Incident Number: nAPP2325425842

# Release Assessment and Closure

Harroun Ranch West Battery

**Section 20, Township 23 South, Range 29 East**

**County: Eddy**

**Vertex File Number: 23E-05202**

**Prepared for:**

BTA Oil Producers, LLC

**Prepared by:**

Vertex Resource Services Inc.

**Date:**

October 2023

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**Release Assessment and Closure**

**Harroun Ranch West Battery**
**Section 20, Township 23 South, Range 29 East**
**County: Eddy**

Prepared for:
**BTA Oil Producers**
104 S. Pecos
Midland, Texas 79701

**New Mexico Oil Conservation Division – District 2**
811 S. 1st Street
Artesia, New Mexico 88210

Prepared by:
**Vertex Resource Services Inc.**
3101 Boyd Drive
Carlsbad, New Mexico 88220

Hunter Klein — 10/19/2023

Hunter Klein, B.Sc. — Date
ENVIRONMENTAL TECHNICIAN, REPORTING

Chance Dixon — 10/19/2023

Chance Dixon, B.Sc. — Date
PROJECT MANAGER, REPORT REVIEW



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## 1.0 Introduction

BTA Oil Producers (BTA) retained Vertex Resource Services Inc. (Vertex) to conduct a Release Assessment and Closure for a produced water and crude oil release that occurred on September 10, 2023, at Harroun Ranch West Battery (hereafter referred to as the "site") facility ID: fAPP2129830816. BTA submitted an initial C-141 Release Notification (Appendix A) to New Mexico Oil Conservation Division (NMOCD) District 2 on September 11, 2023. Incident ID number nAPP2325425842 was assigned to this incident.

This report provides a description of the release assessment and liner inspection activities associated with the site. The information presented demonstrates that closure criteria established in Table I of 19.15.29.12 of the *New Mexico Administrative Code* (NMAC; New Mexico Oil Conservation Division, 2018) related to NMOCD has been met and all applicable regulations are being followed. This document is intended to serve as a final report to obtain approval from NMOCD for the closure of this release as per NMAC 19.15.29.13.

## 2.0 Incident Description

The release occurred on September 10, 2023, due to a plug in the water leg to the Gun Barrel Tank, which caused the skim tank to overflow into the lined secondary containment. The incident was reported on September 11, 2023, and involved the release of 100 barrels of crude oil and 40 barrels of produced water into lined containment. Approximately 100 barrels of crude oil and 40 barrels of produced water were recovered during the initial clean-up, and it was determined that all of the release fluids remained in the containment. Additional details relevant to the release are presented in the C-141 Report.

## 3.0 Site Characteristics

The site is located approximately 5.2 miles east of Loving, New Mexico (Google Inc., 2023). The legal location for the site is Section 20, Township 23 South and Range 29 East in Eddy County, New Mexico. The release area is located on Bureau of Land Management property. An aerial photograph and site schematic are presented on Figure 1.

*The Geological Map of New Mexico* (New Mexico Bureau of Geology and Mineral Resources, 2023) indicates the site's surface geology primarily comprises Qp – Piedmont alluvial deposits. The predominant soil texture on the site is Simona-Bippus complex, 0 to 5% slopes. Additional soil characteristics include a drainage class of well drained with a runoff class of very low. The karst geology potential for the site is medium (United States Department of the Interior, Bureau of Land Management, 2018).

The location is typical of oil and gas exploration and production sites in the Permian Basin and is currently used for oil and gas production and storage. The following sections specifically describe the release area of the site (Figure 1).

The surrounding landscape is associated with flood plains and alluvial fans with elevations ranging between 2,500 and 4,500 feet. The climate is semiarid with average annual precipitation ranging between 8 and 14 inches. Using information from the United States Department of Agriculture, the dominant vegetation was determined to be grasses with shrubs and half-shrubs (United States Department of Agriculture, Natural Resources Conservation Service, 2023). Limited to no vegetation is allowed to grow on the compacted production pad, right-of-way and access road.



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## 4.0 Closure Criteria Determination

The nearest active well to the site is a New Mexico Office of the State Engineer (NMOSE) monitoring well located approximately 1.01 miles southwest of the site (United States Geological Survey, 2023). Data from 2013 shows the NMOSE borehole recorded a depth to groundwater of 44 feet below ground surface. Information pertaining to the depth to groundwater determination is included in Appendix B.

There is no surface water present at the site. The nearest significant watercourse, as defined in Subsection P of 19.15.17.7 NMAC, is a lakebed (National Wetlands Inventory) located approximately 1.08 miles northwest of the site (United States Fish and Wildlife Service, 2023).

At the site, there are no continuously flowing watercourses or significant watercourses, lakebeds, sinkholes, playa lakes or other critical water or community features as outlined in Paragraph (4) of Subsection C of 19.15.29.12 NMAC.



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| **Table 1. Closure Criteria Worksheet** | | | |
|---|---|---|---|
| **Site Name: Harroun Ranch West Battery** | | | |
| **Spill Coordinates: 32.28333, -104.00263** | | **X: 32.28333** | **Y: -104.00263** |
| **Site Specific Conditions** | | **Value** | **Unit** |
| 1 | Depth to Groundwater | **44 feet** | feet |
| 2 | Within 300 feet of any continuously flowing watercourse or any other significant watercourse | 5,689 | feet |
| 3 | Within 200 feet of any lakebed, sinkhole or playa lake (measured from the ordinary high-water mark) | 1,543 | feet |
| 4 | Within 300 feet from an occupied residence, school, hospital, institution or church | 9,687 | feet |
| 5 | i) Within 500 feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, **or** | 2,461 | feet |
| | ii) Within 1000 feet of any fresh water well or spring | | feet |
| 6 | Within incorporated municipal boundaries or within a defined municipal fresh water field covered under a municipal ordinance adopted pursuant to Section 3-27-3 NMSA 1978 as amended, unless the municipality specifically approves | No | (Y/N) |
| 7 | Within 300 feet of a wetland | 3,152 | feet |
| 8 | Within the area overlying a subsurface mine | No | (Y/N) |
| 9 | Within an unstable area (Karst Map) | Medium | Critical<br>High<br>Medium<br>Low |
| 10 | Within a 100-year Floodplain | 500 | year |
| 11 | Soil Type | Gravelly Fine to Sandy Loam | |
| 12 | Ecological Classification | Simona-Bippus | |
| 13 | Geology | Qp | |
| | **NMAC 19.15.29.12 E (Table 1) Closure Criteria** | <50' | <50'<br>51-100'<br>>100' |

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The closure criteria determined for the site are associated with the following constituent concentration limits as presented in Table 2.

**Table 2. Closure Criteria for Soils Impacted by a Release**

| Minimum depth below any point within the horizontal boundary of the release to groundwater less than 10,000 mg/l TDS | Constituent | Limit |
|---|---|---|
| < 50 feet | Chloride | 600 mg/kg |
| | TPH (GRO+DRO+MRO) | 100 mg/kg |
| | BTEX | 50 mg/kg |
| | Benzene | 10 mg/kg |

TDS – total dissolved solids
TPH – total petroleum hydrocarbons, GRO – gas range organics, DRO – diesel range organics, MRO – motor oil range organics
BTEX – benzene, toluene, ethylbenzene and xylenes

## 5.0 Liner Inspection

Notification that a liner inspection was scheduled to be completed was provided to the NMOCD on September 21, 2023, and a request to reschedule the inspection was provided on September 25, 2023. Visual observation of the liner was completed on all sides and the base of the containment, around equipment, and of all seams in the liner. As evidenced in the Daily Field Report (Appendix C), it was verified that the liner was intact and had the ability to contain the release. The Daily Field Report with photographs of the liner inspection is included in Appendix C. The Liner Inspection Notification emails are included in Appendix D.

## 6.0 Closure Request

Vertex recommends no remediation action to address the release at the site. The secondary containment was intact and contained the release. There are no anticipated risks to human, ecological, or hydrological receptors associated with the release site.

Vertex requests that this incident (nAPP2325425842) be closed as all closure requirements set forth in Subsection E of 19.15.29.12 NMAC have been met. BTA certifies that all information in this report and the appendices are correct and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NMOCD requirements to obtain closure on the release at the site.

Should you have any questions or concerns, please do not hesitate to contact Chance Dixon at 575.988.1472 or cdixon@vertex.ca.



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## 7.0 References

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## 8.0 Limitations

This report has been prepared for the sole benefit of BTA Oil Producers. This document may not be used by any other person or entity, with the exception of the New Mexico Oil Conservation Division and the Bureau of Land Management, without the express written consent of Vertex Resource Services Inc. (Vertex) and BTA Oil Producers. Any use of this report by a third party, or any reliance on decisions made based on it, or damages suffered as a result of the use of this report are the sole responsibility of the user.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgement of Vertex based on the data collected during the assessment. Due to the nature of the assessment and the data available, Vertex cannot warrant against undiscovered environmental liabilities. Conclusions and recommendations presented in this report should not be considered legal advice.



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# FIGURE


Release Area in Containment (~9,619 sq.ft.)

VERTEX

0 15 30 ft

Map Center:
Lat/Long: 32.285858, -104.006498

NAD 1983 UTM Zone 13N

Date: Oct 10/23

N

**Characterization Site Schematic**
**Harroun Ranch West Tank Battery**

FIGURE:

**1**

BTA

Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

Note: Georeferenced image from Esri, 2022. Approximate lease boundary from imagery by Vertex Professional Services Ltd. (Vertex), 2023. Site features from GPS by Vertex, 2023.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECT\BTA Oil Producers LLC\2023\BTA - Harroun\Figure 1 Characterization Schematic (23E-05202).mxd

# APPENDIX A - NMOCD C-141 Report

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

State of New Mexico
Energy Minerals and Natural Resources Department

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

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

| | |
|---|---|
| Incident ID | nAPP2325425842 |
| District RP | |
| Facility ID | fAPP2129830816 |
| Application ID | |

# Release Notification

## Responsible Party

| | |
|---|---|
| Responsible Party: BTA Oil Producers | OGRID: 260297 |
| Contact Name: Kelton Beaird | Contact Telephone: 432-312-2203 |
| Contact email: kbeaird@btaoil.com | Incident # *(assigned by OCD): nAPP2325425842* |
| Contact mailing address 104 S. Pecos, Midland, TX 79701 | |

## Location of Release Source

Latitude 32.28333 Longitude -104.00263
*(NAD 83 in decimal degrees to 5 decimal places)*

| | |
|---|---|
| Site Name: Harroun Ranch West Battery | Site Type: Tank Battery |
| Date Release Discovered: 9-10-2023 | API# *(if applicable)* |

| Unit Letter | Section | Township | Range | County |
|---|---|---|---|---|
| P | 20 | 23S | 29E | Eddy |

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

## Nature and Volume of Release

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

| | | |
|---|---|---|
| ☒ Crude Oil | Volume Released (bbls) 100 | Volume Recovered (bbls) 100 |
| ☒ Produced Water | Volume Released (bbls) 40 | Volume Recovered (bbls) 40 |
| | Is the concentration of dissolved chloride in the produced water >10,000 mg/l? | ☐ Yes ☐ No |
| ☐ Condensate | Volume Released (bbls) | Volume Recovered (bbls) |
| ☐ Natural Gas | Volume Released (Mcf) | Volume Recovered (Mcf) |
| ☐ Other (describe) | Volume/Weight Released (provide units) | Volume/Weight Recovered (provide units) |

Cause of Release:
The water leg to the Gun Barrel Tank clogged with sand, causing the skim tank to overflow. All fluid remained inside the lined secondary containment. A vac truck recovered all released fluid.

The amount was determined by a tank gauge following recovery of fluids.

State of New Mexico
Oil Conservation Division

| | |
|---|---|
| Incident ID | |
| District RP | |
| Facility ID | |
| Application ID | |

| | |
|---|---|
| Was this a major release as defined by 19.15.29.7(A) NMAC?<br><br>☒ Yes ☐ No | If YES, for what reason(s) does the responsible party consider this a major release?<br>25 barrels or greater |
| If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? Yes, by Kelton Beaird, to Mike Bratcher, Robert Hamlet, OCD Enviro, by email. | |

## Initial Response

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

☒ The source of the release has been stopped.

☐ The impacted area has been secured to protect human health and the environment.

☐ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.

☐ All free liquids and recoverable materials have been removed and managed appropriately.

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

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

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

Printed Name: __Kelton Beaird_____ Title: _____Environmental Manager_____

Signature: _____ Date: _____9-11-2023_____

email: ___kbeaird@btaoil.com_____ Telephone: ___432-312-2203_____

**OCD Only**

Received by: _____ Date: _____

State of New Mexico
Oil Conservation Division

| | |
|---|---|
| Incident ID | nAPP2325425842 |
| District RP | |
| Facility ID | |
| Application ID | |

# Site Assessment/Characterization

*This information must be provided to the appropriate district office no later than 90 days after the release discovery date.*

| | |
|---|---|
| What is the shallowest depth to groundwater beneath the area affected by the release? | 44 (ft bgs) |
| Did this release impact groundwater or surface water? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church? | ☐ Yes ☒ No |
| Are the lateral extents of the release 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? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 1000 feet of any other fresh water well or spring? | ☐ Yes ☒ No |
| Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field? | ☐ Yes ☒ No |
| Are the lateral extents of the release within 300 feet of a wetland? | ☐ Yes ☒ No |
| Are the lateral extents of the release overlying a subsurface mine? | ☐ Yes ☒ No |
| Are the lateral extents of the release overlying an unstable area such as karst geology? | ☐ Yes ☒ No |
| Are the lateral extents of the release within a 100-year floodplain? | ☐ Yes ☒ No |
| Did the release impact areas **not** on an exploration, development, production, or storage site? | ☐ Yes ☒ No |

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

**Characterization Report Checklist**: ***Each of the following items must be included in the report.***

- ☒ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☒ Field data
- ☒ n/a Data table of soil contaminant concentration data
- ☒ Depth to water determination
- ☒ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☒ n/a Boring or excavation logs
- ☒ Photographs including date and GIS information
- ☒ Topographic/Aerial maps
- ☒ n/a Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

Form C-141
Page 4

State of New Mexico
Oil Conservation Division

| | |
|---|---|
| Incident ID | nAPP2325425842 |
| District RP | |
| Facility ID | |
| Application ID | |

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

Printed Name: Kelton Beaird Title: Environmental Manager

Signature: Date: 10-23-23

email: KBeaird@btaoil.com Telephone: 432-312-2203

**OCD Only**

Received by: Shelly Wells Date: 10/23/2023

| | |
|---|---|
| Incident ID | nAPP2325425842 |
| District RP | |
| Facility ID | |
| Application ID | |

# Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

**Closure Report Attachment Checklist**: ***Each of the following items must be included in the closure report.***

[n/a] A scaled site and sampling diagram as described in 19.15.29.11 NMAC

[n/a] Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection)

[n/a] Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

[X] Description of remediation activities

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Kelton Beaird Title: Environmental Manager

Signature: Date: 10-23-23

email: KBeaird@btaoil.com Telephone: 432-312-2203

**OCD Only**

Received by: Shelly Wells Date: 10/23/2023

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: Date:

Printed Name: Title:

# APPENDIX B – Closure Criteria Research Documentation

# *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 | Code | POD Sub-basin | County | Q 64 | Q 16 | Q 4 | Sec | Twn | Rng | X | Y | Distance | Depth Well | Depth Water | Water Column |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C 02613 | | CUB | ED | 4 | 4 | 2 | 20 | 23S | 29E | 594203 | 3573176* | 942 | 400 | | |
| C 02721 | | CUB | ED | | 2 | 3 | 21 | 23S | 29E | 594915 | 3572879* | 1164 | 150 | | |
| C 03057 EXPLORE | | CUB | ED | 4 | 1 | 1 | 21 | 23S | 29E | 594605 | 3573586* | 1477 | 150 | | |
| C 03587 POD1 | | CUB | ED | 1 | 4 | 3 | 29 | 23S | 29E | 593338 | 3570754 | 1630 | 99 | 44 | 55 |
| C 02707 | | C | ED | | | 2 | 28 | 23S | 29E | 595535 | 3571868* | 1668 | 40 | 18 | 22 |
| C 02720 | | CUB | ED | | 2 | 1 | 21 | 23S | 29E | 594911 | 3573690* | 1726 | 150 | | |
| C 03587 POD2 | | CUB | ED | 1 | 2 | 4 | 19 | 23S | 29E | 592213 | 3572706 | 1757 | 77 | 16 | 61 |
| C 02182 | | C | ED | | | 4 | 30 | 23S | 29E | 592328 | 3571048* | 2010 | 75 | 30 | 45 |
| C 02608 | | CUB | ED | 3 | 1 | 4 | 17 | 23S | 29E | 593598 | 3574387* | 2133 | 400 | | |
| C 01627 | | C | ED | 1 | 4 | 4 | 28 | 23S | 29E | 595649 | 3570959* | 2176 | 170 | | |
| C 03059 EXPLORE | | CUB | ED | 4 | 1 | 3 | 17 | 23S | 29E | 592993 | 3574378* | 2294 | | 65 | |
| C 02808 | | CUB | ED | | 2 | 3 | 16 | 23S | 29E | 594909 | 3574501* | 2433 | 100 | | |
| C 02809 | | CUB | ED | | 2 | 3 | 16 | 23S | 29E | 594909 | 3574501* | 2433 | 100 | | |
| C 02716 | | CUB | ED | 4 | 4 | 4 | 16 | 23S | 29E | 595818 | 3574002* | 2565 | 400 | | |
| C 02706 | | C | ED | | | 4 | 18 | 23S | 29E | 592302 | 3574291* | 2581 | 17 | 10 | 7 |
| C 01217 S | | CUB | ED | 4 | 1 | 4 | 16 | 23S | 29E | 595413 | 3574403* | 2598 | 350 | | |
| C 02704 | | C | ED | | | 1 | 19 | 23S | 29E | 591531 | 3573493* | 2678 | 174 | | |
| C 02797 | | CUB | ED | | 2 | 3 | 22 | 23S | 29E | 596540 | 3572895* | 2693 | 200 | | |
| C 02705 | | C | ED | | | 2 | 17 | 23S | 29E | 593902 | 3575093* | 2815 | 68 | 28 | 40 |
| C 02717 | | CUB | ED | 4 | 2 | 4 | 16 | 23S | 29E | 595817 | 3574407* | 2852 | 400 | | |
| C 00571 | | CUB | ED | 1 | 3 | 3 | 30 | 23S | 29E | 591241 | 3570957* | 2985 | 90 | 38 | 52 |
| C 03058 EXPLORE | | CUB | ED | 4 | 1 | 1 | 16 | 23S | 29E | 594605 | 3575206* | 3007 | 150 | | |
| C 04490 POD1 | | CUB | ED | 1 | 4 | 4 | 24 | 23S | 28E | 590876 | 3572492 | 3049 | 37 | 25 | 12 |
| C 00571 CLW241602 | O | CUB | ED | 3 | 3 | 3 | 30 | 23S | 29E | 591241 | 3570757* | 3078 | 89 | 38 | 51 |
| C 02715 | | CUB | ED | 4 | 1 | 3 | 15 | 23S | 29E | 596221 | 3574411* | 3139 | 400 | | |
| C 02718 | | CUB | ED | 4 | 4 | 2 | 16 | 23S | 29E | 595816 | 3574812* | 3166 | 400 | | |
| C 00136 A | | CUB | ED | 4 | 4 | 4 | 25 | 23S | 28E | 591037 | 3570753* | 3259 | 100 | 60 | 40 |
| C 04556 POD3 | | CUB | ED | 4 | 3 | 1 | 24 | 23S | 28E | 590567 | 3573265 | 3493 | 40 | 36 | 4 |
| C 00136 S | | CUB | ED | 1 | 1 | 2 | 25 | 23S | 28E | 590426 | 3572167* | 3493 | 122 | 45 | 77 |
| C 00136 | | CUB | ED | 3 | 1 | 2 | 25 | 23S | 28E | 590426 | 3571967* | 3505 | 200 | 42 | 158 |
| C 00136 CLW194026 | O | CUB | ED | 3 | 1 | 2 | 25 | 23S | 28E | 590426 | 3571967* | 3505 | 200 | 52 | 148 |
| C 00136 CLW235233 | O | CUB | ED | 3 | 1 | 2 | 25 | 23S | 28E | 590426 | 3571967* | 3505 | 200 | 42 | 158 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C 04490 POD3 | CUB | ED | 4 | 1 | 2 | 24 | 23S | 28E | 590596 | 3573502 | 3539 | 37 | 33 | 4 |
| C 03001 EXPLORE | CUB | ED | 1 | 1 | 4 | 25 | 23S | 28E | 590430 | 3571355* | 3608 | 140 | | |
| C 01443 | C | ED | | 2 | 1 | 25 | 23S | 28E | 590123 | 3572064* | 3801 | 50 | 27 | 23 |
| C 04556 POD2 | CUB | ED | 4 | 3 | 1 | 24 | 23S | 28E | 589891 | 3573239 | 4140 | 40 | 36 | 4 |
| C 03965 POD4 | CUB | ED | | 1 | 4 | 24 | 23S | 28E | 589918 | 3573381 | 4149 | 40 | 31 | 9 |
| C 04584 POD3 | CUB | ED | 3 | 2 | 2 | 13 | 23S | 28E | 590887 | 3575129 | 4161 | 31 | | |
| C 00475 | CUB | ED | 2 | 1 | 3 | 25 | 23S | 28E | 589822 | 3571347* | 4200 | 144 | 38 | 106 |
| C 00500 | CUB | ED | 4 | 3 | 1 | 24 | 23S | 28E | 589811 | 3573176* | 4204 | 130 | | |
| C 00868 | CUB | ED | 4 | 3 | 1 | 24 | 23S | 28E | 589811 | 3573176* | 4204 | 190 | | |
| C 03965 POD5 | CUB | ED | 4 | 1 | 1 | 24 | 23S | 28E | 589864 | 3573534 | 4244 | 35 | 31 | 4 |
| C 03615 POD1 | CUB | ED | 1 | 3 | 2 | 06 | 24S | 29E | 591964 | 3568500 | 4253 | 60 | 36 | 24 |
| C 01215 | CUB | ED | 4 | 2 | 3 | 13 | 23S | 28E | 590210 | 3574397* | 4270 | 104 | 15 | 89 |
| C 02702 | C | ED | | | 2 | 13 | 23S | 28E | 590715 | 3575108* | 4274 | 38 | 20 | 18 |
| C 04326 POD14 | CUB | ED | 4 | 2 | 3 | 23 | 23S | 29E | 598191 | 3572765 | 4300 | 58 | 54 | 4 |
| C 04556 POD1 | CUB | ED | 4 | 3 | 1 | 24 | 23S | 28E | 589720 | 3573237 | 4306 | 40 | 36 | 4 |
| C 04326 POD16 | CUB | ED | 2 | 4 | 3 | 23 | 23S | 29E | 598209 | 3572664 | 4308 | 64 | 54 | 10 |
| C 02794 | CUB | ED | | 4 | 3 | 10 | 23S | 29E | 596518 | 3575731* | 4322 | 100 | | |
| C 02795 | CUB | ED | | 4 | 3 | 10 | 23S | 29E | 596518 | 3575731* | 4322 | 200 | | |
| C 03535 POD1 | C | ED | 4 | 3 | 3 | 25 | 23S | 28E | 589860 | 3570751 | 4335 | 210 | 25 | 185 |
| C 03146 | C | ED | 1 | 1 | 3 | 24 | 23S | 28E | 589613 | 3572970* | 4360 | 82 | 36 | 46 |
| C 01967 | C | ED | | 2 | 3 | 13 | 23S | 28E | 590111 | 3574498* | 4407 | 264 | 200 | 64 |
| C 03615 POD2 | CUB | ED | 4 | 2 | 4 | 06 | 24S | 29E | 592661 | 3568013 | 4445 | 60 | 26 | 34 |
| C 04490 POD2 | CUB | ED | 2 | 3 | 3 | 13 | 23S | 28E | 589899 | 3574259 | 4481 | 23 | 19 | 4 |
| C 01214 | CUB | ED | 1 | 2 | 3 | 13 | 23S | 28E | 590010 | 3574597* | 4544 | 70 | 20 | 50 |
| C 01217 | CUB | ED | 4 | 1 | 3 | 13 | 23S | 28E | 589789 | 3574371 | 4629 | 87 | 50 | 37 |
| C 04470 POD1 | CUB | ED | 3 | 1 | 3 | 07 | 23S | 29E | 591280 | 3576086 | 4632 | | | |
| C 04584 POD2 | CUB | ED | 4 | 2 | 1 | 13 | 23S | 28E | 590250 | 3575123 | 4642 | 34 | 19 | 15 |
| C 02804 | CUB | ED | | 2 | 1 | 08 | 23S | 29E | 593262 | 3576905* | 4673 | 100 | | |
| C 02805 | CUB | ED | | 2 | 1 | 08 | 23S | 29E | 593262 | 3576905* | 4673 | 100 | | |
| C 02806 | CUB | ED | | 1 | 1 | 09 | 23S | 29E | 594473 | 3576927* | 4682 | 100 | | |
| C 02807 | CUB | ED | | 1 | 1 | 09 | 23S | 29E | 594473 | 3576927* | 4682 | 100 | | |

Average Depth to Water: **38 feet**

Minimum Depth: **10 feet**

Maximum Depth: **200 feet**

**Record Count:** 63

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

**Easting (X):** 593918 **Northing (Y):** 3572278 **Radius:** 5000

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

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9/14/23 2:07 PM WATER COLUMN/ AVERAGE DEPTH TO WATER

# *New Mexico Office of the State Engineer*
# Point of Diversion Summary

| Well Tag | POD Number | (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64 | Q16 | Q4 | Sec | Tws | Rng | (NAD83 UTM in meters) X | Y |
|---|---|---|---|---|---|---|---|---|---|
| | C 03587 POD1 | 1 | 4 | 3 | 29 | 23S | 29E | 593338 | 3570754 |

| | | | | | |
|---|---|---|---|---|---|
| **Driller License:** | 1348 | **Driller Company:** | TAYLOR WATER WELL SERVICE | | |
| **Driller Name:** | TAYLOR, CLINTON E. (LD) | | | | |
| **Drill Start Date:** | 04/13/2013 | **Drill Finish Date:** | 04/14/2013 | **Plug Date:** | |
| **Log File Date:** | 05/07/2013 | **PCW Rcv Date:** | | **Source:** | Shallow |
| **Pump Type:** | | **Pipe Discharge Size:** | | **Estimated Yield:** | 1 GPM |
| **Casing Size:** | 4.00 | **Depth Well:** | 99 feet | **Depth Water:** | 44 feet |

| Water Bearing Stratifications: | Top | Bottom | Description |
|---|---|---|---|
| | 98 | 99 | Limestone/Dolomite/Chalk |

| Casing Perforations: | Top | Bottom |
|---|---|---|
| | 89 | 99 |

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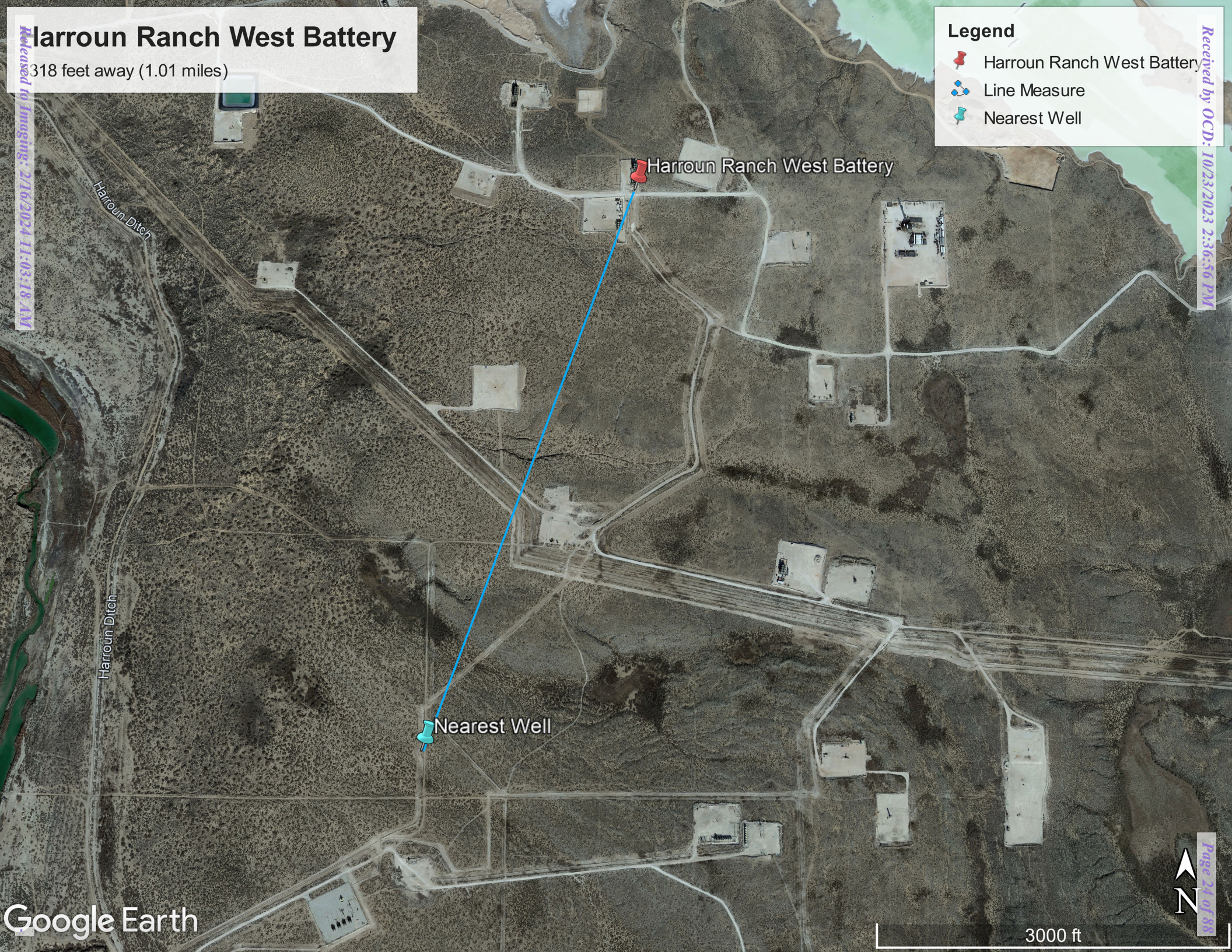


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U.S. Fish and Wildlife Service
National Wetlands Inventory

# 02 - Watercourse - 5689 feet away (1.08 mi)
# Harroun Ranch West Battery


September 14, 2023

**Wetlands**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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National Wetlands Inventory (NWI)
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U.S. Fish and Wildlife Service
National Wetlands Inventory

# 03 - Lakebed - 1543 miles away (0.29 mi)
# Harroun Ranch West Battery


September 14, 2023

**Wetlands**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

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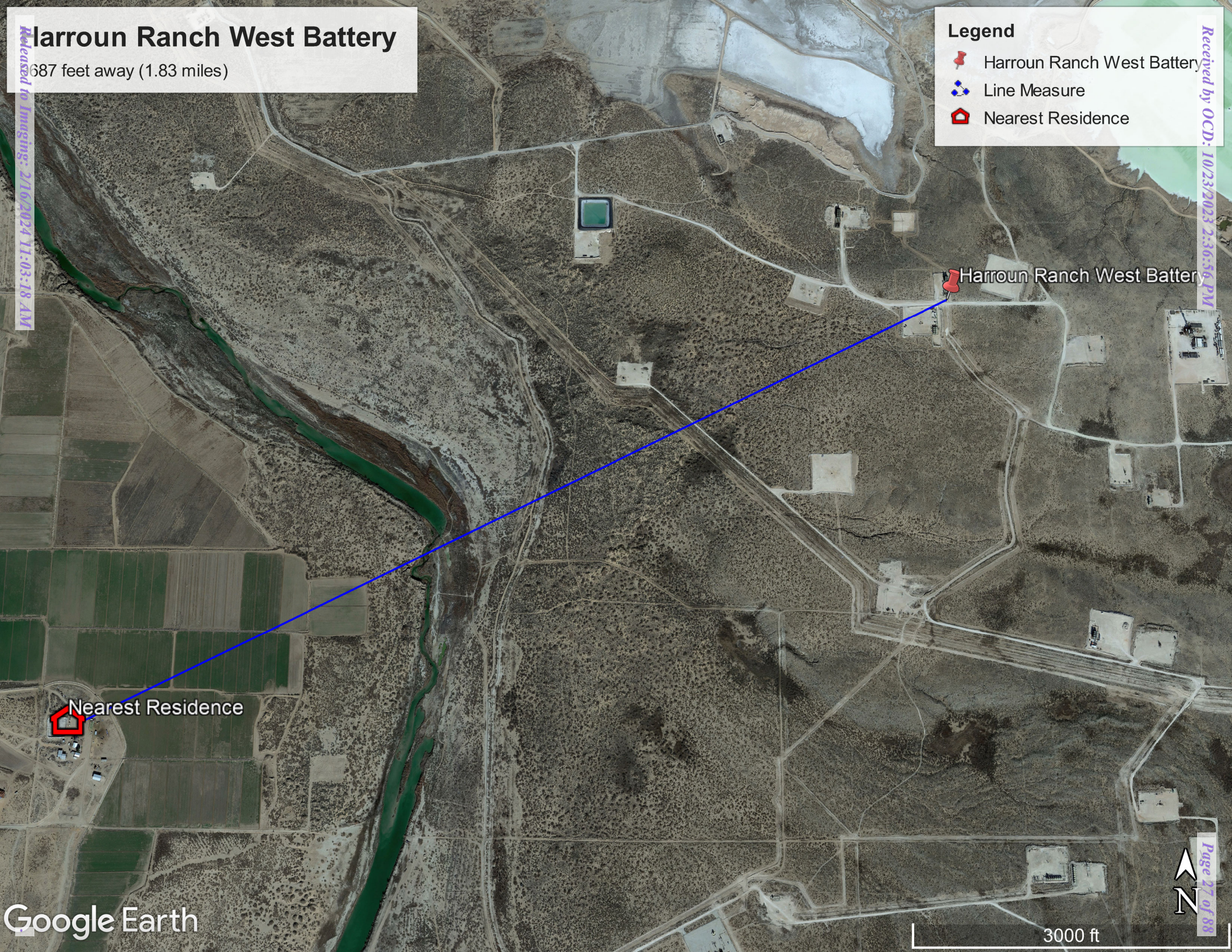


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*New Mexico Office of the State Engineer*

# Active & Inactive Points of Diversion

**(with Ownership Information)**

(acre ft per annum) (R=POD has been replaced and no longer serves this file, C=the file is closed) (quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) (NAD83 UTM in me

| WR File Nbr | Sub basin | Use | Diversion | Owner | County | POD Number | Well Tag | Code | Grant | Source | q 64 | q 16 | q 4 | Sec | Twn | Rng | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C 03377 | C | STK | 3 | B F & G FARMS | ED | C 03377 POD1 | | | | | 3 | 3 | 2 | 29 | 23S | 29E | 593596 | 3571587 |
| C 02613 | CUB | EXP | 0 | UNITED SALT CORPORATION | ED | C 02613 | | | | | 4 | 4 | 2 | 20 | 23S | 29E | 594203 | 3573176* |
| C 02721 | CUB | MON | 0 | JOHN WOZNICWICZ | ED | C 02721 | | | | | | 2 | 3 | 21 | 23S | 29E | 594915 | 3572879* |
| C 03057 | CUB | EXP | 0 | UNITED SALT CORPORATION | ED | C 03057 EXPLORE | | | | | 4 | 1 | 1 | 21 | 23S | 29E | 594605 | 3573586* |

**Record Count:** 4

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

**Easting (X):** 593918 **Northing (Y):** 3572278 **Radius:** 1610

**Sorted by:** Distance

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

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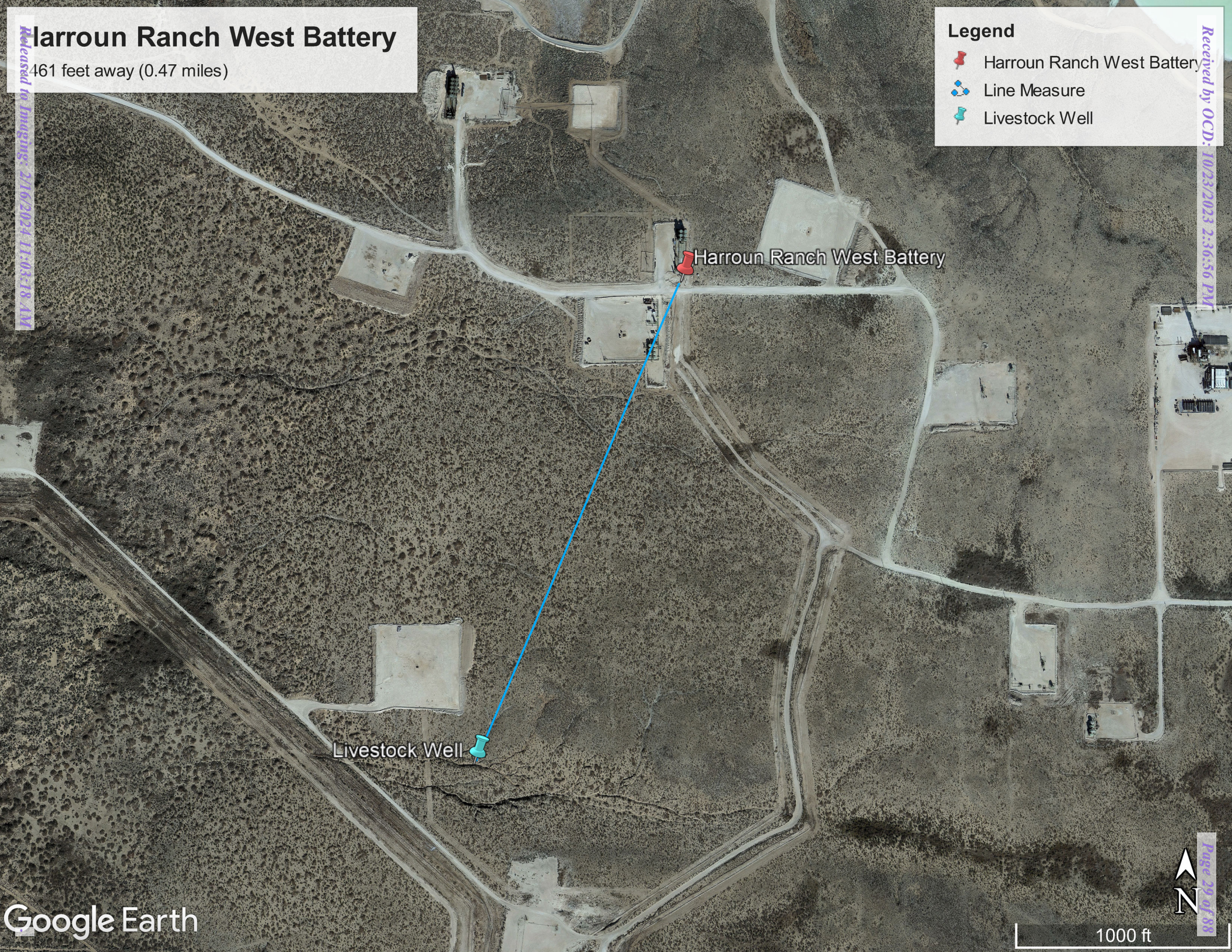
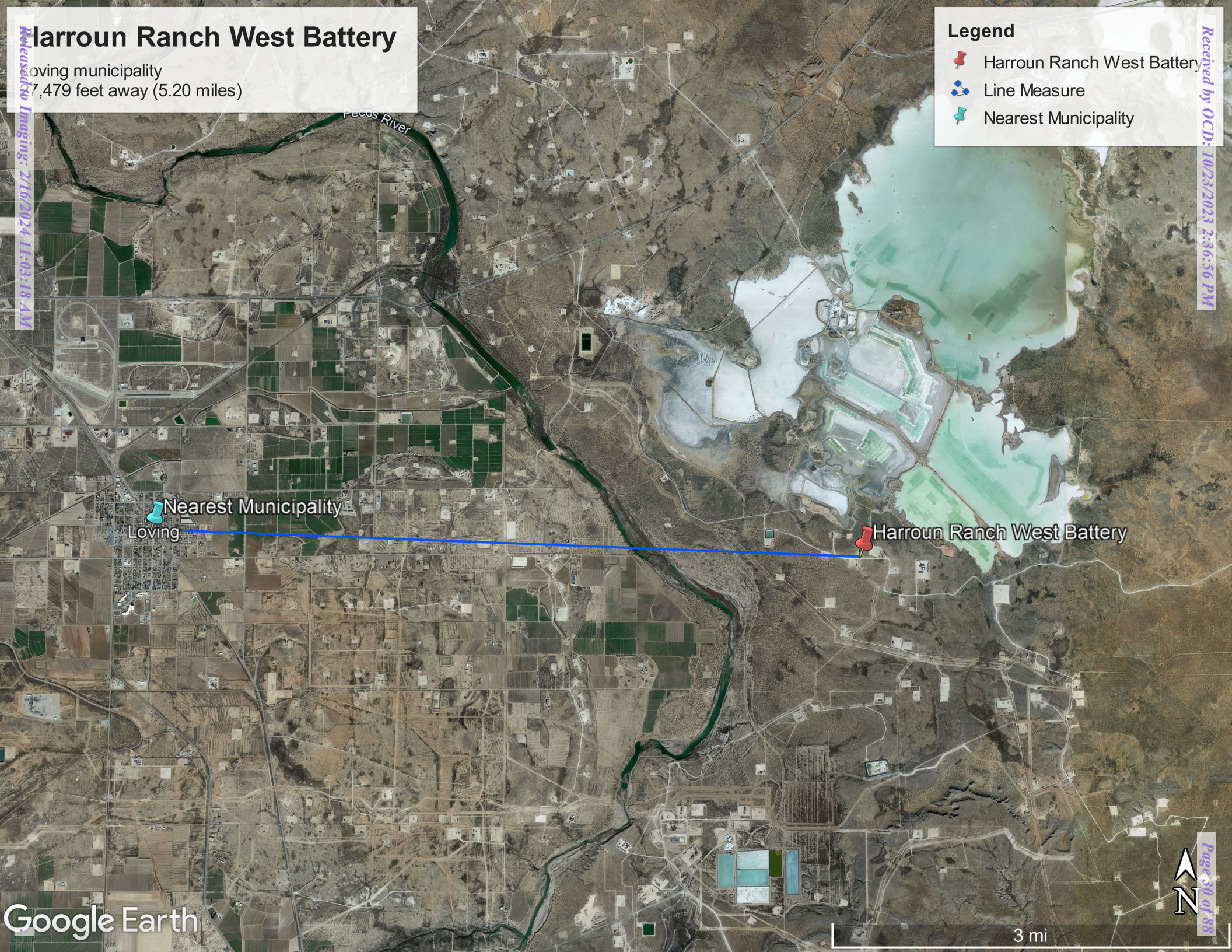
# Harroun Ranch West Battery

461 feet away (0.47 miles)

**Legend**

- Harroun Ranch West Battery
- Line Measure
- Livestock Well



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U.S. Fish and Wildlife Service
National Wetlands Inventory

# 07 - Wetland - 3152 feet away (0.6 miles)
# Harroun Ranch West Battery


September 14, 2023

**Wetlands**

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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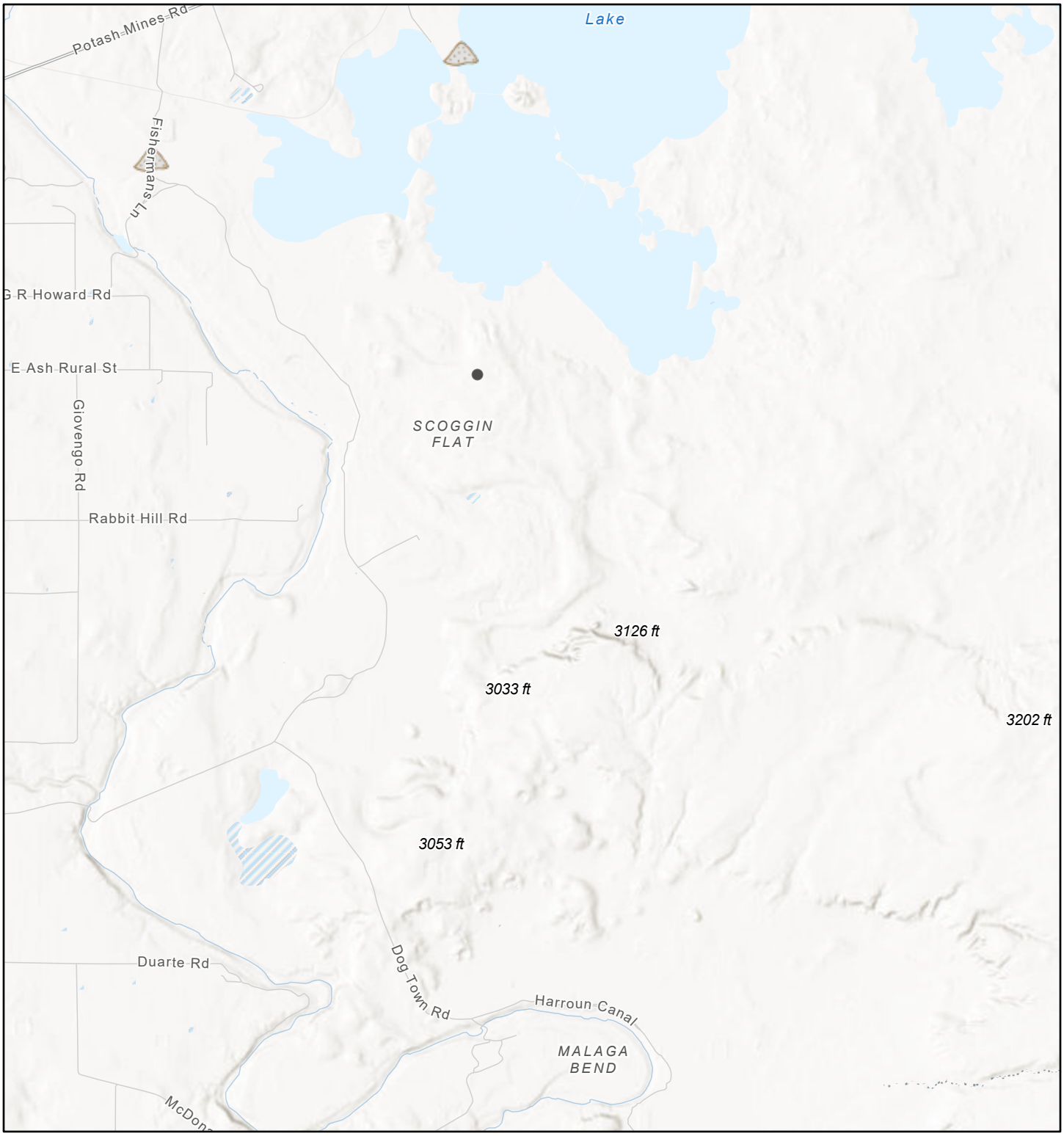
National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

# Harroun Ranch West Battery




9/14/2023, 3:27:23 PM

1:72,224

0 0.5 1 2 mi

0 0.75 1.5 3 km

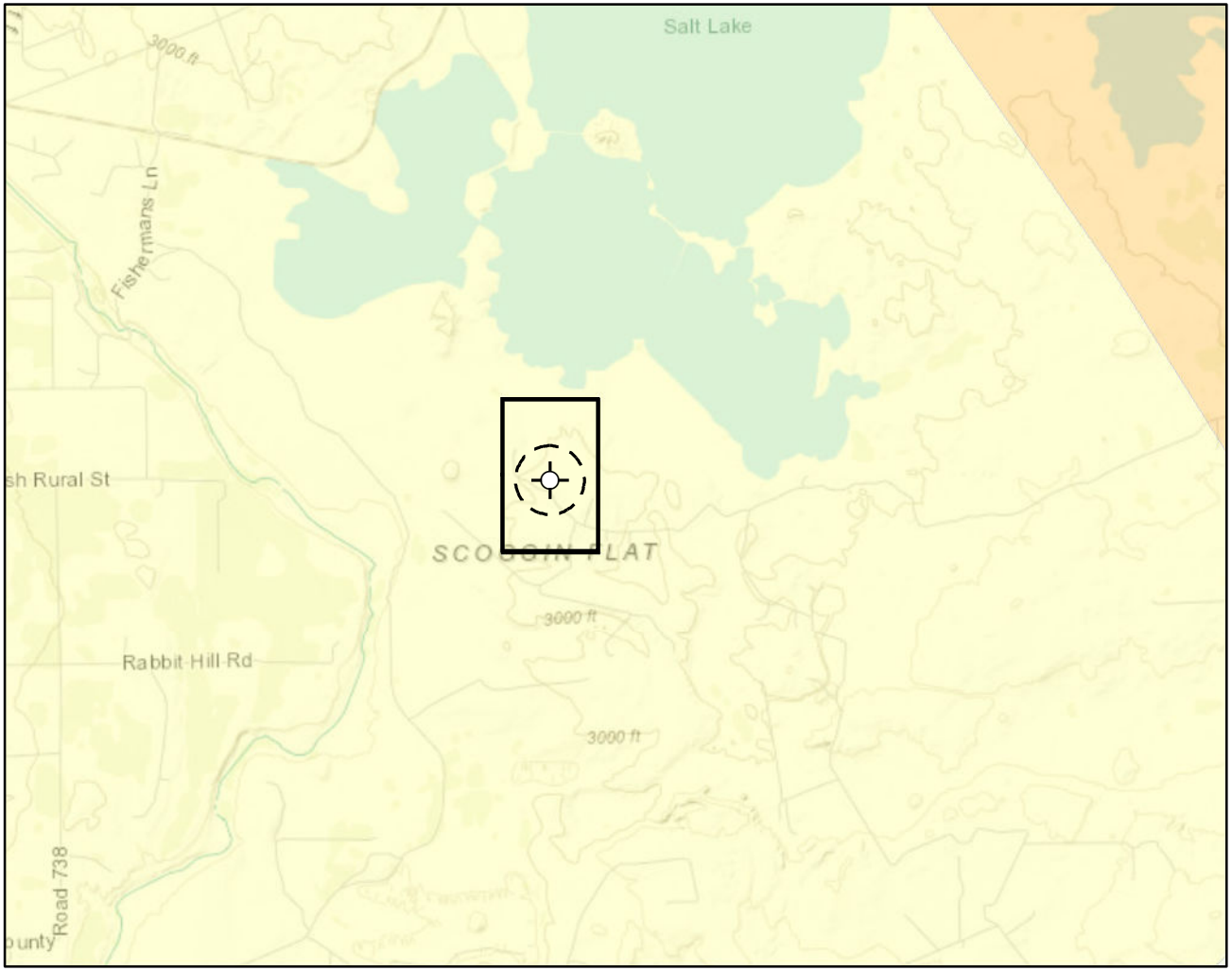
## Registered Mines

Salt

Esri, NASA, NGA, USGS, FEMA, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

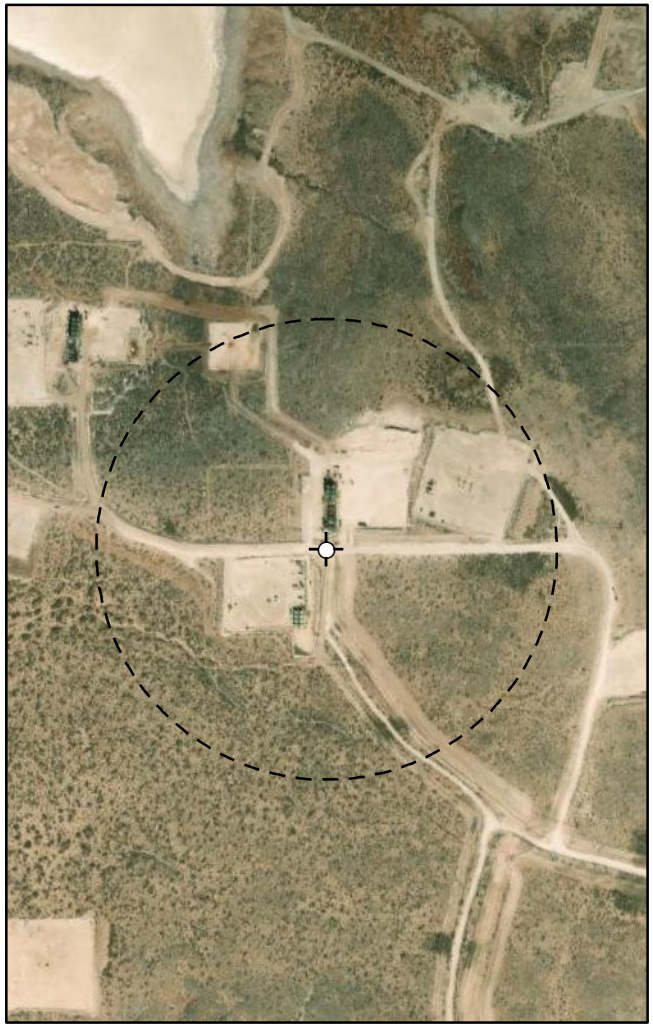
EMNRD MMD GIS Coordinator

New Energy, Minerals and Natural Resources Department (http://nm-emnrd.maps.arcgis.com/apps/webappviewer/index.html?id=1b5e577974664d689b47790897ca2795)




**Overview Map**

0 0.25 0.5 1 mi



**Detail Map**

0 150 300 600 ft

**Karst Potential**

- Critical
- High
- Medium
- Low

- Site Location
- Site Location 1000ft buffer

VERTEX

Map Center:
Lat/Long: 32.282854, -103.996813

NAD 1983 UTM Zone 13N
Date: Sep 22/23

N

**Karst Potential Map**
**Harroun Ranch West Battery**

FIGURE:
**1**

BTA

Geospatial data presented in this figure may be derived from external sources and Vertex does not assume any liability for inaccuracies. This figure is intended for reference use only and is not certified for legal, survey, or engineering purposes.

Note: Inset Map, Esri 2022; Overview Map: Esri World Topographic. Karst potential data sourced from Roswell Field Office, Bureau of Land Management, 2020 or United States Department of the Interior, Bureau of Land Management. (2018). Karst Potential.

VERSATILITY. EXPERTISE.

Document Path: G:\1-Projects_US PROJECTS\BTA Oil Producers LLC\2023\BTA - Harroun\Figure 1 Karst Potential Map (23E-05202)\D16982.mxd

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# National Flood Hazard Layer FIRMette

FEMA

104°0'28"W 32°17'15"N


0 250 500 1,000 1,500 2,000 Feet

1:6,000

103°59'51"W 32°16'45"N

Basemap Imagery Source: USGS National Map 2023

## Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

**SPECIAL FLOOD HAZARD AREAS**
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

**OTHER AREAS OF FLOOD HAZARD**
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

**OTHER AREAS**
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

**GENERAL STRUCTURES**
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

**OTHER FEATURES**
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

**MAP PANELS**
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 9/14/2023 at 5:33 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Eddy Area, New Mexico


September 14, 2023

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# Contents

# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

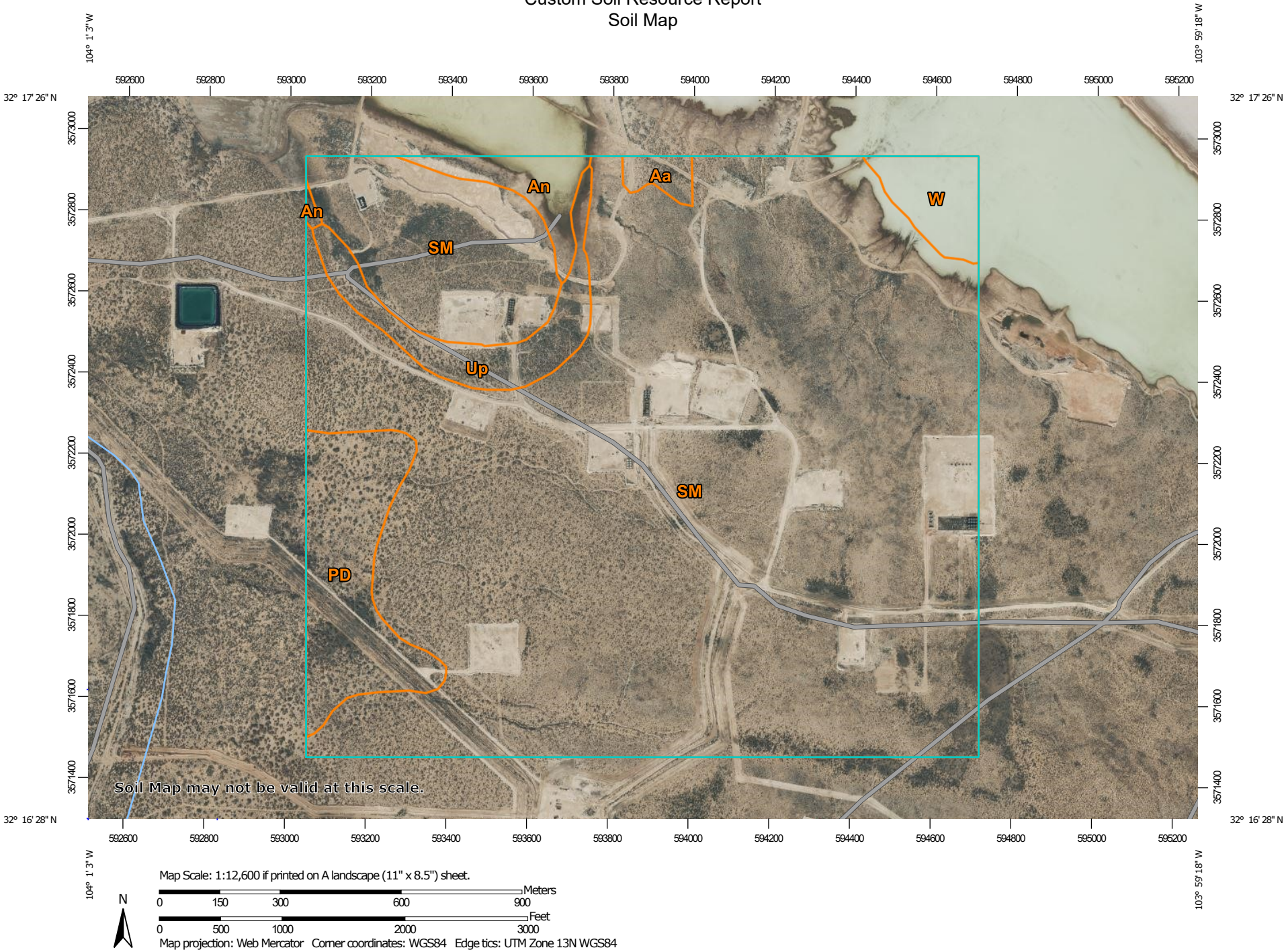
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map



## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 18, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 12, 2022—Dec 2, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| Aa | Anthony sandy loam, 0 to 1 percent slopes | 3.9 | 0.6% |
| An | Arno silty clay loam, 0 to 1 percent slopes | 11.3 | 1.8% |
| PD | Pajarito-Dune land complex, 0 to 3 percent slopes | 38.3 | 6.2% |
| SM | Simona-Bippus complex, 0 to 5 percent slopes | 526.1 | 85.8% |
| Up | Upton soils, 0 to 1 percent slopes | 21.0 | 3.4% |
| W | Water | 12.2 | 2.0% |
| **Totals for Area of Interest** | | **612.8** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# Eddy Area, New Mexico

## Aa—Anthony sandy loam, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* 1w3w
*Elevation:* 2,500 to 4,500 feet
*Mean annual precipitation:* 8 to 14 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 180 to 240 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Anthony and similar soils:* 99 percent
*Minor components:* 1 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Anthony

#### Setting

*Landform:* Flood plains, alluvial fans
*Landform position (three-dimensional):* Talf, rise
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Parent material:* Alluvium derived from sedimentary rock

#### Typical profile

*H1 - 0 to 6 inches:* sandy loam
*H2 - 6 to 60 inches:* sandy loam

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Maximum salinity:* Nonsaline to slightly saline (0.0 to 4.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* Moderate (about 7.2 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* A
*Ecological site:* R070BD004NM - Sandy
*Hydric soil rating:* No

### Minor Components

#### Anthony

*Percent of map unit:* 1 percent

*Ecological site:* R070BC036NM - Salt Flats
*Hydric soil rating:* No

## An—Arno silty clay loam, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* 1w3z
*Elevation:* 3,000 to 4,200 feet
*Mean annual precipitation:* 10 to 16 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 180 to 240 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Arno and similar soils:* 95 percent
*Minor components:* 5 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Arno

#### Setting

*Landform:* Flood plains, alluvial fans
*Landform position (three-dimensional):* Talf, rise
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Alluvium

#### Typical profile

*H1 - 0 to 9 inches:* silty clay loam
*H2 - 9 to 60 inches:* silty clay

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* RareNone
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Gypsum, maximum content:* 5 percent
*Maximum salinity:* Moderately saline to strongly saline (8.0 to 32.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* Low (about 5.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 4s
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* D

*Ecological site:* R070BC033NM - Salty Bottomland
*Hydric soil rating:* No

**Minor Components**

**Unnamed soils**
*Percent of map unit:* 4 percent
*Hydric soil rating:* No

**Pima variant**
*Percent of map unit:* 1 percent
*Landform:* Flood plains, alluvial flats, alluvial fans
*Landform position (three-dimensional):* Talf, rise
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear, convex
*Ecological site:* R070BC017NM - Bottomland
*Hydric soil rating:* Yes

## PD—Pajarito-Dune land complex, 0 to 3 percent slopes

**Map Unit Setting**
*National map unit symbol:* 1w55
*Elevation:* 3,000 to 5,000 feet
*Mean annual precipitation:* 10 to 15 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 190 to 220 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**
*Pajarito and similar soils:* 46 percent
*Dune land:* 45 percent
*Minor components:* 9 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Pajarito**

**Setting**
*Landform:* Plains, interdunes, dunes
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear, convex
*Parent material:* Mixed alluvium and/or eolian sands

**Typical profile**
*H1 - 0 to 9 inches:* fine sandy loam
*H2 - 9 to 36 inches:* fine sandy loam
*H3 - 36 to 72 inches:* fine sandy loam

**Properties and qualities**
*Slope:* 0 to 3 percent
*Depth to restrictive feature:* More than 80 inches

*Drainage class:* Well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High (2.00 to 6.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* Moderate (about 8.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2e
*Land capability classification (nonirrigated):* 7e
*Hydrologic Soil Group:* A
*Ecological site:* R070BD003NM - Loamy Sand
*Hydric soil rating:* No

## Description of Dune Land

**Setting**

*Landform:* Dune fields
*Landform position (two-dimensional):* Shoulder, backslope, footslope
*Landform position (three-dimensional):* Talf
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex, linear
*Parent material:* Mixed alluvium and/or eolian sands

**Typical profile**

*H1 - 0 to 6 inches:* sandy loam
*H2 - 6 to 60 inches:* sandy loam

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Ecological site:* R070BD003NM - Loamy Sand
*Hydric soil rating:* No

## Minor Components

**Rock outcrop**

*Percent of map unit:* 5 percent
*Hydric soil rating:* No

**Largo**

*Percent of map unit:* 4 percent
*Ecological site:* R070BC007NM - Loamy
*Hydric soil rating:* No

## SM—Simona-Bippus complex, 0 to 5 percent slopes

### Map Unit Setting

*National map unit symbol:* 1w5x
*Elevation:* 1,800 to 5,000 feet
*Mean annual precipitation:* 8 to 24 inches
*Mean annual air temperature:* 57 to 70 degrees F
*Frost-free period:* 180 to 230 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Simona and similar soils:* 55 percent
*Bippus and similar soils:* 30 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Simona

#### Setting

*Landform:* Plains, alluvial fans
*Landform position (three-dimensional):* Rise
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Parent material:* Mixed alluvium and/or eolian sands

#### Typical profile

*H1 - 0 to 19 inches:* gravelly fine sandy loam
*H2 - 19 to 23 inches:* indurated

#### Properties and qualities

*Slope:* 0 to 3 percent
*Depth to restrictive feature:* 7 to 20 inches to petrocalcic
*Drainage class:* Well drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 15 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* Very low (about 2.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 7e
*Hydrologic Soil Group:* D
*Ecological site:* R070BD002NM - Shallow Sandy

*Hydric soil rating:* No

### Description of Bippus

#### Setting

*Landform:* Flood plains, alluvial fans
*Landform position (three-dimensional):* Talf, rise
*Down-slope shape:* Convex, linear
*Across-slope shape:* Linear
*Parent material:* Mixed alluvium

#### Typical profile

*H1 - 0 to 37 inches:* silty clay loam
*H2 - 37 to 60 inches:* clay loam

#### Properties and qualities

*Slope:* 0 to 5 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.60 to 2.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* OccasionalNone
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 40 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* Moderate (about 8.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2e
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* B
*Ecological site:* R070BC017NM - Bottomland
*Hydric soil rating:* No

### Minor Components

#### Simona

*Percent of map unit:* 8 percent
*Ecological site:* R070BD002NM - Shallow Sandy
*Hydric soil rating:* No

#### Bippus

*Percent of map unit:* 7 percent
*Ecological site:* R070BC017NM - Bottomland
*Hydric soil rating:* No

## Up—Upton soils, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* 1w68
*Elevation:* 1,100 to 4,400 feet
*Mean annual precipitation:* 7 to 14 inches
*Mean annual air temperature:* 60 to 70 degrees F
*Frost-free period:* 200 to 240 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Upton and similar soils:* 98 percent
*Minor components:* 2 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Upton

#### Setting

*Landform:* Ridges, fans
*Landform position (three-dimensional):* Side slope, rise
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Parent material:* Residuum weathered from limestone

#### Typical profile

*H1 - 0 to 8 inches:* gravelly loam
*H2 - 8 to 18 inches:* gravelly loam
*H3 - 18 to 40 inches:* cemented
*H4 - 40 to 60 inches:* very gravelly loam

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 7 to 20 inches to petrocalcic
*Drainage class:* Well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately high (0.01 to 0.60 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 75 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* Very low (about 1.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 4s
*Land capability classification (nonirrigated):* 7s
*Hydrologic Soil Group:* D

*Ecological site:* R070BC025NM - Shallow
*Hydric soil rating:* No

**Minor Components**

**Upton**
*Percent of map unit:* 1 percent
*Ecological site:* R070BC025NM - Shallow
*Hydric soil rating:* No

**Atoka**
*Percent of map unit:* 1 percent
*Ecological site:* R070BC007NM - Loamy
*Hydric soil rating:* No

## W—Water

**Map Unit Composition**
*Water:* 100 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

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United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Eddy Area, New Mexico


September 14, 2023

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# Contents

# Soil Information for All Uses

## Ecological Sites

Individual soil map unit components can be correlated to a particular ecological site. The Ecological Site Assessment section includes ecological site descriptions, plant growth curves, state and transition models, and selected National Plants database information.

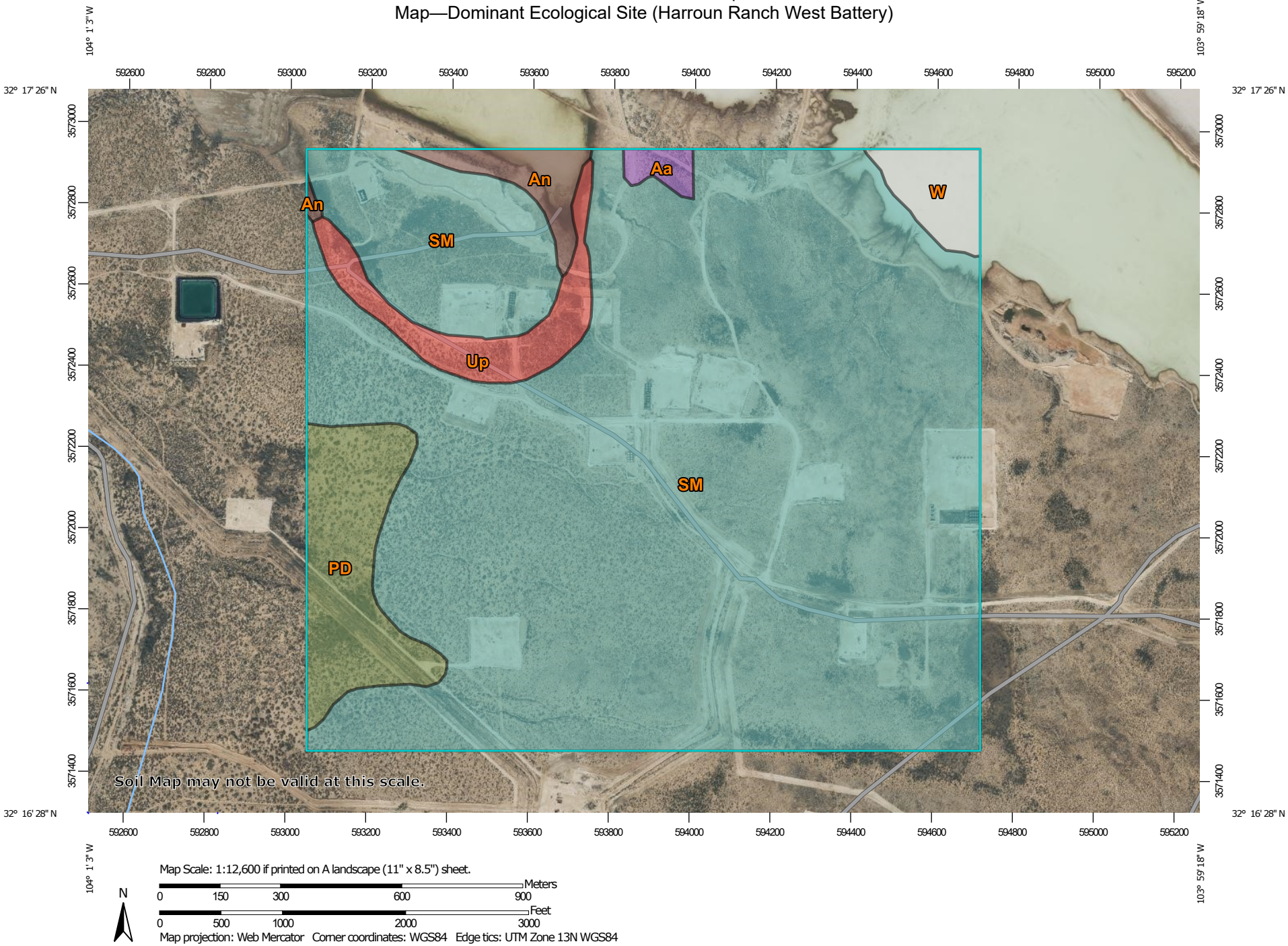
## All Ecological Sites — (Harroun Ranch West Battery)

An "ecological site" is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. For example, the hydrology of the site is influenced by development of the soil and plant community. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production.

An ecological site name provides a general description of a particular ecological site. For example, "Loamy Upland" is the name of a rangeland ecological site. An "ecological site ID" is the symbol assigned to a particular ecological site.

The map identifies the dominant ecological site for each map unit, aggregated by dominant condition. Other ecological sites may occur within each map unit. Each map unit typically consists of one or more components (soils and/or miscellaneous areas). Each soil component is associated with an ecological site. Miscellaneous areas, such as rock outcrop, sand dunes, and badlands, have little or no soil material and support little or no vegetation and therefore are not linked to an ecological site. The table below the map lists all of the ecological sites for each map unit component in your area of interest.

# Custom Soil Resource Report
## Map—Dominant Ecological Site (Harroun Ranch West Battery)



## MAP LEGEND

**Area of Interest (AOI)**

- Area of Interest (AOI)

**Soils**

**Soil Rating Polygons**

- R070BC025NM
- R070BC033NM
- R070BD002NM
- R070BD003NM
- R070BD004NM
- Not rated or not available

**Soil Rating Lines**

- R070BC025NM
- R070BC033NM
- R070BD002NM
- R070BD003NM
- R070BD004NM
- Not rated or not available

**Soil Rating Points**

- R070BC025NM
- R070BC033NM
- R070BD002NM
- R070BD003NM
- R070BD004NM
- Not rated or not available

**Water Features**

- Streams and Canals

**Transportation**

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**

- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eddy Area, New Mexico
Survey Area Data: Version 18, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 12, 2022—Dec 2, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Table—Ecological Sites by Map Unit Component (Harroun Ranch West Battery)

| Map unit symbol | Map unit name | Component name (percent) | Ecological site | Acres in AOI | Percent of AOI |
|---|---|---|---|---|---|
| Aa | Anthony sandy loam, 0 to 1 percent slopes | Anthony (99%) | R070BD004NM — Sandy | 3.9 | 0.6% |
| | | Anthony (1%) | R070BC036NM — Salt Flats | | |
| An | Arno silty clay loam, 0 to 1 percent slopes | Arno (95%) | R070BC033NM — Salty Bottomland | 11.3 | 1.8% |
| | | Unnamed soils (4%) | | | |
| | | Pima variant (1%) | R070BC017NM — Bottomland | | |
| PD | Pajarito-Dune land complex, 0 to 3 percent slopes | Pajarito (46%) | R070BD003NM — Loamy Sand | 38.3 | 6.2% |
| | | Dune land (45%) | R070BD003NM — Loamy Sand | | |
| | | Rock outcrop (5%) | | | |
| | | Largo (4%) | R070BC007NM — Loamy | | |
| SM | Simona-Bippus complex, 0 to 5 percent slopes | Simona (55%) | R070BD002NM — Shallow Sandy | 526.1 | 85.8% |
| | | Bippus (30%) | R070BC017NM — Bottomland | | |
| | | Simona (8%) | R070BD002NM — Shallow Sandy | | |
| | | Bippus (7%) | R070BC017NM — Bottomland | | |
| Up | Upton soils, 0 to 1 percent slopes | Upton (98%) | R070BC025NM — Shallow | 21.0 | 3.4% |
| | | Atoka (1%) | R070BC007NM — Loamy | | |
| | | Upton (1%) | R070BC025NM — Shallow | | |
| W | Water | Water (100%) | | 12.2 | 2.0% |
| **Totals for Area of Interest** | | | | **612.8** | **100.0%** |

# References

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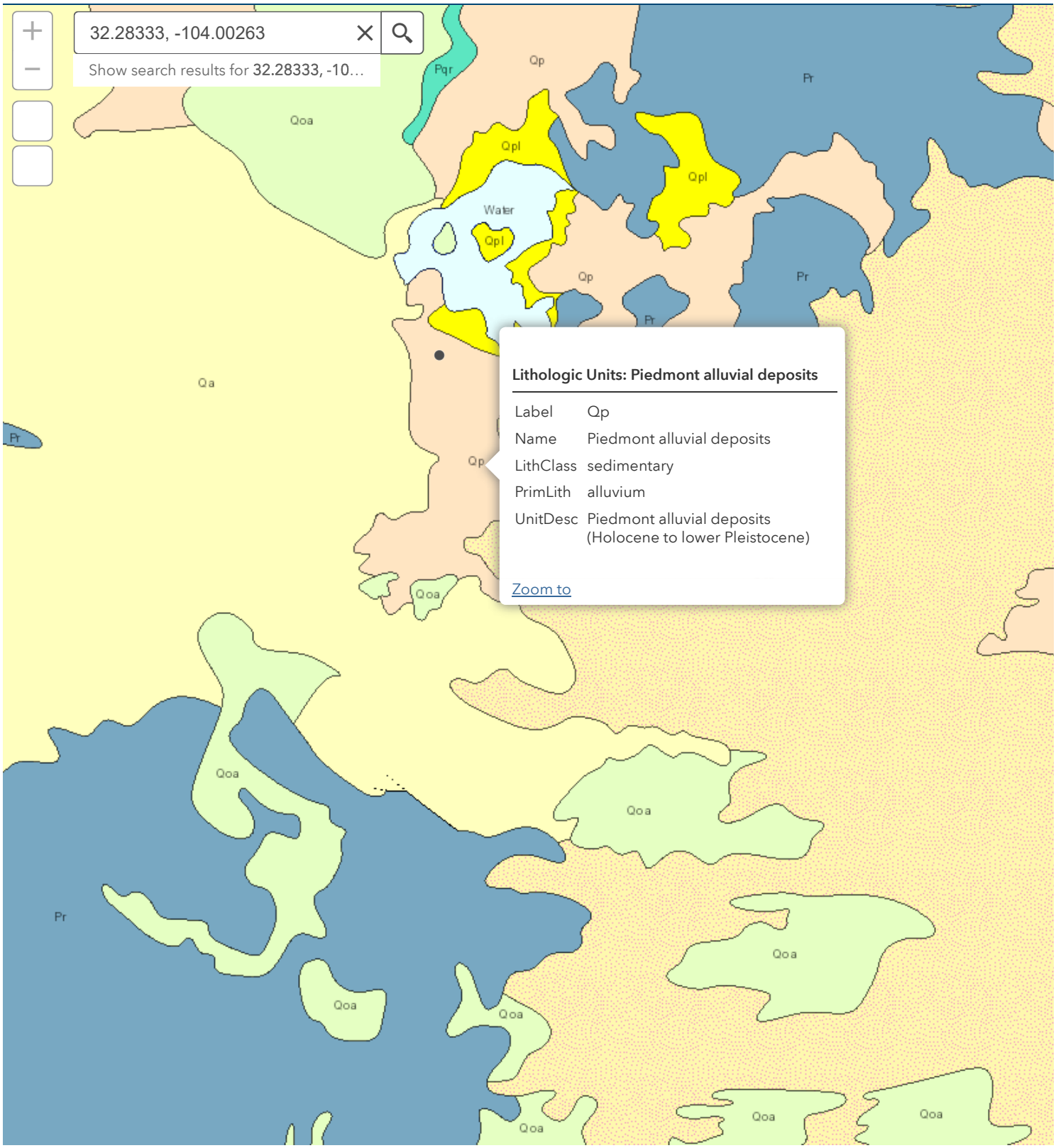
# NMBGMR Interactive Resources Map




2mi

-103.701 32.282 Degrees

App State

Click to restore the map extent and layers visibility where you left off.

# APPENDIX C – Daily Field Report

# Daily Site Visit Report

| | | | |
|---|---|---|---|
| Client: | BTA Oil Producers LLC | Inspection Date: | 9/29/2023 |
| Site Location Name: | Harroun Ranch West Battery | Report Run Date: | 10/4/2023 7:59 PM |
| Client Contact Name: | Kelton Baird | API #: | |
| Client Contact Phone #: | 432-312-2203 | | |
| Unique Project ID | | Project Owner: | |
| Project Reference # | | Project Manager: | |

## Summary of Times

| | |
|---|---|
| Arrived at Site | 9/29/2023 10:00 AM |
| Departed Site | 9/29/2023 11:00 AM |

# Daily Site Visit Report

## Site Sketch

Site Sketch

# Daily Site Visit Report

## Field Notes

**10:35** Arrived on site to conduct liner inspection after release.

**10:53** Inside and outside of the containment has been observed and there is no significant damage or breaches

## Next Steps & Recommendations

**1** Take site to closure

# Daily Site Visit Report

## Site Photos

| **Viewing Direction**: West | **Viewing Direction**: West |
|---|---|
|   |   |
| Inside of the south edge of containment | Inside north edge of containment |
| **Viewing Direction**: South | **Viewing Direction**: South |
|   |   |
| Middle of oil tanks north side | Inside of northwest edge of containment |

# Daily Site Visit Report

| **Viewing Direction**: East | **Viewing Direction**: East |
|---|---|
|  |  |
| Liner between northwest tanks | Liner between tanks |
| **Viewing Direction**: East | **Viewing Direction**: East |
|  |  |
| Liner between tanks | Liner between tanks |

# Daily Site Visit Report

| **Viewing Direction**: South | **Viewing Direction**: South |
|---|---|
|  |  |
| Inside of west edge of containment | Inside of southwest edge of containment |
| **Viewing Direction**: Northwest | **Viewing Direction**: North |
|  |  |
| Outside of south edge of containment | Inside the southeast edge of containment |

# Daily Site Visit Report

| **Viewing Direction**: Northwest | **Viewing Direction**: Northeast |
|---|---|
|  |  |
| Outside of southeast edge of containment | Outside of southwest edge of containment |
| **Viewing Direction**: Northeast | **Viewing Direction**: Northeast |
|  |  |
| Outside of west edge of containment | Outside of northwest edge of containment |

# Daily Site Visit Report

| **Viewing Direction**: Southeast | **Viewing Direction**: Southwest |
|---|---|
|  |  |
| Outside of north edge of containment | Outside of north east edge of containment |

| **Viewing Direction**: Southwest | **Viewing Direction**: West |
|---|---|
|  |  |
| Outside of east edge of containment | Liner between the heater treaters |

# Daily Site Visit Report

| **Viewing Direction**: West | **Viewing Direction**: North |
|---|---|
|  |  |
| Liner between the south separators | Inside the east edge of containment |
| **Viewing Direction**: West | **Viewing Direction**: West |
|  |  |
| Liner between the north separators | Liner south of the tanks |

# Daily Site Visit Report

| **Viewing Direction**: North | **Viewing Direction**: North |
| --- | --- |
|  |  |
| Between east edge of containment and tanks | Between north east edge of containment and oil tanks |

# Daily Site Visit Report

## Daily Site Visit Signature

**Inspector:** Chance Dixon

**Signature:** 

Signature

# APPENDIX D – Notifications

Gmail

**Dhugal Hanton <vertexresourcegroupusa@gmail.com>**

# 48-Hour Notification - Harroun Ranch West Battery

4 messages

**Dhugal Hanton** <vertexresourcegroupusa@gmail.com> Thu, Sep 21, 2023 at 3:15 PM
To: "Enviro, OCD, EMNRD" <OCD.Enviro@emnrd.nm.gov>
Cc: KBeaird@btaoil.com
Bcc: AMohle@vertex.ca

All,

Please accept this email as 48-hour notification that Vertex Resource Services has scheduled a liner inspection to be conducted for the following release.

nAPP2325425842

This work will be done on behalf of BTA Oil Producers, LLC.

On Wednesday, September 27, 2023, at approximately 8:00 a.m., Angela Mohle will be on site to conduct a liner inspection. She can be reached at 575-361-2689. If you need directions to the site, please do not hesitate to contact her. If you have any questions or concerns regarding this notification, please call me at 575-988-1472.

Thank you,

**Chance Dixon** B.Sc.
Project Manager

Vertex Resource Services Inc.
3101 Boyd Drive,
Carlsbad, NM 88220

**C 575.988.1472**

**Rodgers, Scott, EMNRD** <Scott.Rodgers@emnrd.nm.gov> Thu, Sep 21, 2023 at 4:15 PM
To: Dhugal Hanton <vertexresourcegroupusa@gmail.com>, "Hamlet, Robert, EMNRD" <Robert.Hamlet@emnrd.nm.gov>, "Bratcher, Michael, EMNRD" <mike.bratcher@emnrd.nm.gov>
Cc: "KBeaird@btaoil.com" <KBeaird@btaoil.com>

The OCD has received your notification. Include a copy of this and all notifications in the remedial and/or closure reports to ensure the notifications are documented in the project file.

**Scott Rodgers** ● Environmental Specialist

Environmental Bureau

EMNRD - Oil Conservation Division

8801 Horizon Blvd. NE, Suite 260 | Albuquerque, NM 87113

505.469.1830 | scott.rodgers@emnrd.nm.gov

http://www.emnrd.nm.gov/ocd

**From:** Dhugal Hanton <vertexresourcegroupusa@gmail.com>
**Sent:** Thursday, September 21, 2023 3:16 PM
**To:** Enviro, OCD, EMNRD <OCD.Enviro@emnrd.nm.gov>
**Cc:** KBeaird@btaoil.com
**Subject:** [EXTERNAL] 48-Hour Notification - Harroun Ranch West Battery

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

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Project Manager

Vertex Resource Services Inc.
3101 Boyd Drive,
Carlsbad, NM 88220

**C 575.988.1472**

**Dhugal Hanton** <vertexresourcegroupusa@gmail.com> Mon, Sep 25, 2023 at 11:42 AM
To: "Rodgers, Scott, EMNRD" <Scott.Rodgers@emnrd.nm.gov>

Good morning,

Vertex respectfully requests that this event be rescheduled to Thursday, September 28, 2023, at 8:00 a.m. due to a scheduling error.

Please let me know if there are any questions or concerns with this request.

Thank you,

**Chance Dixon** B.Sc.
Project Manager

Vertex Resource Services Inc.
3101 Boyd Drive,
Carlsbad, NM 88220

**C 575.988.1472**

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>
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>
> Environmental Bureau
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> EMNRD - Oil Conservation Division
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> 8801 Horizon Blvd. NE, Suite 260 | Albuquerque, NM 87113
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**2 attachments**


**image001.jpg**
5K


**image001.jpg**
5K

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Carlsbad, NM 88220

**C 575.988.1472**

**District I**
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
**District II**
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
**District III**
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
**District IV**
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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



## CONDITIONS

| | |
|---|---|
| Operator:<br>BTA OIL PRODUCERS, LLC<br>104 S Pecos<br>Midland, TX 79701 | OGRID:<br>260297 |
| | Action Number:<br>278483 |
| | Action Type:<br>[C-141] Release Corrective Action (C-141) |

**CONDITIONS**

| Created By | Condition | Condition Date |
|---|---|---|
| amaxwell | None | 2/16/2024 |