIS

FIGURE 4

DIV/GROUP: ENV/MDV DR: avl/00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\Pro\SandDunes\C144 Figures\Javelina_P433H.aprx DATE: 3/16/2022 3:46 PM




## LEGEND

- Proposed Temporary Pit
- 1,000 ft Buffer
- Freshwater Emergent Wetland
- Freshwater Pond
- Townships
- Sections

Notes:
1. No Wetlands Data in Map Extent.
2. USFWS - United States Fish and Wildlife Service
3. NWI - National Wetlands Inventory

Data Source: BLM CFO. 2018. USFWS NWI Unsurveyed GIS Data

0 2,000 4,000
Feet

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ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

**WETLANDS MAP**

ARCADIS

FIGURE
**5**

DIV/GROUP: ENV/MDV DB: avl00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\Pro\SandDunes\C144 Figures\Javelina_P433H.aprx DATE: 3/16/2022 3:46 PM


## LEGEND

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

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

Data Source: BLM CFO. 2018. USGS NHD Unsurveyed GIS Data.

0 4,000 8,000
Feet

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EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

**ELEVATION CONTOUR & NHD MAP**

ARCADIS

FIGURE
**6**

DIV/GROUP: ENV/MDV DR: avl00976 LD: PIC: PM: TM:
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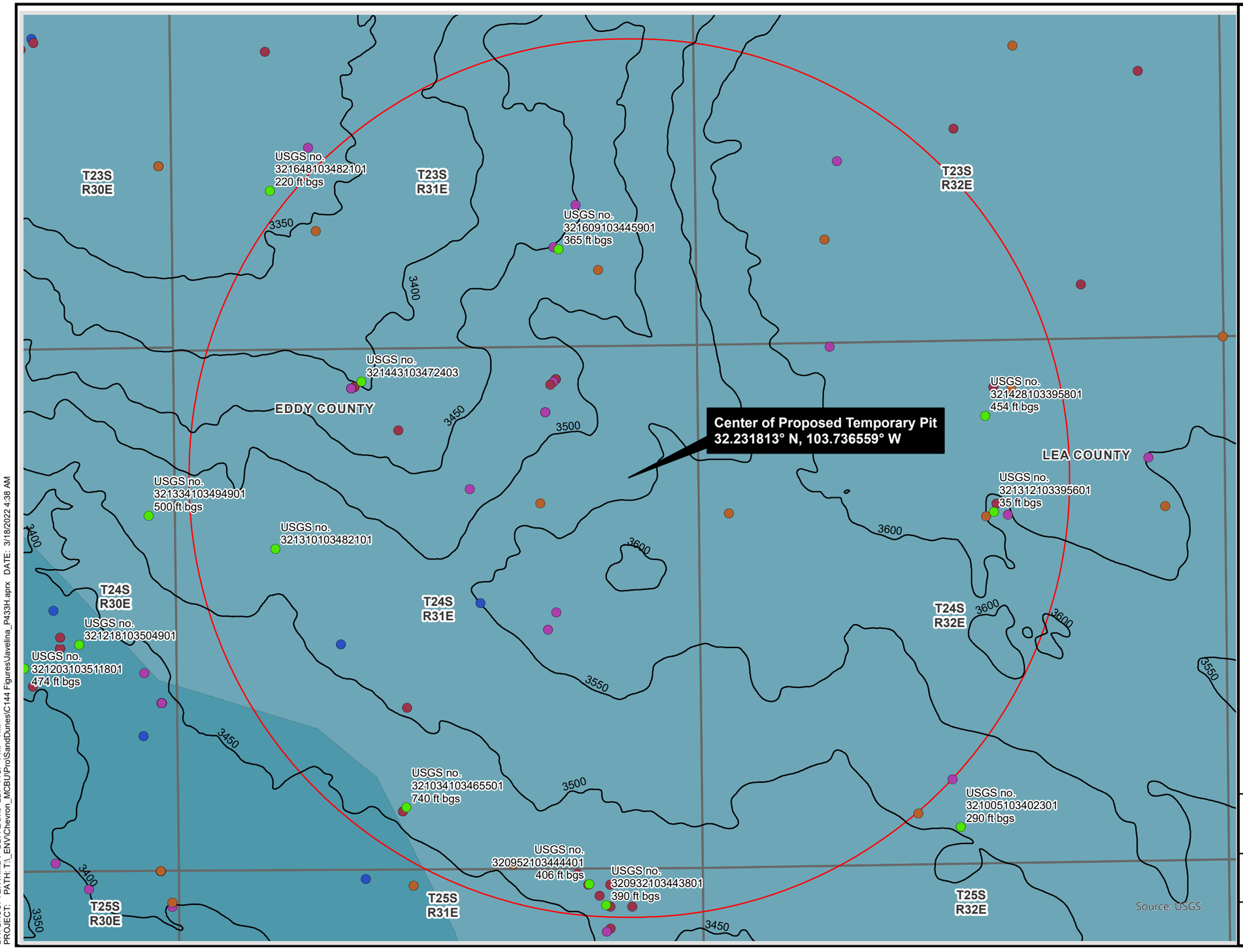


## LEGEND

- 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: BLM CFO. 2018. USGS and NMOSE.

0 6,000 12,000
Feet

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ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

**USGS AND NMOSE GROUNDWATER WELLS**

ARCADIS

FIGURE 7

DIV/GROUP: ENV/MDV DB: ADavis LD: PIC: PM: TM:
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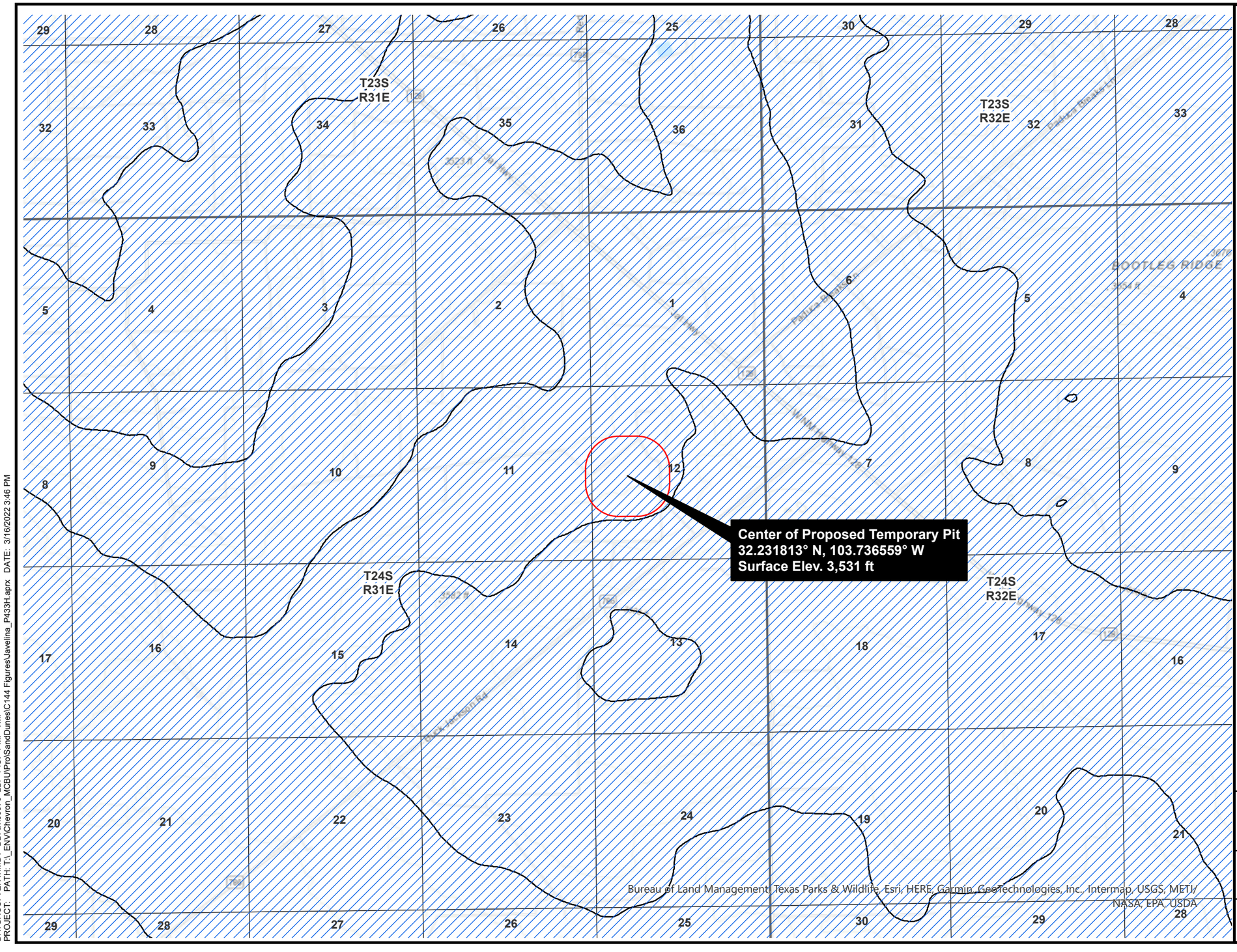


## LEGEND

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

**Karst Occurence Potential**

- Low

0 3,000 6,000

Feet

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ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

# KARST POTENTIAL

ARCADIS

FIGURE 8

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
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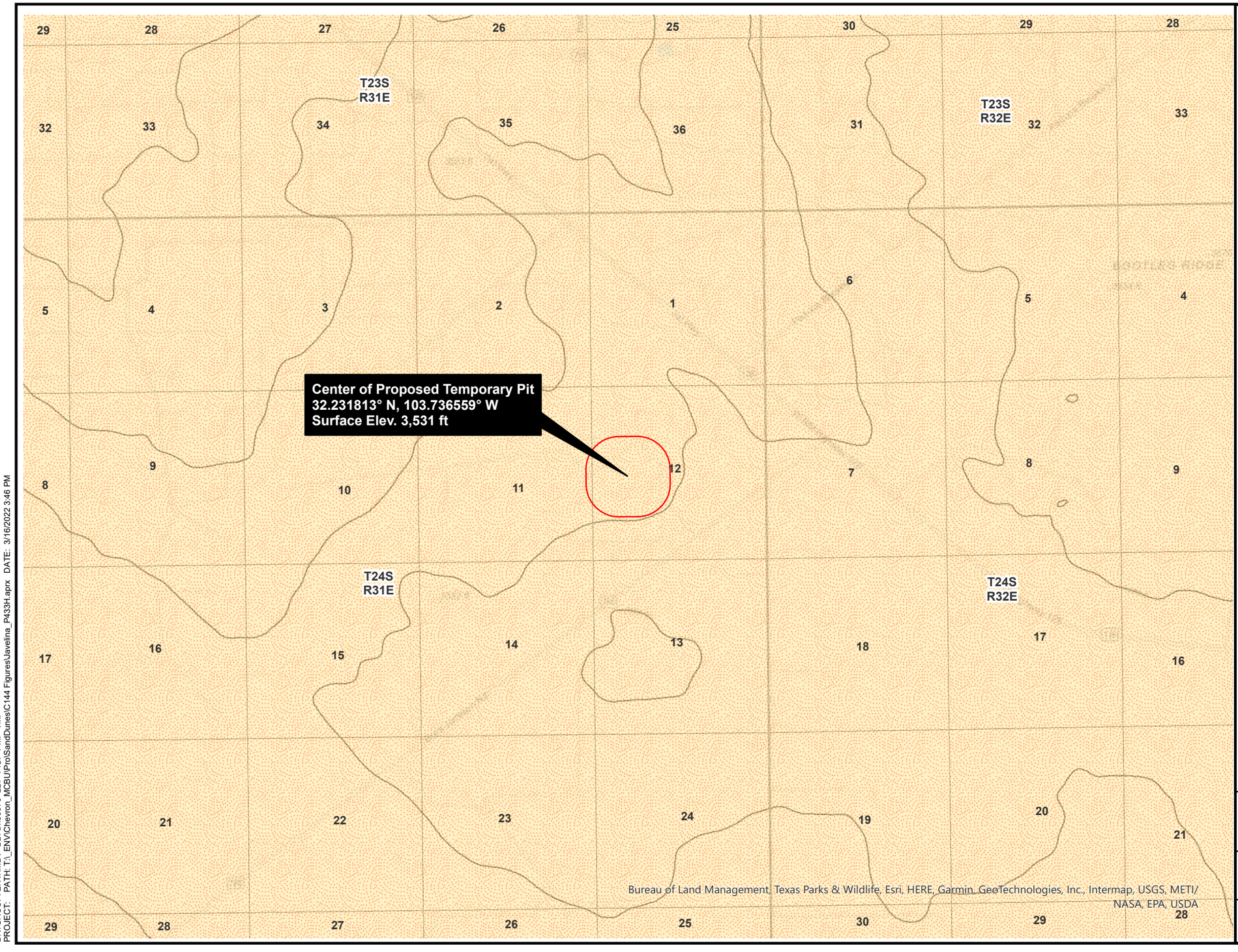


## LEGEND

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

**Aquifer**

**Geology**

- Qe/Qp

Qe: Quaternary Eolian Deposits
Qp: Quaternary Piedmont Deposits

0 3,000 6,000
Feet

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ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

# LOCAL GEOLOGY

ARCADIS

FIGURE 9

DIV/GROUP: ENV/IMDV DB: avl00976 LD: PIC: PM: TM:
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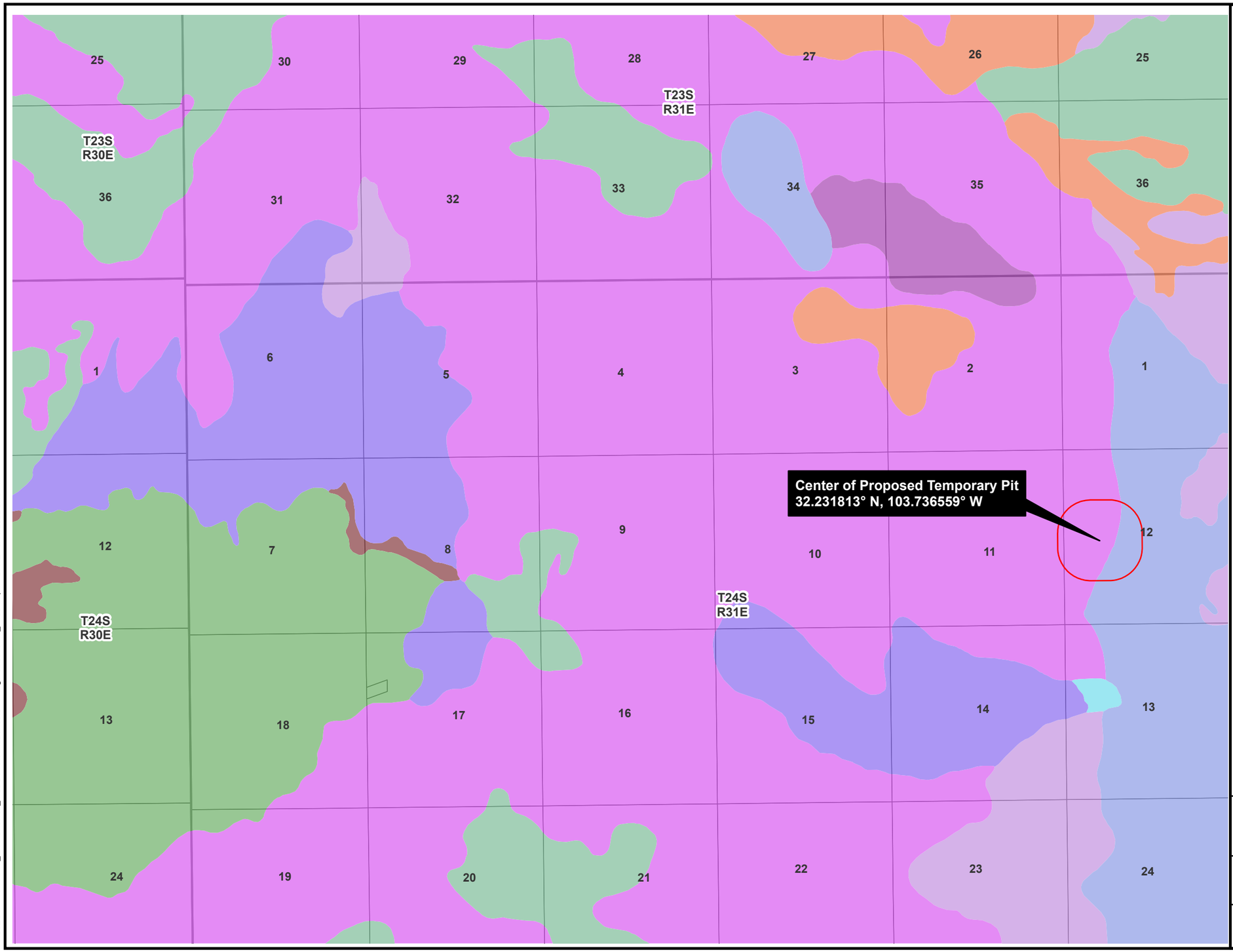



## LEGEND

- 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

0 3,000 6,000

Feet

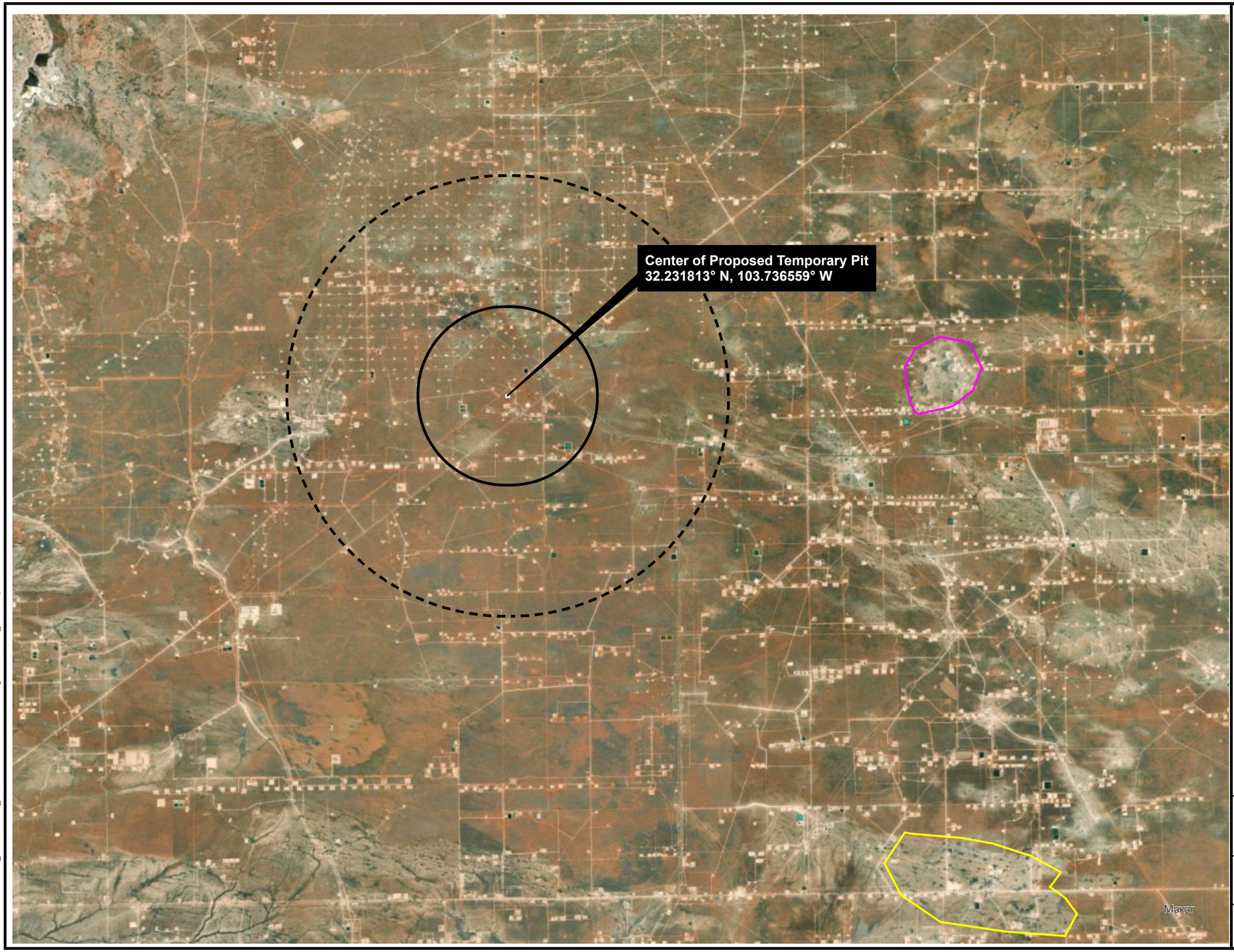
CHEVRON U.S.A. INC.
ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

**SOILS**

ARCADIS

FIGURE
**10**

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\ProjSandDunes\C144 Figures\Javelina_P433H.aprx DATE: 3/16/2022 3:46 PM




## LEGEND

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

0 2 4

Miles

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ENVIRONMENTAL FIELD SURVEYS
EDDY COUNTY, NEW MEXICO
**SAND DUNES JAVELINA UNIT NO. P433H WELL - PROPOSED TEMPORARY RESERVE PIT**

**AERIAL IMAGERY OF DISSOLUTION FEATURES**

ARCADIS

FIGURE 11

DIV/GROUP: ENV/IMDV DB: avi00976 LD: PIC: PM: TM:
PROJECT: PATH: T:_ENV\Chevron_MCBU\ProtSandDunes\C144 Figures\Javelina_P433H.aprx DATE: 3/16/2022 2:56 PM

**Variance Requests**

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, T24S, R31E

**Variance Requests**
**Javelina Unit P433 (433H, 434H, 435H)**
**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

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

SOLMAX

# 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(1) | UNIT Imperial | |
|---|---|---|---|---|
| **SPECIFICATIONS** | | | | |
| 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 |
| **SUPPLY SPECIFICATIONS** (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 responsability 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.

SOLMAX

# 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(1) | UNIT Imperial | |
|---|---|---|---|---|
| **SPECIFICATIONS** | | | | |
| 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 |
| **SUPPLY SPECIFICATIONS** (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-GM13 / 17, latest version.
8. Correlation table is available for ASTM D792 vs ASTM D1505. Both methods give the same results.

## Appendix A

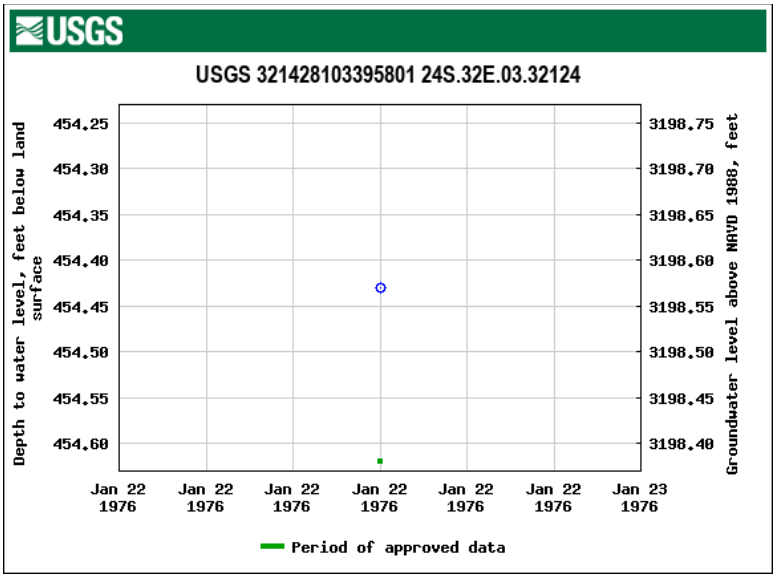
United States Geological Survey

Groundwater Data

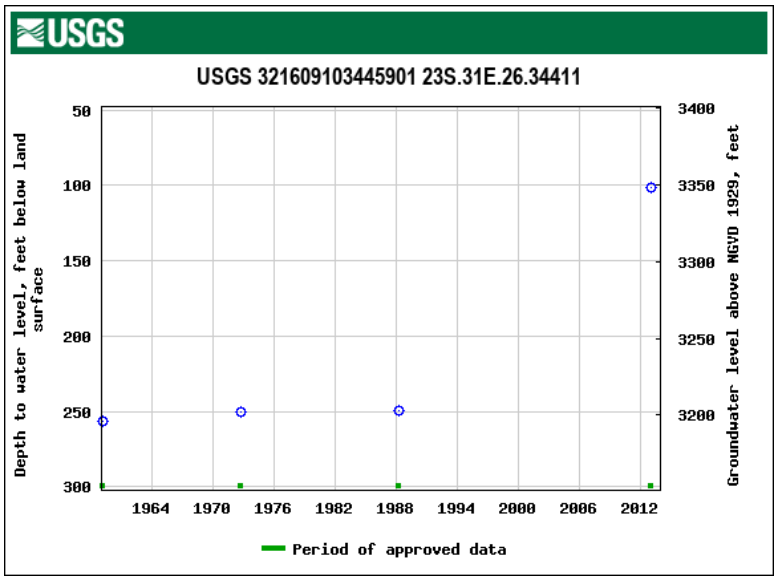
**USGS 321443103472403 24S.31E.04.1341 H-9C**
Latitude 32°14'53", Longitude 103°47'18" NAD27
Eddy County, New Mexico
Hydrologic Unit 13060011
Well depth: not determined.
Land surface altitude: 3,397 feet above NGVD29.
Well completed in "Other aquifers" (N9999OTHER) national aquifer.
Well completed in "Rustler Formation, Unnamed Lower Member" (312RSLRL) local aquifer.

***– No Hydrograph Available –***

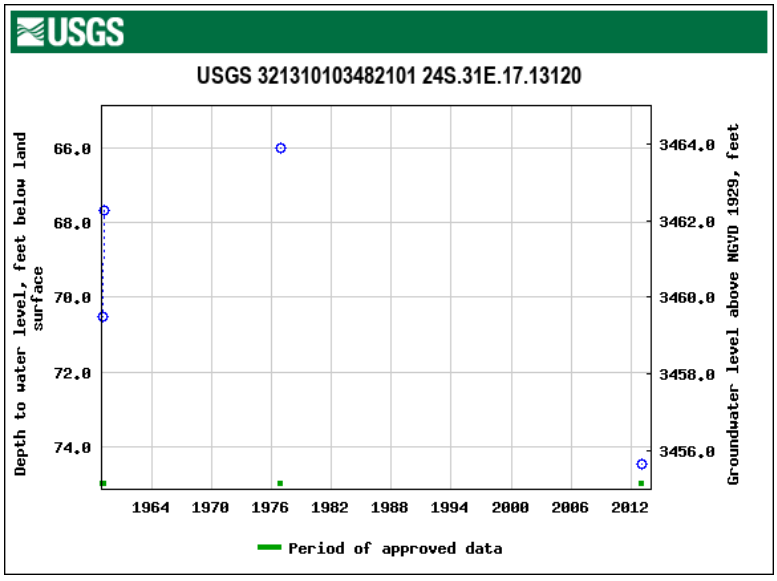
**USGS 321428103395801 24S.32E.03.32124**
Latitude 32°14'28", Longitude 103°39'58" NAD27
Lea County, New Mexico
Hydrologic Unit 13060011
Well depth: 550 feet
Land surface altitude: 3,653 feet above NAVD88.
Well completed in "Other aquifers" (N9999OTHER) national aquifer.
Well completed in "Santa Rosa Sandstone" (231SNRS) local aquifer.



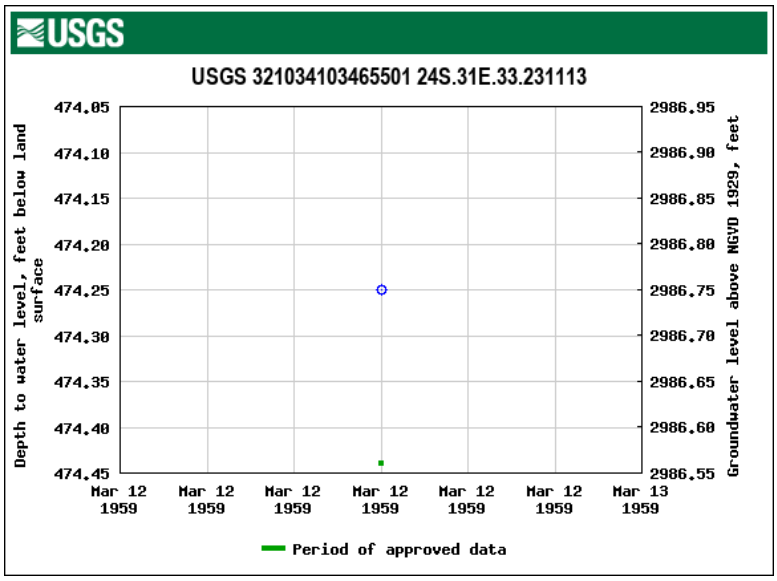
**USGS 321609103445901 23S.31E.26.34411**
Latitude 32°16'11.9", Longitude 103°45'01.2" NAD83
Eddy County, New Mexico
Hydrologic Unit 13060011
Well depth: 365 feet
Land surface altitude: 3,451.00 feet above NGVD29.
Well completed in "Other aquifers" (N9999OTHER) national aquifer.
Well completed in "Dewey Lake Redbeds" (312DYLK) local aquifer.



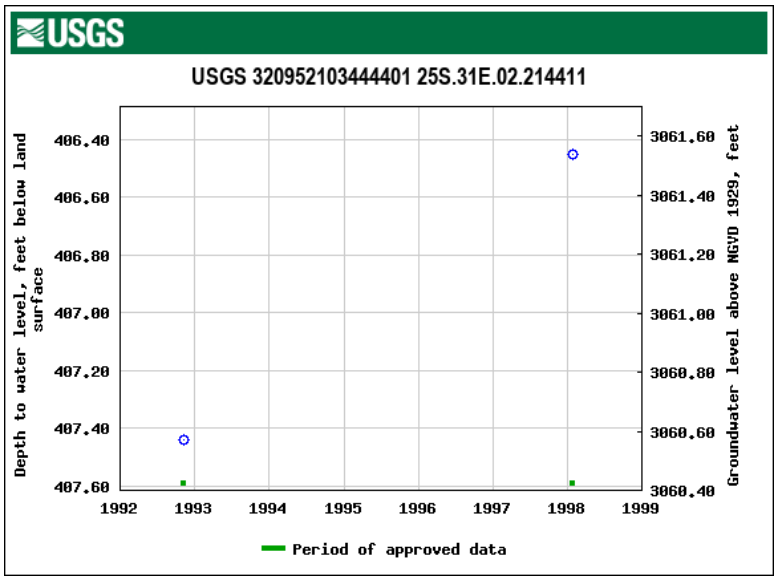

**USGS 321310103482101 24S.31E.17.13120**
Latitude 32°13'14.1", Longitude 103°48'23.4" NAD83
Eddy County, New Mexico
Hydrologic Unit 13060011
Well depth: not determined.
Land surface altitude: 3,530.00 feet above NGVD29.
Well completed in "Other aquifers" (N9999OTHER) national aquifer.
Well completed in "Alluvium, Bolson Deposits and Other Surface Deposits" (110AVMB) local aquifer.



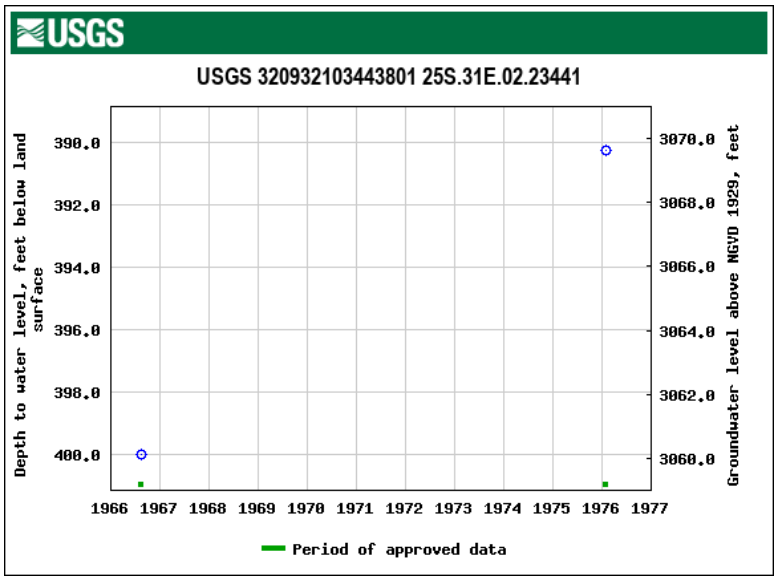
**USGS 321034103465501 24S.31E.33.231113**
Latitude 32°10'38.2", Longitude 103°46'53.0" NAD83
Eddy County, New Mexico
Hydrologic Unit 13070001
Well depth: 740 feet
Land surface altitude: 3,461.00 feet above NGVD29.
Well completed in "Other aquifers" (N9999OTHER) national aquifer.
Well completed in "Rustler Formation" (312RSLR) local aquifer.



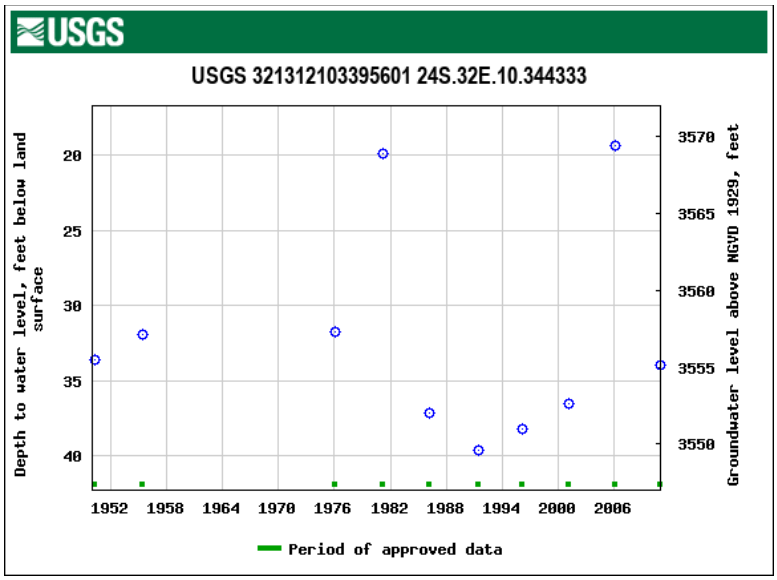
**USGS 320952103444401 25S.31E.02.214411**
Latitude 32°09'50.0", Longitude 103°44'41.2" NAD83
Eddy County, New Mexico
Hydrologic Unit 13070001
Well depth: not determined.
Land surface altitude: 3,468.0 feet above NGVD29.
Well completed in "Other aquifers" (N9999OTHER) national aquifer.
Well completed in "Azotea Tongue of Seven Rivers Formation" (313AZOT) local aquifer.



**USGS 320932103443801 25S.31E.02.23441**
Latitude 32°09'37.4", Longitude 103°44'29.6" NAD83
Eddy County, New Mexico
Hydrologic Unit 13070001
Well depth: 1016 feet
Land surface altitude: 3,460.00 feet above NGVD29.
Well completed in "Other aquifers" (N9999OTHER) national aquifer.
Well completed in "Rustler Formation" (312RSLR) local aquifer.




**USGS 321312103395601 24S.32E.10.344333**
Latitude 32°13'30.4", Longitude 103°39'52.7" NAD83
Lea County, New Mexico
Hydrologic Unit 13070007
Well depth: 60 feet
Land surface altitude: 3,589.00 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
USGS 321312103395601 24S.32E.10.344333
Depth to water level, feet below land surface
20
25
30
35
40
Groundwater level above NGVD 1929, feet
3570
3565
3560
3555
3550
1952
1958
1964
1970
1976
1982
1988
1994
2000
2006
Period of approved data

## 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-basin | County | Q 64 | Q 16 | Q 4 | Sec | Tws | Rng | X | Y | Distance | Depth Well | Depth Water | Water Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C 02460 | C | ED | | | 3 | 02 | 24S | 31E | 617496 | 3568022* | 1922 | 320 | | |
| C 02460 POD2 | C | ED | | | 3 | 02 | 24S | 31E | 617496 | 3568022* | 1922 | 320 | | |
| C 03530 POD1 | C | LE | 3 | 4 | 3 | 07 | 24S | 32E | 620886 | 3566156 | 1961 | 550 | | |
| C 02464 | C | ED | 2 | 3 | 1 | 02 | 24S | 31E | 617645 | 3568581 | 2179 | 320 | 205 | 115 |
| C 02405 | CUB | ED | | 4 | 1 | 02 | 24S | 31E | 617690 | 3568631* | 2187 | 275 | 160 | 115 |
| C 04576 POD1 | CUB | ED | 1 | 2 | 1 | 23 | 24S | 31E | 617700 | 3564324 | 2977 | 910 | 850 | 60 |
| C 02440 | C | ED | | 2 | 3 | 10 | 24S | 31E | 616103 | 3566599* | 3013 | 350 | | |
| C 04388 POD1 | C | ED | 3 | 2 | 1 | 23 | 24S | 31E | 617546 | 3564006 | 3330 | 910 | 868 | 42 |
| C 04508 POD1 | CUB | ED | 4 | 4 | 3 | 15 | 24S | 31E | 616298 | 3564493 | 3726 | 110 | | |
| C 03555 POD1 | C | LE | 2 | 2 | 1 | 05 | 24S | 32E | 622748 | 3569233 | 4305 | 600 | 380 | 220 |
| C 02348 | C | ED | 1 | 4 | 3 | 26 | 23S | 31E | 617648 | 3571068 | 4360 | 700 | 430 | 270 |
| C 02258 | C | ED | | 3 | 2 | 26 | 23S | 31E | 618055 | 3571853* | 5007 | 662 | | |
| C 02661 | CUB | ED | 3 | 3 | 1 | 04 | 24S | 31E | 613969 | 3568485* | 5349 | 708 | | |
| C 02785 | CUB | ED | 3 | 3 | 1 | 04 | 24S | 31E | 613969 | 3568485* | 5349 | 692 | | |
| C 02783 | CUB | ED | 3 | 3 | 1 | 04 | 24S | 31E | 613911 | 3568461 | 5398 | 708 | | |
| C 02783 POD2 | CUB | ED | 3 | 3 | 1 | 04 | 24S | 31E | 613911 | 3568461 | 5398 | 672 | | |
| C 02784 | C | ED | 4 | 2 | 4 | 04 | 24S | 31E | 613911 | 3568461 | 5398 | 584 | | |
| C 03529 POD1 | C | LE | 2 | 4 | 3 | 29 | 23S | 32E | 622651 | 3571212 | 5547 | 550 | | |
| C 04499 POD1 | CUB | ED | 3 | 4 | 2 | 20 | 24S | 31E | 613719 | 3563732 | 6268 | 111 | | |
| C 02350 | CUB | ED | | 4 | 3 | 10 | 24S | 32E | 625826 | 3566333* | 6759 | 60 | | |
| C 03851 POD1 | CUB | LE | 3 | 3 | 4 | 20 | 23S | 32E | 622880 | 3572660 | 6845 | 1392 | 713 | 679 |
| C 03527 POD1 | C | LE | 1 | 2 | 3 | 03 | 24S | 32E | 625770 | 3568487 | 6848 | 500 | | |
| C 03528 POD1 | C | LE | 1 | 1 | 2 | 15 | 24S | 32E | 626040 | 3566129 | 6994 | 541 | | |
| C 02574 | CUB | ED | 1 | 1 | 2 | 02 | 25S | 31E | 618092 | 3559494* | 7528 | | | |
| C 02572 | CUB | ED | 4 | 2 | 2 | 02 | 25S | 31E | 618695 | 3559294* | 7671 | 852 | | |
| C 02571 | CUB | ED | 4 | 1 | 2 | 02 | 25S | 31E | 618292 | 3559294* | 7703 | 860 | | |

***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-basin Code | County | Q 64 | Q 16 | Q 4 | Sec | Tws | Rng | X | Y | Distance | Depth Well | Depth Water | Water Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C 02573 | CUB | ED | 1 | 4 | 2 | 02 | 25S | 31E | 618499 | 3559091* | 7886 | | | |

Average Depth to Water: **515 feet**

Minimum Depth: **160 feet**

Maximum Depth: **868 feet**

**Record Count:** 27

**UTMNAD83 Radius Search (in meters):**

**Easting (X):** 619095.23 **Northing (Y):** 3566955 **Radius:** 8045

***UTM location was derived from PLSS - see Help**

**Appendix C – Hydrogeologic Data**

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, T24S, R31E

**Appendix C – Hydrogeologic Data**
**Sand Dunes 433H**
**Temporary Pit**

## Topography and Surface Hydrology

The location of the proposed temporary pit is in southwestern Lea 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 3,500 ft above sea level and the general area in the vicinity of the pit is characterized by bluffs surrounded by relatively flat to gentle sloping terrain (**Figure 7**). The land surface slopes gently to the southwest at approximately 25 feet per mile.

Surface water within the survey area is affected naturally by geology, precipitation, and water erosion. The area is located in the semi-arid southwest on the northern edge of the Chihuahuan Desert where annual precipitation averages 10.5 inches with the greatest rainfall occurring as monsoonal storms in late summer (July – September). About half of the annual precipitation is received during this period via brief, intense storms that can cause large amounts of runoff and potential flooding (NMOSE 2010).

Southwestern Lea County, including the temporary pit area, lies within the Lower Pecos River Basin. The major stream flowing through this basin is the Pecos River which is located approximately 17 miles to the west of the survey area 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. The Pecos River bisects Eddy County and runs through the center of the City of Carlsbad. The Pecos River is dammed by Brantley Dam and by Avalon Dam 10-miles northwest and 5-miles north of Carlsbad, respectively, and by Red Bluff Dam located just across the New Mexico – Texas State line.

There are no streams or other tributaries to the Pecos River in the vicinity of the proposed location for the temporary pit. Anthropogenic activities that could affect surface water resources in the area include livestock grazing management and oil and gas development. Surface water flow direction for various parts of the area depends on the slope of the land which is generally to the southwest. Surface drainage flows ephemerally during precipitation events and collects in depressions, infiltrates soil, or evaporates. At its closest point, the Pecos River is located approximately 17 miles west of the survey area.

## Soils

The majority of the soil complexes mapped within the survey area are the Berino Complex (BB) and Tonuco Loamy Fine Sand (TF) and are 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 |
| TF- Tonuco Loamy Fine Sand | 0 to 3 percent slope | Deep |

## Loamy Sand Soil Type Description

The majority of the soils within the survey area are classified as loamy sand soils. These loamy sand soils consist of the Berino. Pajarito and Tonuco soil series with additional minor soil types. 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 / Ogallala thickness in this area appears to be approximately 100 to 200 feet. Triassic Dockum strata outcrop along Paduca Breaks to the southeast of the survey area. Triassic Dockum strata underlie the alluvium / Ogallala 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.

- 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.

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 / Ogallala 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**). 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/Ogallala, some in the Dockup and one may be 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 100 feet based on the closest wells which are 4,500 feet or more from the proposed site. The depths to water within a 5-mile radius of the proposed site range from 20 feet (approximately 4 miles north of the proposed site) to 474 feet in a Rustler Formation well located approximately 4.4 miles from 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 Ogallala aquifer. This part of Lea County appears to be situated at or near the northern edge of the Pecos River Basin Alluvium aquifer. In this area, the Alluvium/Ogallala appears to be 200 feet in thickness or less and contains water based on data from the USGS and NMOSE database. 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 from 5 gallons per minute (gpm) to 18 gpm for the shallow wells (300 feet or less in depth) and 35 gpm to 58 gpm for the deeper wells (646 feet and 750 feet in depth). The Permian rocks which underlie the Triassic Dockum formations do not typically contain potable water.

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 Lea Co., NM is between 0 and 0.5 inches/year (Hutchison et al., 2011).

**References**

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Nicholson, Alexander, Jr. and Clebsch, Alfred, Jr. 1961. Ground-Water Report 6 – Geology and Ground-Water Conditions in Southern Lea County, New Mexico. United States Geological Survey in cooperation with the New Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Division and the New Mexico State Engineer.

U.S. Department of Agriculture (USDA). 2013. Natural Resources Conservation Service. Soil Surveys by State available at www.nrcs.usda.gov.

USDA. 2016. Sandy Ecological Site Characteristics. [Web page]. Located at https://esis.sc.egov.usda.gov/ESDReport/fsReport.aspx?approved=yes&repType=regular&id=R042XA051NM. Accessed: March 2022.

**Appendix D – Design Plan**

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, T24S, R31E

**Appendix D – Design Plan**

**Javelina Unit P433 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 atthe 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 isin 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 LinearLow-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.

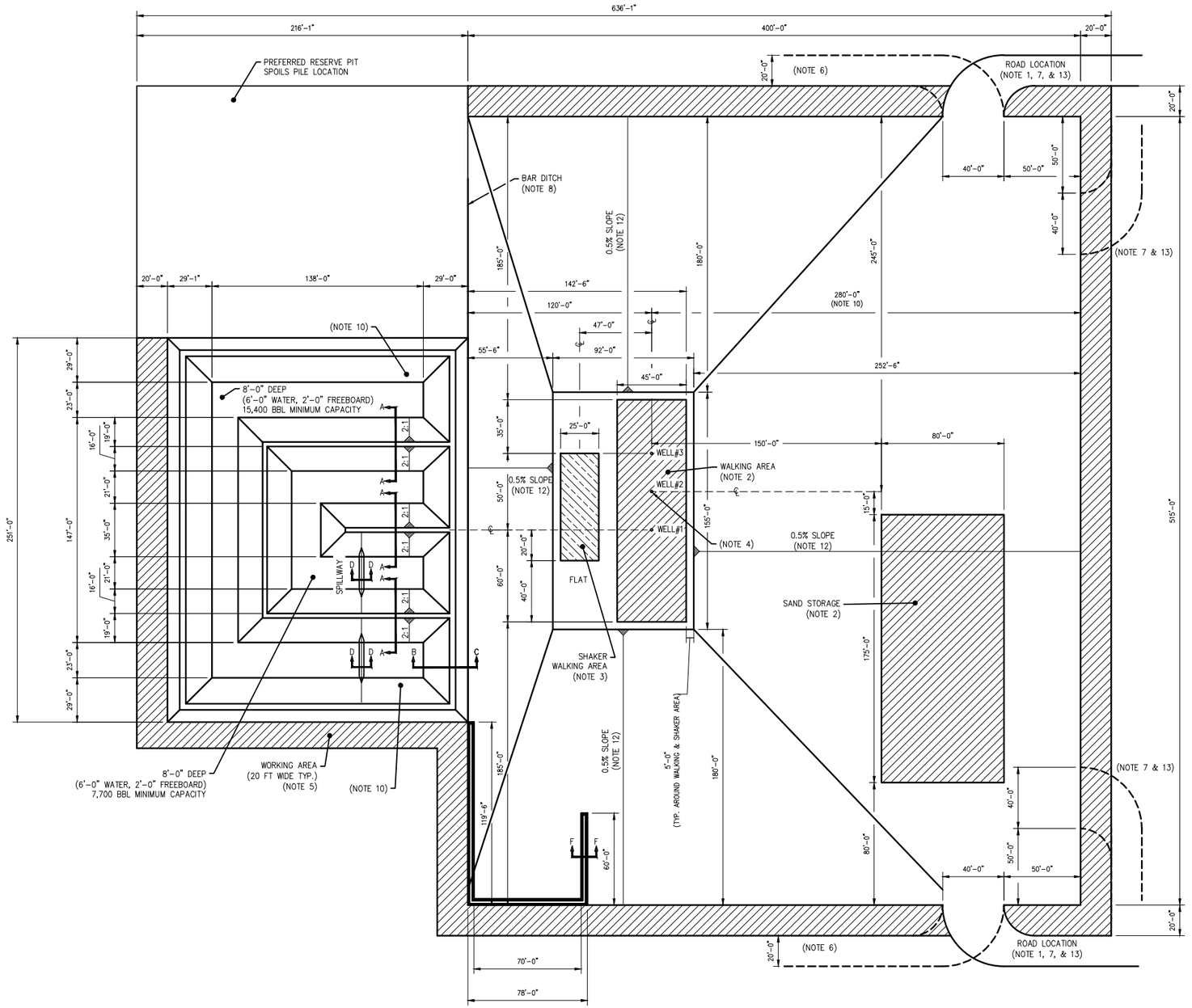
- The edged of the liner will be anchored in the bottom of a compacted earth field trench that is 18 inches deep.

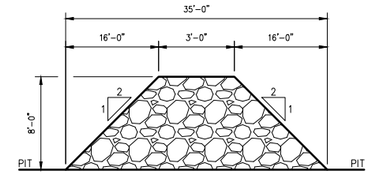
- Impingement of liquids onto the liner will be prevented by use of a loose hose discharge method. The design ensures fluid enters a malleable section of hose laying on the pit berm prior to entering the pit preventing direct impingement.

- 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.

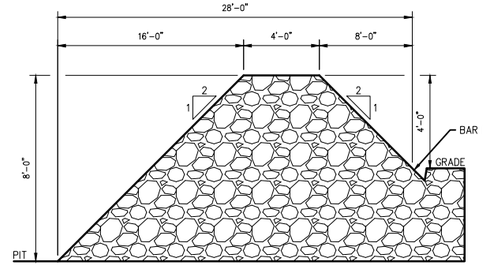
- The volume of the temporary pit is 6.6 acre-ft including freeboard.

- 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.

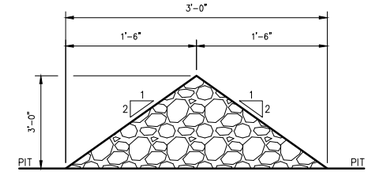


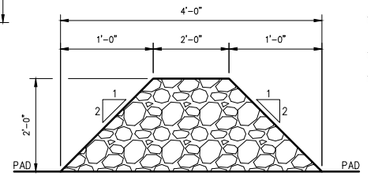

SECTION A–A
NOT TO SCALE




SECTION B–C
NOT TO SCALE




SECTION D–D
NOT TO SCALE




SECTION F–F
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.
6. ROAD CAN COME FROM EITHER THE NORTH OR SOUTH DIRECTION DEPENDING ON LEASE ORIENTATION.
7. SECONDARY ACCESS ROAD IS REQUIRED FOR COMPLETIONS 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.
8. 1FT. X 1FT. BAR DITCHING TO BE PROVIDED BETWEEN PAD AND RESERVE PIT, DITCH WILL BE FILLED WITH 1" CLEAN ROCK.
9. 6 LOADS OF ROCK FOR DRILLING TRAILERS & DITCH COM ROCK DROPPED IN NEW CORNER.
10. DIMENSION SOUTH OF THE WELLS CAN BE REDUCED TO 260' IF BASIS OF DESIGN IS CONVENTIONAL FRAC OPERATIONS.
11. PAINT 8' LONG PIT LEVEL MARKERS EVERY 2' FROM THE BOTTOM LABEL BY THE LENGTH OF THE INCLINE FROM THE BOTTOM OF THE PIT.
12. PREDOMINANT DRAINING DIRECTION TO BE FIELD–DETERMINED BASED ON LOCAL TOPOGRAPHY.
13. 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.)

80' 40' 0' 20' 40' 60' 80'

SCALE: 1"=40'

SHEET CIV006

REVISIONS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 0 | APPROVED FOR CONSTRUCTION BASIN DESIGN, DRF 21103 CSD 04/05/21 | EV | CKHT | | | | | |
| 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 3 WELL PAD PLAN – OPEN LOOP

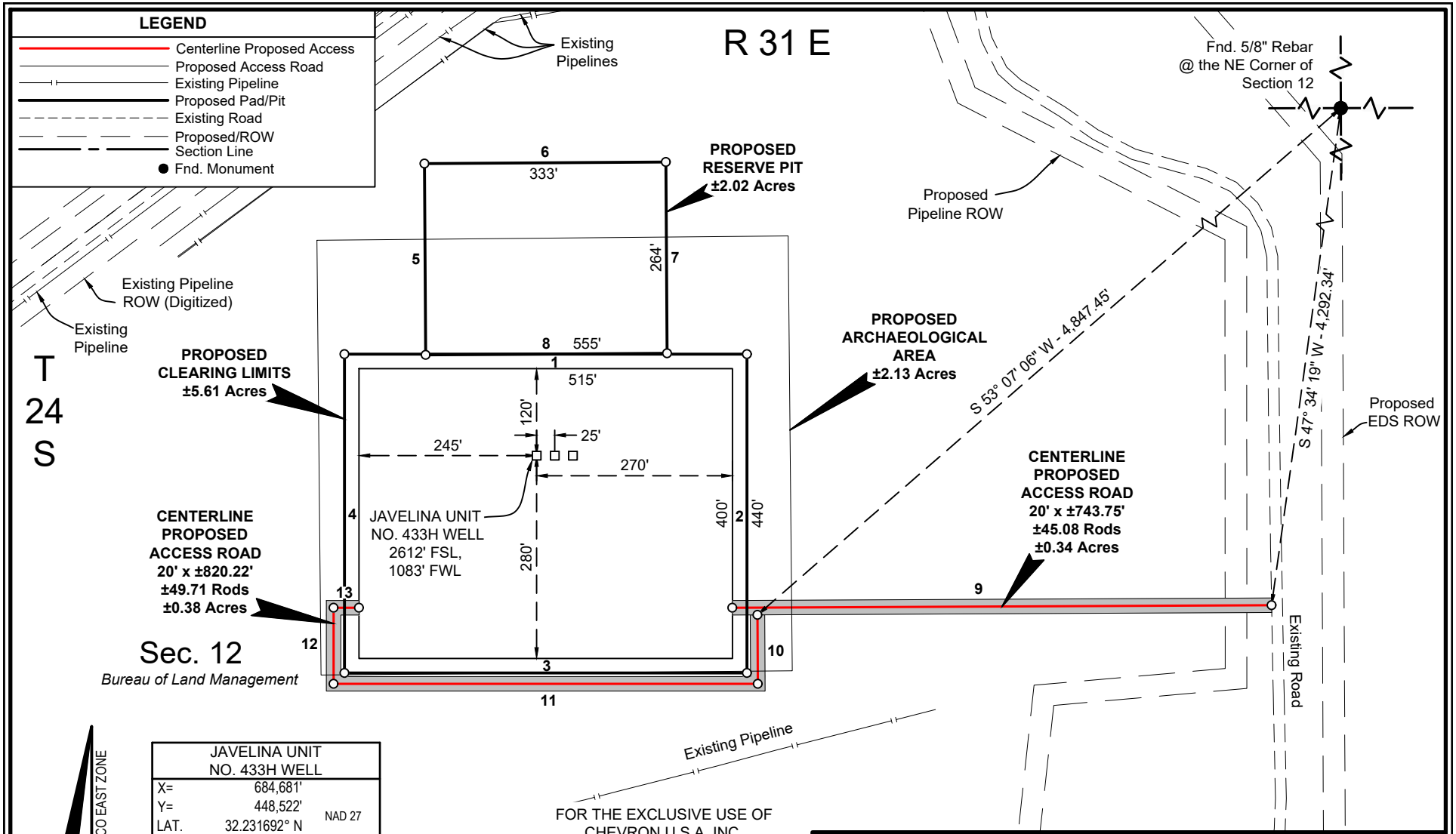
DR. JLH
ENG. KVPY

FACTSTD-3WPADOPN-CIV-PVD-MCB-0001-01

1

ALTERNATE DWG NUMBER API NUMBER LEASE NUMBER *

PLOT DATE: 08/31/2021, FILE NAME: 2020-PADSWELLS-MECH-CIV-PVD-MCB-0002-06




| JAVELINA UNIT NO. 433H WELL | | |
|---|---|---|
| X= | 684,681' | NAD 27 |
| Y= | 448,522' | |
| LAT. | 32.231692° N | |
| LONG. | 103.736077° W | |
| X= | 725,864' | NAD83/2011 |
| Y= | 448,581' | |
| LAT. | 32.231815° N | |
| LONG. | 103.736561° W | |
| ELEV. | +3,531' | NAVD88 |

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 NEW MEXICO 23006 PROFESSIONAL SURVEYOR 08/13/2021

Robert L. Lastrapes
Registration No. 23006

WELL PLAT Page 1 of 2

# CHEVRON U.S.A. INC.

PROPOSED PAD, RESERVE PIT AND ACCESS ROADS
JAVELINA UNIT NO. 433H WELL
SECTION 12, T24S-R31E
EDDY COUNTY, NEW MEXICO

| | REVISIONS | | | |
|---|---|---|---|---|
| DRAWN BY: AMR | # | BY: | DATE: | DESCRIPTION: |
| PROJ. MGR.: VHV | | | | |
| DATE: 08/02/2021 | | | | |
| FILENAME: T:\2021\2213505\DWG\Javelina Unit No. 433H Well Plat.dwg | | | | |

FENSTERMAKER
C. H. Fenstermaker & Associates, L.L.C.
135 Regency Sq. Lafayette, LA 70508
Ph. 337-237-2200 Fax. 337-232-3299
www.fenstermaker.com

| NW CLEARING LIMITS CORNER | | | NE CLEARING LIMITS CORNER | | | NW ARCH AREA CORNER | | | NE ARCH AREA CORNER | | | NW RESERVE PIT CORNER | | | NE RESERVE PIT CORNER | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X= | 684,416' | NAD 27 | X= | 684,971' | NAD 27 | X= | 684,378' | NAD 27 | X= | 685,027' | NAD 27 | X= | 684,526' | NAD 27 | X= | 684,859' | NAD 27 |
| Y= | 448,662' | | Y= | 448,662' | | Y= | 448,819' | | Y= | 448,825' | | Y= | 448,925' | | Y= | 448,927' | |
| LAT. | 32.232081° N | | LAT. | 32.232073° N | | LAT. | 32.232514° N | | LAT. | 32.232520° N | | LAT. | 32.232802° N | | LAT. | 32.232803° N | |
| LONG. | 103.736932° W | | LONG. | 103.735137° W | | LONG. | 103.737052° W | | LONG. | 103.734950° W | | LONG. | 103.736570° W | | LONG. | 103.735494° W | |
| X= | 725,600' | NAD83/2011 | X= | 726,155' | NAD83/2011 | X= | 725,562' | NAD83/2011 | X= | 726,211' | NAD83/2011 | X= | 725,710' | NAD83/2011 | X= | 726,043' | NAD83/2011 |
| Y= | 448,721' | | Y= | 448,721' | | Y= | 448,878' | | Y= | 448,884' | | Y= | 448,984' | | Y= | 448,986' | |
| LAT. | 32.232205° N | | LAT. | 32.232196° N | | LAT. | 32.232637° N | | LAT. | 32.232644° N | | LAT. | 32.232926° N | | LAT. | 32.232927° N | |
| LONG. | 103.737414° W | | LONG. | 103.735620° W | | LONG. | 103.737535° W | | LONG. | 103.735433° W | | LONG. | 103.737053° W | | LONG. | 103.735976° W | |
| ELEV. | +3,528' | NAVD88 | ELEV. | +3,530' | NAVD88 | ELEV. | +3,527' | NAVD88 | ELEV. | +3,529' | NAVD88 | ELEV. | +3,529' | NAVD88 | ELEV. | +3,528' | NAVD88 |
| SW CLEARING LIMITS CORNER | | | SE CLEARING LIMITS CORNER | | | SW ARCH AREA CORNER | | | SE ARCH AREA CORNER | | | SW RESERVE PIT CORNER | | | SE RESERVE PIT CORNER | | |
| X= | 684,416' | NAD 27 | X= | 684,971' | NAD 27 | X= | 684,383' | NAD 27 | X= | 685,033' | NAD 27 | X= | 684,528' | NAD 27 | X= | 684,861' | NAD 27 |
| Y= | 448,222' | | Y= | 448,222' | | Y= | 448,219' | | Y= | 448,225' | | Y= | 448,661' | | Y= | 448,663' | |
| LAT. | 32.230872° N | | LAT. | 32.230863° N | | LAT. | 32.230864° N | | LAT. | 32.230871° N | | LAT. | 32.232077° N | | LAT. | 32.232078° N | |
| LONG. | 103.736940° W | | LONG. | 103.735145° W | | LONG. | 103.737045° W | | LONG. | 103.734942° W | | LONG. | 103.736570° W | | LONG. | 103.735493° W | |
| X= | 725,600' | NAD83/2011 | X= | 726,155' | NAD83/2011 | X= | 725,567' | NAD83/2011 | X= | 726,217' | NAD83/2011 | X= | 725,712' | NAD83/2011 | X= | 726,045' | NAD83/2011 |
| Y= | 448,281' | | Y= | 448,281' | | Y= | 448,278' | | Y= | 448,284' | | Y= | 448,720' | | Y= | 448,722' | |
| LAT. | 32.230995° N | | LAT. | 32.230987° N | | LAT. | 32.230988° N | | LAT. | 32.230994° N | | LAT. | 32.232200° N | | LAT. | 32.232201° N | |
| LONG. | 103.737422° W | | LONG. | 103.735627° W | | LONG. | 103.737527° W | | LONG. | 103.735425° W | | LONG. | 103.737052° W | | LONG. | 103.735975° W | |
| ELEV. | +3,534' | NAVD88 | ELEV. | +3,536' | NAVD88 | ELEV. | +3,533' | NAVD88 | ELEV. | +3,536' | NAVD88 | ELEV. | +3,529' | NAVD88 | ELEV. | +3,530' | NAVD88 |

| CENTERLINE PROPOSED ACCESS ROAD | | |
|---|---|---|
| COURSE | BEARING | DISTANCE |
| 9 | S 89° 43' 39" W | 743.75' |

| CENTERLINE PROPOSED ACCESS ROAD | | |
|---|---|---|
| COURSE | BEARING | DISTANCE |
| 10 | S 00° 16' 21" E | 95.17' |
| 11 | WEST | 585.05' |
| 12 | NORTH | 105.00' |
| 13 | EAST | 35.00' |

| PROPOSED DRILL PAD | | |
|---|---|---|
| COURSE | BEARING | DISTANCE |
| 1 | EAST | 555.00' |
| 2 | SOUTH | 440.00' |
| 3 | WEST | 555.00' |
| 4 | NORTH | 440.00' |

| PROPOSED RESERVE PIT | | |
|---|---|---|
| COURSE | BEARING | DISTANCE |
| 5 | N 00° 22' 31" W | 264.00' |
| 6 | N 89° 37' 29" E | 333.00' |
| 7 | S 00° 22' 31" E | 264.00' |
| 8 | S 89° 37' 29" W | 333.00' |

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

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.

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
NEW MEXICO
23006
PROFESSIONAL SURVEYOR
08/13/2021

Robert L. Lastrapes
Registration No. 23006

FENSTERMAKER
C. H. Fenstermaker & Associates, L.L.C.
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www.fenstermaker.com

WELL PLAT Page 2 of 2

# CHEVRON U.S.A. INC.

PROPOSED PAD, RESERVE PIT AND ACCESS ROADS
JAVELINA UNIT NO. 433H WELL
SECTION 12, T24S-R31E
EDDY COUNTY, NEW MEXICO

| | REVISIONS | | | |
|---|---|---|---|---|
| DRAWN BY: AMR | # | BY: | DATE: | DESCRIPTION: |
| PROJ. MGR.: VHV | | | | |
| DATE: 08/02/2021 | | | | |
| FILENAME: T:\2021\2213505\DWG\Javelina Unit No. 433H Well Plat.dwg | | | | |

**Appendix E – Operating and Maintenance Plan**

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, T24S, R31E

**Appendix E – Operating and Maintenance Plan**
**Javelina Unit P433 (433H, 434H, 435H)**
**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 P433 Pit

Section 12, T24S, R31E

**Appendix F – Closure Plan**
**Javelina Unit P433 (433H, 434H, 435H)**
**Temporary Pit**

## Discussion of Onsite Cuttings Disposal

The proposed Temporary Pit will contain drill cuttings from the vertical sections of wells 433H, 434H, and 435H. 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.)<br>M-29-21S-38E<br>Permit No. NM-01-003 | R360 Permian Basin, LLC<br>4507 W. Carlsbad Hwy, Hobbs, NM 88240<br>Permit No. NM-01-0006 |

**Appendix G – Evaluation of Unstable Conditions**

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, T24S, R31E

**Appendix G – Evaluation of Unstable Conditions**
**Sand Dunes 433H**
**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 western end of the Delaware Basin, and is situated north of the Gypsum Plain (Hill 1996). Bedrock cropping out beneath the proposed project area is comprised of the Rustler Formation, a roughly 50-meter-thick sequence of limestone, siltstone, and sandstone with interbedded clay and gypsum (Land and Veni 2014). The Rustler Formation is underlain by the Castile Formation, which is composed chiefly of anhydrite and is more prone to karst formation than the Rustler Formation. The Castile and Rustler formations are highly soluble and karst development in them (i.e., sinkholes and associated caves) is well recognized, particularly in the Gypsum Plain. Stafford et al. (2008) prepared a karst potential map for the Castile Formation outcrop that shows the two densest regions of karst development occur west of the proposed Temporary Pit; however, the proposed Temporary Pit is situated in an area where karst development is expected to be less intense. Karst potential is classified as low potential as shown in Figure 8. There are no indications that voids or other karst features are present or are likely to form in the vicinity of the proposed location. Therefore, 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. TetraTech geotechnical reports and boring logs from <1 mile-away did not indicate karst potential and no groundwater was encountered (**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 25-miles to the southwest (**USGS 2021)**.

**Dissolution Features Evident on Aerial Imagery**

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

- ~12 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 9-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).

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

*Figure G.1: Stratigraphic section beneath the location of the proposed temporary pit (*Nicholson and Clebsch 1961 as cited in Arcadis 2020*)*

**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 (**Figure 8 and Attachment 1**). The on-site survey did not identify any closed depressions, caves, or fissures. The survey determined that the occurrence of voids in the surveyed area was "unlikely" based on a review of the literature, aerial photography, and an assessment of on-site conditions.

**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 calyey 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.

<u>General Construction</u>:

• 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. Cotton Draw Final Environmental Field Survey Report. Prepared for Chevron.

Hill, C.A. 1996. Geology of the Delaware Basin, Guadalupe, Apache and Glass Mountains: New Mexico and West Texas: Permian Basin Section: Midland, Texas, SEPM, 480 pp.

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Nicholson, Alexander, Jr. and Clebsch, Alfred, Jr. 1961. Ground-Water Report 6 - Geology and Ground-Water Conditions in Southern Lea County, New Mexico, United States Geological Survey in cooperation with the New Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Division and the New Mexico State Engineer.

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) 2021. 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 P433 Pit

Section 12, T24S, R31E

Attachment 1
Arcadis Environmental Field Survey, Section 12, Karst Evaluation, Sand Dunes (2018)

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, Section 12, Karst Evaluation, Sand Dunes (2018)

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, T24S, R31E

ARCADIS Design & Consultancy for natural and built assets

Chevron U.S.A. Inc.

# ENVIRONMENTAL FIELD SURVEY

## Sand Dunes Development Area

March 27, 2018

# ENVIRONMENTAL FIELD SURVEY

Sand Dunes Development Area

Khua Moua
Scientist

Adam Davis
Project Scientist

Rachel Cruz
Project Manager

Prepared for:
Kevin Dickerson
Surface Land Representative
Chevron U.S.A. Inc.
6301 Deauville Boulevard
Midland, Texas 79706

Prepared by:
Arcadis U.S., Inc.
630 Plaza Drive
Suite 100
Highlands Ranch
Colorado 80129
Tel 720 344 3500
Fax 720 344 3535

Our Ref.:
B0048820.0000

Date:
March 27, 2018

# 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.

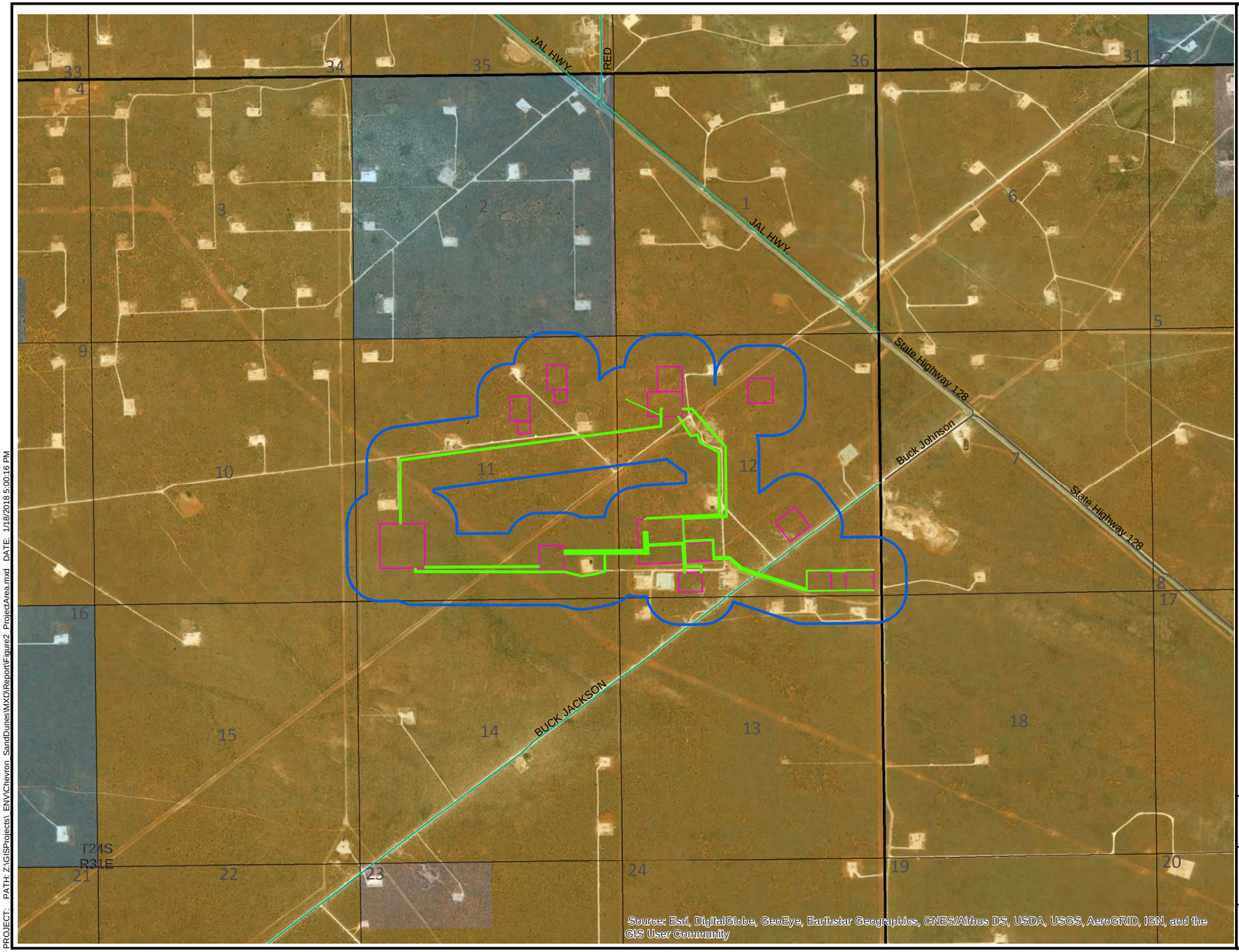
The proposed project area lies near the northeast margin of the Delaware Basin. As discussed in further detail in Section 11.2, bedrock cropping out beneath the proposed project area consists of the Triassic-aged Dockum Group. Underlying the Dockum Group are the Dewey Lake redbeds. Both of these formations 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 11). Multiple areas of small, shallow depressions were identified during the field survey. As noted in the previous section, depressions in the region linked to karst processes (i.e., dissolution of salt at depth in the Salado and Rustler Formations) are very large in size, which is consistent with dissolution of salt at significant depths (approximately 800 feet), where slumping at the surface would be evident. It is our opinion that the depressions observed at the site are too small to be caused by a process of this type. Based on the available information, including the information on geology presented in Section 11.2, the depressions are inferred to be caused by preferential erosion of the loose sandy soils by wind in areas where plant cover is sparse. Areas of unvegetated sand are prone to such erosion.

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## LEGEND

- Survey Area
- Proposed ROW
- Proposed Pad
- Lea County Roads
- Eddy County Roads
- Townships
- Sections

**Surface Ownership**

- Bureau of Land Management
- Private
- State

0 2,000 4,000

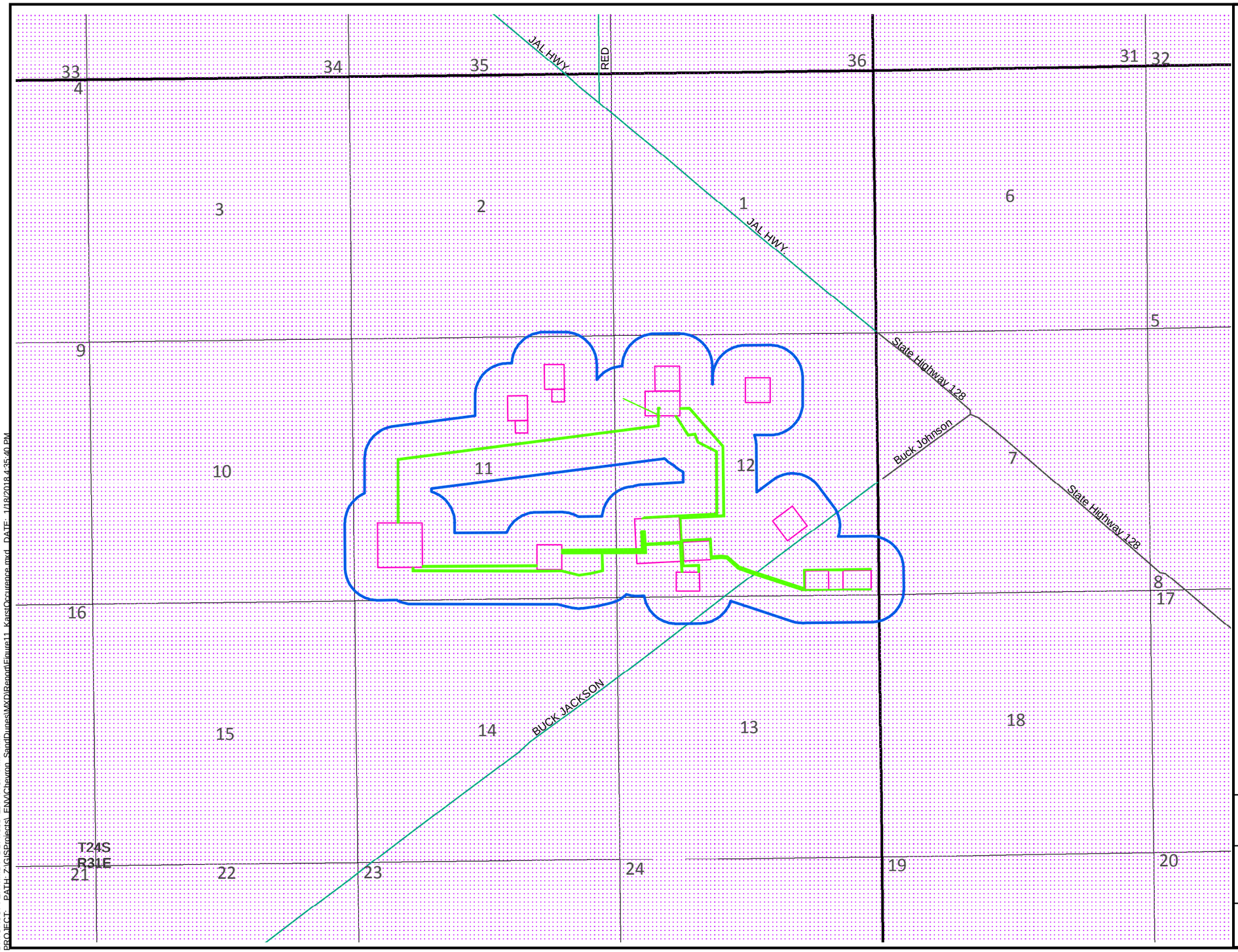
Feet

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

# ENVIROMENTAL FIELD SURVEY AREA

ARCADIS

FIGURE 2

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## LEGEND

- Survey Area
- Proposed ROW
- Proposed Pad
- Lea County Roads
- Eddy County Roads
- Townships
- Sections
- Low Potential Karst

0 2,000 4,000

Feet

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

# KARST POTENTIAL ZONES

ARCADIS

FIGURE
11

# APPENDIX A

## Resumes

PERSONNEL RESUME

# KHUA MOUA

## SCIENTIST 2

**EDUCATION**
BS Wildlife Biology The University of Montana

**YEARS OF EXPERIENCE**
Total – 8 years
With Arcadis – 3 years

**PROFESSIONAL REGISTRATIONS**
None

**PROFESSIONAL ASSOCIATIONS**
None

**CERTIFICATION**
First/Aid/CPR
HAZWOPER 40hr
HAZWOPER 8hr Refresher
MSHA Surface
Safeland
Wetland Delineation Training
Chevron 101
Asbestos Awareness Training
Annual Medical Monitoring

**Ms. Moua** is a field biologist with over three years of experience in environmental field work with Arcadis. She has the following field skills; avian surveys, electrofishing, and radio-telemetry. She has also been exposed to: small mammal trapping, vegetation collocation, paint sampling, soil sampling, archaeological surveys, development of Draft Environmental Impac Statements, construction oversight for windfarm projects, permitting for windfarm projects, report writing, and data entry while with Arcadis. Prior to Arcadis, she has worked for the Bighorn Institute, a non-profit organization focusing their efforts on the Peninsular Bighorn Sheep. In addition, she has also done work with the Peace Corps and the USDA Forest Service. The diversity in her field work encompasses the passion she has for working with the environment.

## Project Experience with Arcadis

### Ironwood & Cimarron II Wind Farm PCMM Surveys
**Duke Energy Power Services, Gray County, Kansas**

Participated in two years of post-construction mortality monitoring, completed Ironwood in late winter 2015 and Cimarron II in early spring 2016. Prepared an annual report to Duke Energy detailing the results of the PCMM surveys. Conducted whooping crane surveys for spring and fall migrations and prepared a report for each season in which surveys were conducted. Reports addressed the diversity of bird migrants that passed through the project area.

### 2014 Swisher Wildlife Surveys
**Exelon Corporation, Swisher, Texas**

Conducted eagle use surveys at the Swisher Wind Farm project site during winter 2014 and prepared a report to Exelon. During spring 2015, conducted raptor nest surveys to document raptor nest presence in and near the project area.

### Fieldwork Supporting Buffalo, Wyoming, Office
**Multiple Clients, Various Locations**

Assisted with SPCC field surveys at three Enbridge Sites in North Dakota. Performed soil sampling at a Citation site in Chinook, Montana, due to a previous year's spill at the location. Performed an archaeological survey

# Project Experience Continued

near Douglas, Wyoming, at a Cameco site. Conducted abandoned mine land surveys at five locations in the south and southwestern portions of Wyoming.

## Confidential Client 06840 - 2015 Rasmussen Valley DEIS
**Confidential Client 06840, Soda Springs, Idaho**

Assisted with entering comments that were received from the Bureau of Land Management addressing the Rasmussen Valley Project's Draft EIS. Each comment was entered in the database, and sorted based on the issue it was addressing or referring to in the Draft EIS.

## Bluestem Wind Farm Construction Oversight
**Exelon Corporation, Beaver County, Oklahoma**

Performed field monitoring, permitting and planning for the construction phase of the Bluestem Wind Farm project. Field visits were conducted as needed to address SPCC, SWPPP BMPs, environmental constraints, and changes requested by the construction contractors. Taking field notes and photos and preparing a summary memo of each visit to inform the client of construction progress, changes made, and issues or concerns addressed.

## North and South Maybe Mines 2016 Fieldwork & 2017 Reporting
**Confidential Client 06840, Soda Springs, Idaho**

Participated in small mammal trapping on six to seven grids in the South and North Maybe Mines. Conducted avian point count surveys on adjacent mine sites. Entered field data in Excel upon completion of field surveys. Assisted with the reporting process for both mine sites.

## DTSC/Exide Project Winter 2017
**Confidential Client, Los Angeles, California**

Data entry and figure quality assurances were completed.

## Tailing Facility Vegetation and Wildlife Studies
**Confidential Client (00701), Questa, New Mexico**

Conducted gopher mound field surveys in June 2016 and vegetation collocation field surveys in August 2016. Currently assisting in elk game camera installation task for elk absence presence survey at tailing facility.

## System wide Tower Assessment Program 2016 and ongoing
**Confidential Client (01534), Various Locations, California**

Conducted paint sampling surveys on transmission towers from northern California to Bakersfield, CA. Currently supporting the remediation field effort.

## Project Experience Continued

### TLRR Biological Surveys
**Southern California Edison, Various Locations, Southern California**

Hiked along transmission lines and conducted biological surveys, which incorporated documenting sensitive wildlife with emphasis on Desert Tortoises and plant species. Also assisted with bio-monitoring for the soil boring phase.

### Wetland Surveys
**Owl Ridge, Winter Park, Colorado**

Assisted in wetland surveys in Winter Park, Colorado.

### Groundwater Monitoring Reports - ongoing
**Confidential Clients, Wyoming and Kansas**

Currently assisting with the reporting process of completed groundwater monitoring events for multiple sites located in Wyoming and Kansas on a semi-annual and yearly basis.

### Southern Nevada Surveys - ongoing
**Southwestern Gas, Southern Nevada**

Biological surveys were conducted along a proposed pipeline south of Las Vegas to Laughlin. Waters of the U.S. surveys were also conducted. Assisted with the Mojave Desert Tortoise Report and Biological Memo.

### Wetland and Biological Survey
**Kinder Morgan, Northern Colorado**

Conducted wetland and biological survey on a proposed expansion to an existing compression station in northern Colorado.

## Experience outside of Arcadis

### Peninsular Bighorn Sheep Field Surveys
**Bighorn Institute, Palm Desert, California**

Performed field surveys for a non-profit organization that focuses its research on the Peninsular desert bighorn and conducts a captive breeding and wild population augmentation program. Fieldwork incorporated tracking radio-collared endangered Peninsular Bighorn Sheep in the northern Santa Rosa Mountains (NSRM) and San Jacinto Mountains (SJM) by means of telemetry. Investigated sheep mortalities in the NSRM and SJM. Participated in the release of captive herd yearlings into the wild Peninsular bighorn sheep population of the NSRM and SJM. Contributed to a capture and re-collaring effort for non-functioning radio-collared sheep and radio-collaring wild sheep.

# Project Experience Continued

## Ecotourism Volunteer

**Peace Corps - Environmental Sector, Trelawny,**

Stationed as a volunteer at Southern Trelawny Environmental Agency in Jamaica, working alongside local colleagues on ecotourism. Educated the local community about ecotourism and sustainability.

## Seasonal Work

**USDA Forest Service, Southwestern Montana,**

In summer 2001, worked in Wisdom, Montana, on surveys conducted in and around lake(s)/pond(s) to determine the presence or absence of amphibians in the water area in the Wisdom and Wise River Ranger District. Collected water samples and performed pH and conductivity tests on the water source. Performed stream surveys, culvert measurements and electro-shocking in summer 2002. Took culvert measurements to determine suitability of water flow during high and low flows. Conducted electro-shocking at streams to determine the presence or absence of west-slope cutthroat. Fought forest fires as a ground crew member. During summer 2003 in Darby, Montana, retrieved lynx pads and conducted goshawk calling to determine nesting locations. Conducted Flammulated Owl surveys in the evenings to document distribution in the area. Also, performed peregrine falcon surveys and bird banding. During summer 2004 in Butte, Montana, conducted fieldwork on streams that had potential west-slope cutthroat habitat. Performed electrofishing to determine the presence or absence of west-slope cutthroat in streams. Surveyed streams that contained west-slope cutthroat to determine habitat distribution and suitability. In addition to season work, assisted part-time at the USDA Forest Service Regional One office in Missoula, Montana, from fall 2001 to spring 2005.

PERSONNEL RESUME

ARCADIS Design & Consultancy for natural and built assets

# LAUREN SWIERK

**EDUCATION**

MS Environmental Science Indiana University-Bloomington 2015
BS Environmental Science Indiana University-Bloomington 2014

**YEARS OF EXPERIENCE**

Total – 2.5 years
With ARCADIS – 2.5 years

**PROFESSIONAL TRAINING**

OSHA 40-Hour HAZWOPER, 2015 (Latest refresher - 2017)

MSHA, 2017

HAZMAT #1, 2017

First Aid/CPR/AED, 2016

OSHA 10-Hour Construction, 2016

OSHA Site Supervisor, 2015

Lauren Swierk has 2.5 years of professional experience. She has worked on a wide range of projects with focus on groundwater monitoring, groundwater remediation, biological field surveys and desktop flood analysis.

## Project Experience

### Biological Field Surveys
**Various Oil & Gas Clients, New Mexico (2016- )**

Worked with a team to complete biological field surveys for proper placement of well pads at various places in southern New Mexico.

### Groundwater Monitoring
**General Electric, Greenville, SC (2016- )**

Assist with the development of groundwater sampling plans, field coordination, sample tracking, and groundwater monitoring reports. Support with budget tracking, financial planning and invoicing.

### Groundwater Remediation
**Pitch Reclamation Project (2015- )**

Conduct phosphorus injections to remediate groundwater. Repair system and collect groundwater and surface water samples using Grundfos pump, bailer, or Hydrasleeve. Assist in report preparation and budget tracking.

### Environmental Monitoring
**Chevron, Questa, NM (2015- )**

Conduct O&M activities including: runoff data collection, groundwater sampling, Sonde & system repair and calibration. Assist with other tasks such as pump installation and wildlife studies. Aid in data analysis and report writing.

### Pipeline Crossing Analysis
**Various Clients (2016- )**

Work with HEC-SSP, FEMA flood data, and Google Earth to determine pipeline risk rankings based on scour, erosion and avulsion.

## Groundwater Monitoring
**Marathon Petroleum, Bennett, CO (2015- )**

Assist in sample event planning, data analysis and report development. Compile reimbursement packages for Colorado Oil and Public Safety Tank Storage Fund.

## Annual Report Development
**Agrium, Soda Springs, ID (2015- )**

Assist with many tasks related to the development of DSR and RIFFS reports including constituent trend charts, hydrograph data interpretation, table generation and report QC.

## SPCC Plan Development
**Enbridge Energy Partners, L.P., Buffalo, Wyoming (2016)**

Worked with a team to develop Spill Prevention, Control and Countermeasures plans for multiple locations in the Chicago region.

## CalRecycle Wildfires
**California Environmental Protection Agency, Lake County, California (2015)**

Supported restoration of wildfires in northern California. Tasks included site assessments, communication of potential hazards and property owner requests to debris removal crews, and organization of documentation. Served as the on-site safety officer.

## Emergency Release Response
**Confidential Client, Midland, Texas (2015)**

Worked with the community to improve water quality by sampling groundwater and installing filtration systems. Organized documentation and helped provide information to inform residents of water quality.

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

Temporary Pit containing non-low chloride fluids

Javelina Unit P433 Pit

Section 12, 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

CLEAR SOLUTIONS™

**Report of Geotechnical Study**

**Sand Dunes Impoundments**

**Eddy County, New Mexico**

*Prepared for:*
**Mr. Caleb Weaver**
**Chevron North America – MCBU**
**Exploration and Production Company**
*6301 Deauville Blvd, Midland, TX 79706*
*Phone: (432) 687-7258*

*Prepared by:*

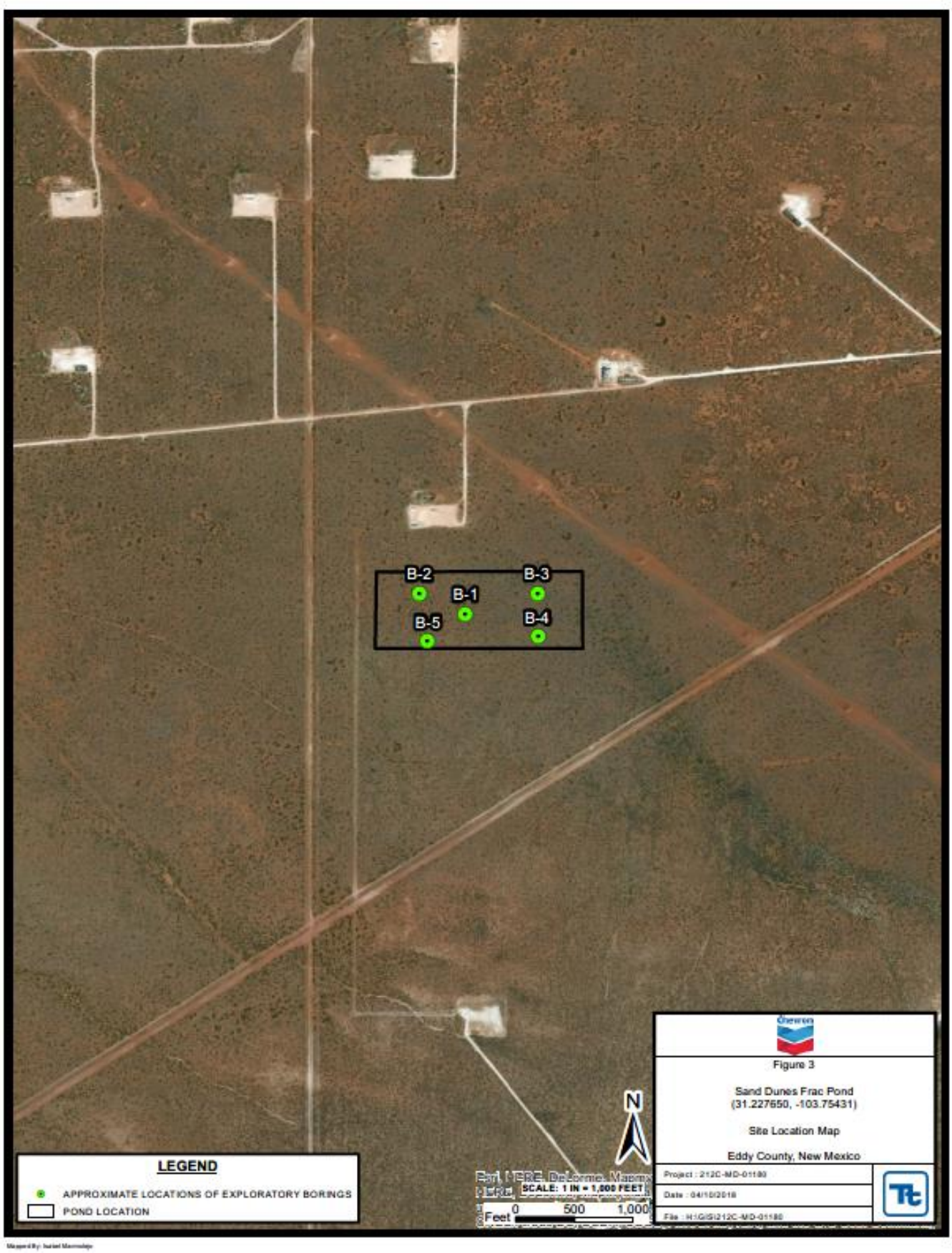
**Tetra Tech**

*4000 North Big Spring Street, Suite 401*
*Midland, Texas 79705*
*Phone (432) 682-4559; Fax (432) 682-3946*

Tetra Tech Project No. 212C-MD-01180


Thomas A. Chapel, CPG, PE
Principal Engineer

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


B-2
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LEGEND
APPROXIMATE LOCATIONS OF EXPLORATORY BORINGS
POND LOCATION
Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
SCALE: 1 IN = 1,000 FEET
0 500 1,000
Feet
Figure 3
Sand Dunes Frac Pond
(31.227650, -103.75431)
Site Location Map
Eddy County, New Mexico
Project : 212C-MD-01180
Date : 04/10/2018
File : H:\GIS\212C-MD-01180

# APPENDIX A

# EXPLORATORY BORING LOGS

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

# BOREHOLE ID: B-1



**CLIENT** Chevron **PROJECT NAME** Sand Dunes Frac Pond

**PROJECT NUMBER** 212C-MD-01180 **PROJECT LOCATION** Eddy County, New Mexico

**DATE(S) OF DRILLING: 04/04/2018** **GROUND ELEVATION: NA** **METHOD:**

**CONSULTANT: Tetra Tech, Inc.** **LATITUDE: 32.227650 N** **LOGGED BY: Clint Merritt**

**DRILLING CONTRACTOR: TWE** **LONGITUDE: 103.754310 W** **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 | 2-3-4 | | | | Loose to Very Dense, Light Brown to White, Fine Grained **SILTY SAND**, with Caliche, Dry to Slightly Moist |
| 5 | CA | 9-23-26 | MC = 7.0%<br>DD = 79.1 pcf<br>LL = NP<br>PL = NP<br>PI = NP<br>Fines = 28.3% | SM | | |
| | CA | 11-22-50/5" | | | | |
| 10 | CA | 37-31-50/5" | MC = 5.3%<br>DD = 88.5 pcf<br>LL = NP<br>PL = NP<br>PI = NP<br>Fines = 17.9% | SM | | 10.0 |
| | CA | 50/0" | | | | Hard, Red to Green Gray and White, **CLAY**, Low Plasticity, Slightly Moist |
| 15 | | | | | | |
| | CA | 50/4" | | | | |
| 20 | | | | | | |
| | CA | 50/0" | | | | |
| 25 | | | | | | |
| | CA | 50/6" | MC = 9.8%<br>LL = 39<br>PL = 20<br>Fines = 60.7% | CL | | |
| 30 | | | | | | |

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

*(Continued Next Page)*

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

**BOREHOLE ID: B-1**
PAGE 2 OF 3

**CLIENT** Chevron
**PROJECT NAME** Sand Dunes Frac Pond
**PROJECT NUMBER** 212C-MD-01180
**PROJECT LOCATION** Eddy County, New Mexico

| DEPTH (ft) | SAMPLE TYPE | BLOW COUNTS | TESTS | U.S.C.S. | GRAPHIC LOG | MATERIAL DESCRIPTION |
|---|---|---|---|---|---|---|
| 35 | | | | | | Hard, Red to Green Gray and White, **CLAY**, Low Plasticity, Slightly Moist *(continued)* |
| 40 | CA | 50/3" | | | | |
| 45 | | | | | | |
| 50 | CA | 50/2" | | | | |
| 55 | | | | | | |
| 60 | CA | 50/2" | | | | |
| 65 | | | | | | |

BOREHOLE/TP/WELL - TT SAND DUNE FRAC POND.GPJ LAB SUMMARY.GDT 5/18/16

*(Continued Next Page)*

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-1**
PAGE 3 OF 3

**CLIENT** Chevron **PROJECT NAME** Sand Dunes Frac Pond

**PROJECT NUMBER** 212C-MD-01180 **PROJECT LOCATION** Eddy County, New Mexico

| 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, **CLAY**, Low Plasticity, Slightly Moist *(continued)* |
| 75 | | | | | | |
| 80 | CA | 50/0" | | | | 80.0 |
| | | | | | | Borehole terminated at 80.0 ft. |

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

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 NAME** Sand Dunes Frac Pond

**PROJECT NUMBER** 212C-MD-01180 **PROJECT LOCATION** Eddy County, New Mexico

**DATE(S) OF DRILLING: 04/04/2018** **GROUND ELEVATION: NA** **METHOD:**

**CONSULTANT: Tetra Tech, Inc.** **LATITUDE: 32.227600 N** **LOGGED BY: Clint Merritt**

**DRILLING CONTRACTOR: TWE** **LONGITUDE: 103.754300 W** **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 | | SM | | Loose to Very Dense, Light Brown to White to Pink, Fine Grained **SILTY SAND**, Caliche/Calcareous, Dry |
| 5 | ST | | | | | |
| | CA | 8-3-3 | MC = 5.0%<br>DD = 72.3 pcf<br>LL = NP<br>PL = NP<br>PI = NP<br>Fines = 24.0% | | | |
| 10 | CA | 14-50/4" | | | | |
| 15 | | 20-50/3" | | | | |
| 20 | | 50/4" | | | | |
| 25 | | 50/0" | | | | |
| 30 | | 50/0" | | | | 30.0 Borehole terminated at 30.0 ft. |

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

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-3

PAGE 1 OF 1

**CLIENT** Chevron **PROJECT NAME** Sand Dunes Frac Pond

**PROJECT NUMBER** 212C-MD-01180 **PROJECT LOCATION** Eddy County, New Mexico

**DATE(S) OF DRILLING: 04/05/2018** **GROUND ELEVATION: NA** **METHOD:**

**CONSULTANT: Tetra Tech, Inc.** **LATITUDE: 32.228110 N** **LOGGED BY: Clint Merritt**

**DRILLING CONTRACTOR: TWE** **LONGITUDE: 103.752610 W** **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 | 3-5-7 | MC = 3.6%<br>LL = 29<br>PL = 14<br>PI = 15<br>Fines = 28.3%<br>Eff. Phi = 33.4 deg<br>Eff. C = 164.6 psf | SC | | Medium Dense to Very Dense, Red to Light Brown, Fine Grained **CLAYEY to SILTY SAND**, Variable Plasticity from None to Low, Dry to Slightly Moist, with Caliche |
| 5 | CA | 5-6-10 | | | | |
| | CA | 5-11-12 | | | | |
| 10 | CA | 10-12-12 | | | | |
| 15 | CA | 3-3-4 | MC = 5.2%<br>LL = NP<br>PL = NP<br>PI = NP<br>Fines = 20.2% | SM | | |
| 20 | ST | | | | | |
| 25 | CA | 50/0" | | | | |
| 30 | CA | 50/0" | | | | 30.0<br>Borehole terminated at 30.0 ft. |

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

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-4

PAGE 1 OF 1

**CLIENT** Chevron **PROJECT NAME** Sand Dunes Frac Pond

**PROJECT NUMBER** 212C-MD-01180 **PROJECT LOCATION** Eddy County, New Mexico

**DATE(S) OF DRILLING: 04/05/2018** **GROUND ELEVATION: NA** **METHOD:**

**CONSULTANT: Tetra Tech, Inc.** **LATITUDE: 32.227120 N** **LOGGED BY: Clint Merritt**

**DRILLING CONTRACTOR: TWE** **LONGITUDE: 103.752600 W** **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 | | | | | | Loose to Very Dense, Red to Light Brown, Fine Grained **CLAYEY to SILTY SAND**, Variable Plasticity from None to Low, Dry, with Caliche |
| | CA | 2-2-3 | MC = 3.4%<br>DD = 96.4 pcf<br>LL = NP<br>PL = NP<br>PI = NP<br>Fines = 16.3% | SM | | |
| 5 | CA | 3-3-10 | MC = 6.0%<br>DD = 85.1 pcf<br>LL = 24<br>PL = 15<br>PI = 9<br>Fines = 31.1% | SC | | |
| | CA | 14-50/3" | | | | |
| 10 | CA | 50/2" | | | | |
| 15 | CA | 11-15-31 | MC = 3.1%<br>LL = NP<br>PL = NP<br>PI = NP<br>Fines = 12.1% | SM | | |
| 20 | CA | 50/0" | | | | |
| 25 | CA | 50/0" | | | | |
| 30 | CA | 50/0" | | | | 30.0 |
| | | | | | | Borehole terminated at 30.0 ft. |

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

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-5

PAGE 1 OF 1

**CLIENT** Chevron **PROJECT NAME** Sand Dunes Frac Pond

**PROJECT NUMBER** 212C-MD-01180 **PROJECT LOCATION** Eddy County, New Mexico

**DATE(S) OF DRILLING: 04/05/2018** **GROUND ELEVATION: NA** **METHOD:**

**CONSULTANT: Tetra Tech, Inc.** **LATITUDE: 32.227020 N** **LOGGED BY: Clint Merritt**

**DRILLING CONTRACTOR: TWE** **LONGITUDE: 103.755200 W** **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 | 1-2-7 | MC = 2.6%<br>LL = NP<br>PL = NP<br>PI = NP<br>Fines = 14.9% | SM | | Loose to Very Dense, Red to Light Brown, Fine Grained **SILTY SAND**, Dry to Slightly Moist, with Caliche |
| 5 | CA | 10-18-28 | | | | |
| | CA | 27-50/4" | | | | |
| 10 | CA | 50/2" | | | | 10.0 |
| | | | | | | Dense to Very Dense, Light Brown, **CLAYEY GRAVEL**, Slightly Moist |
| 15 | CA | 11-17-21 | | | | |
| 20 | CA | 31-33 | MC = 9.2%<br>LL = 32<br>PL = 20<br>PI = 12<br>Fines = 45.7% | GC | | 20.0 |
| | CA | 50/0" | | | | Very Dense, Red to Light Brown, Fine Grained **SILTY SAND**, Slightly Moist, with Caliche |
| 25 | | | | | | |
| | CA | 50/0" | | | | |
| 30 | | | | | | 30.0 |
| | | | | | | Borehole terminated at 30.0 ft. |

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

# APPENDIX B

# LABORATORY SUMMARY

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

# SUMMARY OF LABORATORY RESULTS



**CLIENT** Chevron **PROJECT NAME** Sand Dunes Frac Pond

**PROJECT NUMBER** 212C-MD-01180 **PROJECT LOCATION** Eddy County, New Mexico

| Borehole Identification | Depth | Water Content (%) | Dry Density (pcf) | Atterberg's Limits (LL/PL/PI) | Max Dry Density (pcf)/ OMC(%) | Fines Content (%) | USCS Classi-fication | Swell (%), Swell pressure (psf) | Cc, Cs | 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 P433 Pit

Section 12, T24S, R31E

# United States Department of the Interior
# Bureau of Land Management

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

**NM-141811**

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

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

BLM

Carlsbad Field Office

**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.

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- **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).

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.

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

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

Draft New Mexico GHG Inventory and Reference Case Projection – June 2005.
(Available on the Internet: http://www.nmclimatechange.us/ewebeditpro/items/O117F6527.pdf)

EPA Inventory of US Greenhouse Gas Emissions and Sinks: 1990-2006.
Environmental Protection Agency, Washington, D.C.

## Venegas, Victoria, EMNRD

**From:** Venegas, Victoria, EMNRD
**Sent:** Wednesday, May 25, 2022 3:54 PM
**To:** Vallejo, Tony; Zemen, Jessica
**Cc:** Enviro, OCD, EMNRD
**Subject:** JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037]
**Attachments:** C-144. JAVELINA UNIT 433 (433H, 434H, 435H) [fVV2214553037].pdf

**JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037].**
**Temporary Pit non-low chloride fluids.**

NMOCD has reviewed [4323] CHEVRON USA INC's, Application and Form C-144 received on May 2, 2022, for the proposed JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037], Temporary Pit with non-low chloride drilling fluid in Unit Letter E, Section 12, 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 three (3) wells drilled from the JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] pit.

2. [4323] CHEVRON USA INC shall use the facility identification number [fVV2214553037] in all communications with OCD regarding JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] Pit.

3. [4323] CHEVRON USA INC shall design, construct, operate, maintain, and close JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 months after the date of any of the following events, [4323] CHEVRON USA INC shall close JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037]:

    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 dewaters JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] 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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037].

19. No later than seventy-two (72) hours prior to installing the top geomembrane cover and cover soil on the JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037], [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 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] in all future communications.
Please let me know if you any additional questions or concerns.
Sincerely,

**Victoria Venegas** ● Environmental Specialist
Environmental Bureau
EMNRD - Oil Conservation Division
(575) 909-0269 | Victoria.Venegas@state.nm.us
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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 103155

## CONDITIONS

| | |
|---|---|
| Operator:<br>CHEVRON U S A INC<br>6301 Deauville Blvd<br>Midland, TX 79706 | OGRID:<br>4323 |
| | Action Number:<br>103155 |
| | Action Type:<br>[C-144] Temporary Pit Plan (C-144T) |

**CONDITIONS**

| Created By | Condition | Condition Date |
|---|---|---|
| vvenegas | NMOCD has reviewed [4323] CHEVRON USA INC's, Application and Form C-144 received on May 2, 2022, for the proposed JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037], Temporary Pit with non-low chloride drilling fluid in Unit Letter E, Section 12, Township 24S Range 31E, Eddy County, New Mexico. 3. [4323] CHEVRON USA INC shall design, construct, operate, maintain, and close JAVELINA UNIT 433 (433H, 434H, 435H) FACILITY ID [fVV2214553037] Pit in compliance with 19.15.17 NMAC - Pits, Closed-Loop Systems, Below-Grade-Tanks and Sumps. | 5/25/2022 |