



McNabb Partners, LLC
Hobbs • Carlsbad • Midland
575.397.0050
www.mcnabbpartnersllc.com

September 5, 2025

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

RE: Reclamation and Remediation Workplan (revised)
Casa State #001
API: 30-025-27944
Incident ID: nPRS0522035374
SLO Lease #/Lessee: E0-8712-0001; CQ Acquisition Partners I L.P. - Active
Lat/Long: 32.8077087, -103.5592422
Unit/Township/Range/Section: H-28-17S-34E

On behalf of MorningStar Operating, LLC, McNabb Partners, LLC prepared the following remediation and reclamation plan for the above location.

1. The well site is located approximately 15 miles southwest of Lovington, New Mexico, in an area of oil and gas activity, and cattle grazing. No surface water is present in the area, and vegetation is moderately dense. The site can be accessed from the intersection of NM-238 and NM County Road 125 (Mescalero Road) by traveling west on NM County Road 125 for 1.9 miles. Travel south for 1.3 miles. Turn west for 0.9 miles and proceed south to the well site location. There are no access issues. Plat 1 shows the topographic site location and Plat 2 shows the complete site map.
2. Site conditions and history:
 - a. Site Use: An approximately 100,000 sq ft caliche pad and a legacy reserve pit area of an approximately 65,000 sq ft used for oil and gas production on 2 wells both operated by MorningStar Operating, LLC: an active injection well North Vacuum ABO West Unit #017 (API: 30-025-23835) and plugged oil well Casa State #001 (API: 30-025-27944).
 - b. The Casa State #001 well has been plugged by the plug-and-abandonment notice of intent approved on 01/21/2025. The facility is being decommissioned, and the pumpjack has already been removed from the location, and a dry hole marker has been installed. Prior to the start of the reclamation and remediation activities, all remaining equipment such as 2 storage tanks, a heater treater and all associated flowlines will be removed from the area due for the reclamation.
 - c. MorningStar Operating, LLC is listed as the current operator of the well site since 09/11/2024.
 - d. The active lease E0-8712-0001 was issued on 12/21/1954 and has been extended since then.

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- e. There are no unresolved compliance issues on the NMOCD website, and one open incident nPRS0522035374 – a produced water release has been reported with the associated well API.

3. Site assessment:

- a. Soil Type: The USDA Natural Resources Conservation Service (NRCS) soil survey¹ describes near surface lithology at this site as:

The entire well pad and the legacy reserve pit consist of Kimbrough gravelly loam (62.5%), Kimbrough-Lea complex (8.4%), Stegall and Slaughter soils (29.2%),:

Description of KO—Kimbrough gravelly loam, slope: 0 to 3 %

- A - 0 to 3 inches: gravelly loam
- Bt - 3 to 10 inches: loam
- Bkkm1 - 10 to 16 inches: cemented material
- Bkkm2 - 16 to 80 inches: cemented material

Description of KU—Kimbrough-Lea complex, slope: 0 to 3 %

- A - 0 to 3 inches: loam
- Bt - 3 to 10 inches: loam
- Bkk - 18 to 26 inches: gravelly fine sandy loam
- Bkkm - 26 to 80 inches: cemented material

Description of SS—Stegall and Slaughter soils, slope: 0 to 1 %

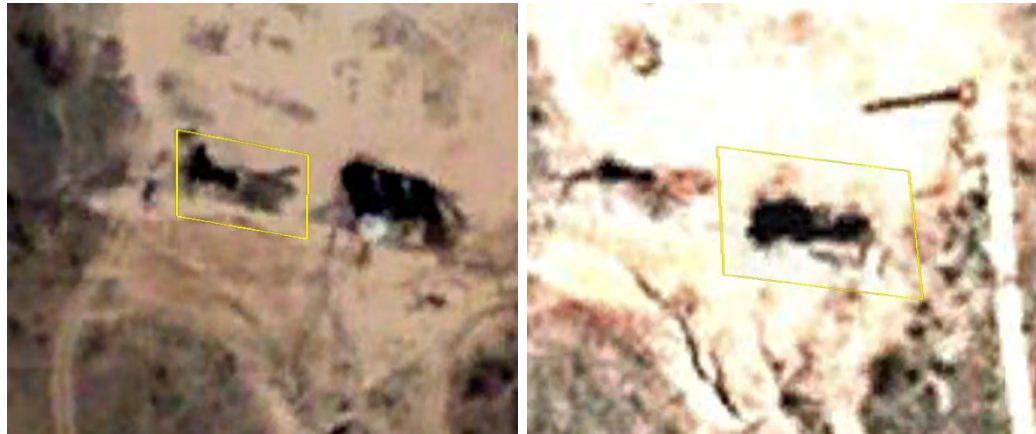
- A - 0 to 9 inches: loam
- Bt - 9 to 28 inches: clay loam
- Bmk - 28 to 38 inches: cemented material
- BCK - 38 to 60 inches: variable

- b. During the initial site field visit, McNabb Partners conducted an EM (electromagnetic) survey throughout the entire production area and all areas of interest. EM Survey identified elevated high chloride concentrations exceeding 600 mg/kg chloride concentration within the upper 4 feet, mostly present around the storage tank battery area, and area of interest south off the battery. The EM survey did not identify any chloride concentrations exceeding remediation criteria below 4 feet.
- c. During the initial site field visit, there were no hydrocarbon impacts observed at any point. Washouts were noted south of the storage tank battery.
- d. From the aerial review with Google Earth Imagery, 2 areas of interest related to suspect hydrocarbon staining were identified. An area of interest around the wellhead, first observed in the 02/02/2003 imagery, and an area of interest within the tank battery containment, first observed in the 06/30/2005 imagery, shown below, respectively:

¹ <https://websoilurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>



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The suspected hydrocarbon impacts around the wellhead will be addressed accordingly during the reclamation and remediation activities, if any contaminants are found. The area of interest within the tank battery containment is already included in the current remediation extent, as elevated chloride concentrations were identified during initial field site assessment. This area is proposed to be excavated to a depth of 4 feet, or until closure criteria are met.

4. Site Characterization and Groundwater Determination:

- a. Based on a review of the USGS and NMOSE groundwater databases, there are several known groundwater sources within ½-mile of the Site with data suggesting depth to water below 100 feet below ground surface (ft bgs). 2 USGS wells (324825103332601 and 324835103333701) have recorded groundwater levels at 148 and 154 ft bgs, with final measurements taken in 1976 and 1980. Both well logs are attached to this report.
- b. The site is located more than 200 feet from a lakebed, sinkhole, or playa lake, and over 300 feet from any occupied residence, school, hospital, institution, church, or wetland. The site is not within a 100-year floodplain or above a subsurface mine. The site is located in a Low Karst Potential area. The site characterization is attached to this report.
- c. The fresh water well OSE# L-03398 (NMED Water System # NM3591308) used for industrial operations (refining and water flooding) by Mosaic Potash Carlsbad, Inc. is partially located within a 1000 ft of the proposed remediation and reclamation extent of the site. The well is located approximately 850 ft northwest of the northwest edge of the proposed reclamation & remediation area, and approximately 1140 ft northeast of the southwest edge of the proposed reclamation & remediation area.

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d. All areas of interest will be remediated and reclaimed to these concentrations:

DTW > 100 ft bgs; Fresh Water well partially within a 1000 ft radius	Chloride (mg/kg)	GRO+DRO (mg/kg)	TPH Ext. (mg/kg)	Benzene (mg/kg)	BTEX (mg/kg)
0 - 4 feet	600	--	100	10	50
≥ 4 feet (within 1000 ft radius of a fresh water well)	600	--	100	10	50
≥ 4 feet (outside of 1000 ft radius of a fresh water well)	20,000	1,000	2,500	10	50

5. Incident Review (nPRS0522035374)

- According to NMOCD, there has been one incident reported at this well site which occurred under Ray Westall operating. The release occurred on or before 08/08/2005. As a result of a produced water tank overflow, 7 bbls of produced water were released, spreading along a narrow 100-foot-long path and forming a 30-by-30 ft puddle.
- No C-141 documentation was provided at the time, and no information about any remediation activities or delineation samples is available. The results of EM survey assess soil salinity through the entire production area, and in all areas of concern related to this release. All areas of concern related to the release will be addressed in accordance with NMAC 19.15.29.12 and 19.15.29.13. All impacted areas identified with Google Earth aerial imagery and EM survey will be completely delineated and remediated to the applicable closure criteria concentrations.
- Following the delineation of impacts, all impacted material will be excavated and hauled off for a proper disposal to at an approved facility. After the completion of all remediation and reclamation activities, a closure report will be submitted for this incident to the NMOCD web portal.

6. Cultural Properties Protection Rule and Biological Compliance:

- During the reclamation and remediation activities presented in this plan, McNabb Partners does not intend to disrupt any surfaces previously undisturbed by oil & gas production. All sampling activities will be limited to the areas of production activities. In a case where reclamation and remediation require advancing into the areas outside of the pad and reserve pit boundaries, all sampling activities will be stopped until an archeological survey and ARMS inspection are completed by a qualified archeologist. NMSLO will be notified of the results of archeological findings.
- After a desktop review of U.S. Fish and Wildlife Services (Information for Planning and Consultation), Biota Information System of New Mexico Map, and BLM wildlife maps, there are no endangered species habitats within the vicinity of the site. The nearest endangered species habitats are located further than 5 miles away from the well site pad. Please refer to the maps attached to this report.

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7. Reclamation and remediation activities:

- a. Approximately 16,700 sq ft of the impacted soil surface be remediated and a total of 63,000 sq ft of the site pad surface will be reclaimed to the natural conditions. Approximately, 2,721 cubic yards of impacted soil will be hauled off for disposal at an approved facility.
 - b. We propose excavating impacted areas on the pad based on the soil salinity data provided with EM Survey. Any soil with chloride concentrations above 600 mg/kg detected at the surface will be excavated to a depth of 1.5 feet below ground surface. For chloride contamination found deeper within 4 feet of the surface, excavation will extend to 4 feet below ground surface outside the sensitive 1000-foot radius around the well. Within the 1000-foot radius, excavation will continue beyond 4 feet until chloride, TPH and BTEX concentrations are below the most stringent criteria.
 - c. If any additional impacted material is identified during delineation activities, it will be remediated and reclaimed in accordance with NMAC 19.15.29.12 and 19.15.29.13.
 - d. Please refer to the Plat 3 through Plat 7 for the proposed excavation depths and EM Survey visual representation.
 - e. Following the completion of the excavation, confirmation samples will be collected from the base and side walls of the excavation using a five (5) point composite method. All confirmation samples will be sent to a certified laboratory for testing BTEX, TPH and chloride concentrations. If any of the confirmation samples indicate concentrations that exceed the regulatory limits in Table I (NMAC 19.15.23.12), the areas represented by those samples will be further excavated until the concentrations are below the NMOCD Closure Criteria.
 - f. All clean surface caliche will be stockpiled on location and used as a backfill material. Once the caliche is removed from the surface, all areas due to reclamation will be cross-ripped to a maximum depth where cemented material would not be brought to surface, at approximately 10 to 15 inches bgs.
 - g. Areas subject to remediation on pad and in legacy reserve pit areas will be backfilled with clean, non-impacted soil, contoured to match surrounding topography. Backfill material will include unimpacted surface caliche of the native lithology. Any caliche sourced on-site for backfilling will be sampled and analyzed for TPH, BTEX, and chloride, with each composite sample representing no more than 100 cubic yards of material.
 - h. After compaction and surface ripping, the soil cover of 6 to 12 inches of clean, locally sourced, non-impacted topsoil will be placed over remediated and reclaimed areas where needed. Topsoil will be placed to match the surface level of surrounding landscape, imitating the original landform as much as possible.
8. The lease road between Casa State #001 and Casa State #002 sites running through the playa will be reclaimed accordingly. Excess non-native caliche on the lease road will be gently removed to the extent possible without excavating native soils in a playa. The surface will be carefully roughened to a maximum depth of 2–4 inches to improve infiltration and seedbed conditions. Disturbed areas will be reseeded with a native seed mix appropriate for the playa environment to promote vegetation establishment and long-term

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stabilization. The two-track road on the east of the location will be cross-ripped and seeded with a native seed mixture to NMSLO Coarse Mixture. Please refer to the plat 9 for the proposed area of a lease road restoration.

9. Site specific soil contouring: This site is generally flat and limited contouring required to match surrounding topography.
10. Seed Mixture: Certified weed-free NMSLO Coarse Mixture to provide site with more desirable native vegetation.
11. Timing of seeding: within 2 weeks following completion of final seedbed preparation (optimal time to seed is prior to or early in monsoon season).
12. Seed application technique: Broadcast seeding followed by dragging or chaining.
13. Erosion Control: Eroded areas will be filled with native topsoil and regraded to match surrounding contours, promoting drainage toward the natural playa to the south. Disturbed areas, including backfilled zones, will be roughened perpendicular to water flow to slow runoff. A shallow swale will be constructed along contours through the repaired areas to redirect stormwater toward the playa. Small rock check structures will be placed within swales to reduce water velocity and prevent further erosion. Please refer to the Plat 8 for proposed erosion control measures.
14. Mulching, as needed.
15. The reclaimed surface will be bermed to separate an area of the restoration from an active production area, and to discourage vehicles from entering the reclaimed area. The traffic control berm will be seeded with a NMSLO Coarse Mixture.
16. Photo documentation of remediation and reclamation activities.
17. Monitoring plan
 - a. The site will be monitored bi-annually for vegetation growth to ensure that reclamation and reseeding activities were sufficient and absence of invasive weeds.
 - b. The site will be evaluated for soil stabilization, erosion, and invasive and noxious species.
 - c. Noxious and invasive weeds will be identified and treated or mechanically removed.
 - d. Inspections will occur annually until revegetation is consistent with local natural vegetation density.
 - e. When revegetation is completed, NMSLO will be notified for final inspection.
18. Implementation schedule:
 - a. Upon approval of remediation/reclamation workplan, the project will be completed in 90 days.

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Please contact me with any questions at 917-497-6890.

Sincerely,



Dimitry Nikanorov
Project Manager
McNabb Partners
(917) 497-6890



Copy: NMSLO Environmental Compliance Office
MorningStar Operating, LLC

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Figure 1. View of the location.



Figure 2. View of the location.



Figure 3. View of the location.



Figure 4. View of the location.

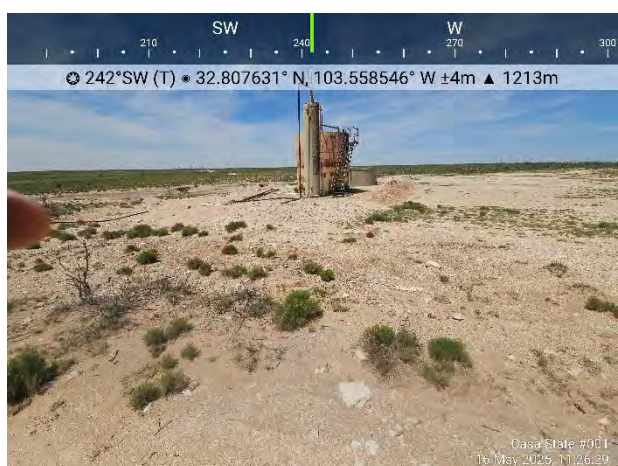


Figure 5. View of the location.

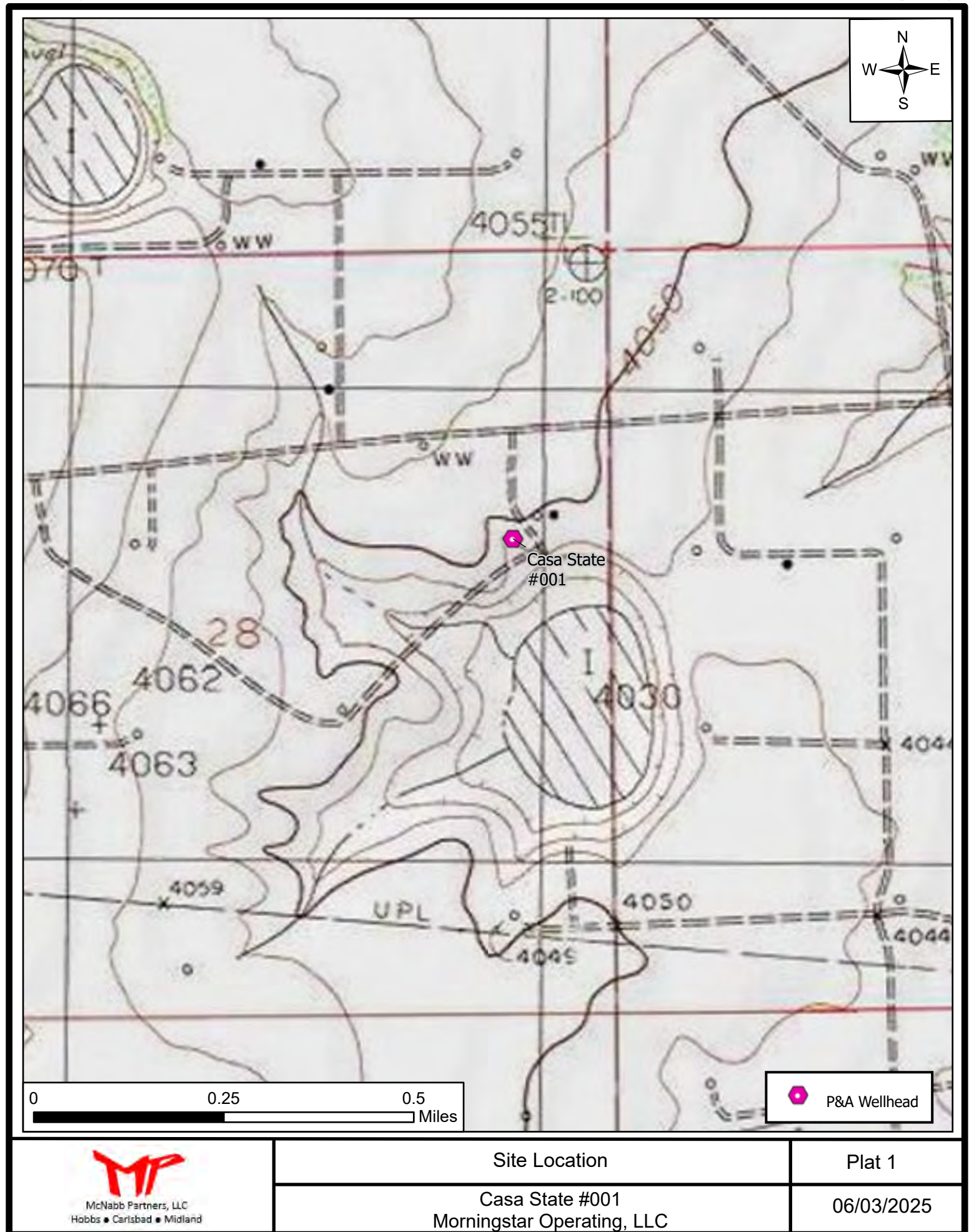


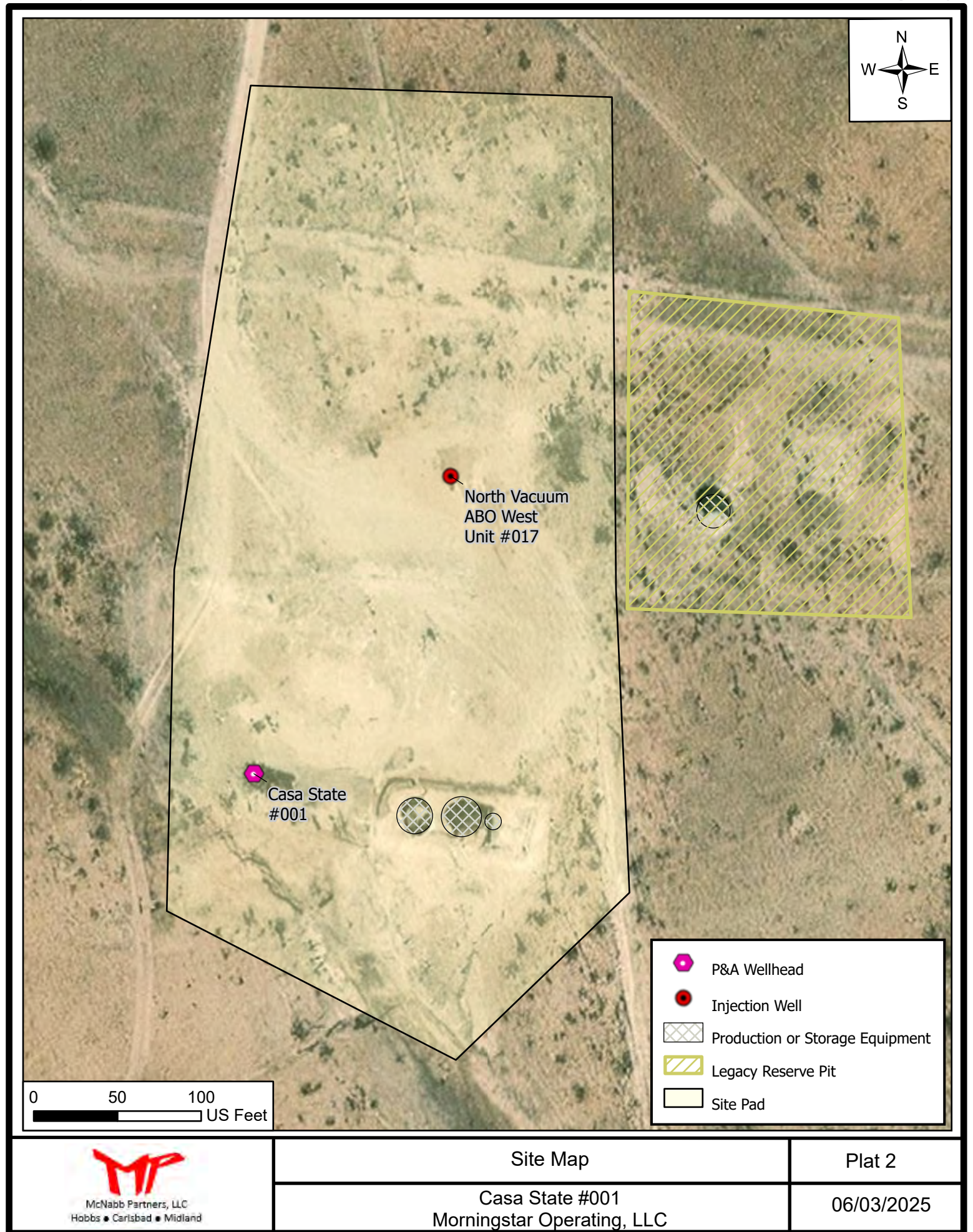
Figure 6. View of the location.

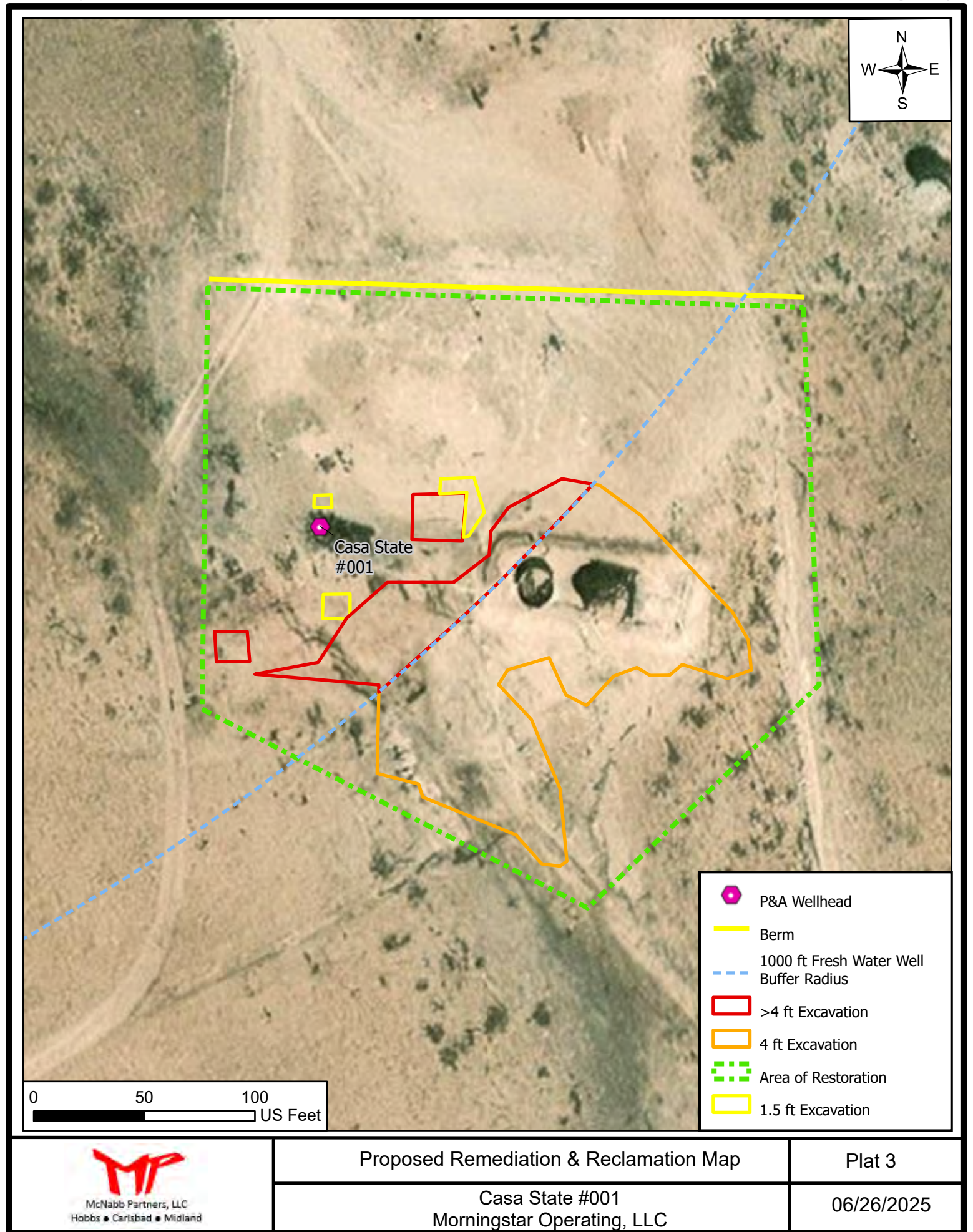
Plates

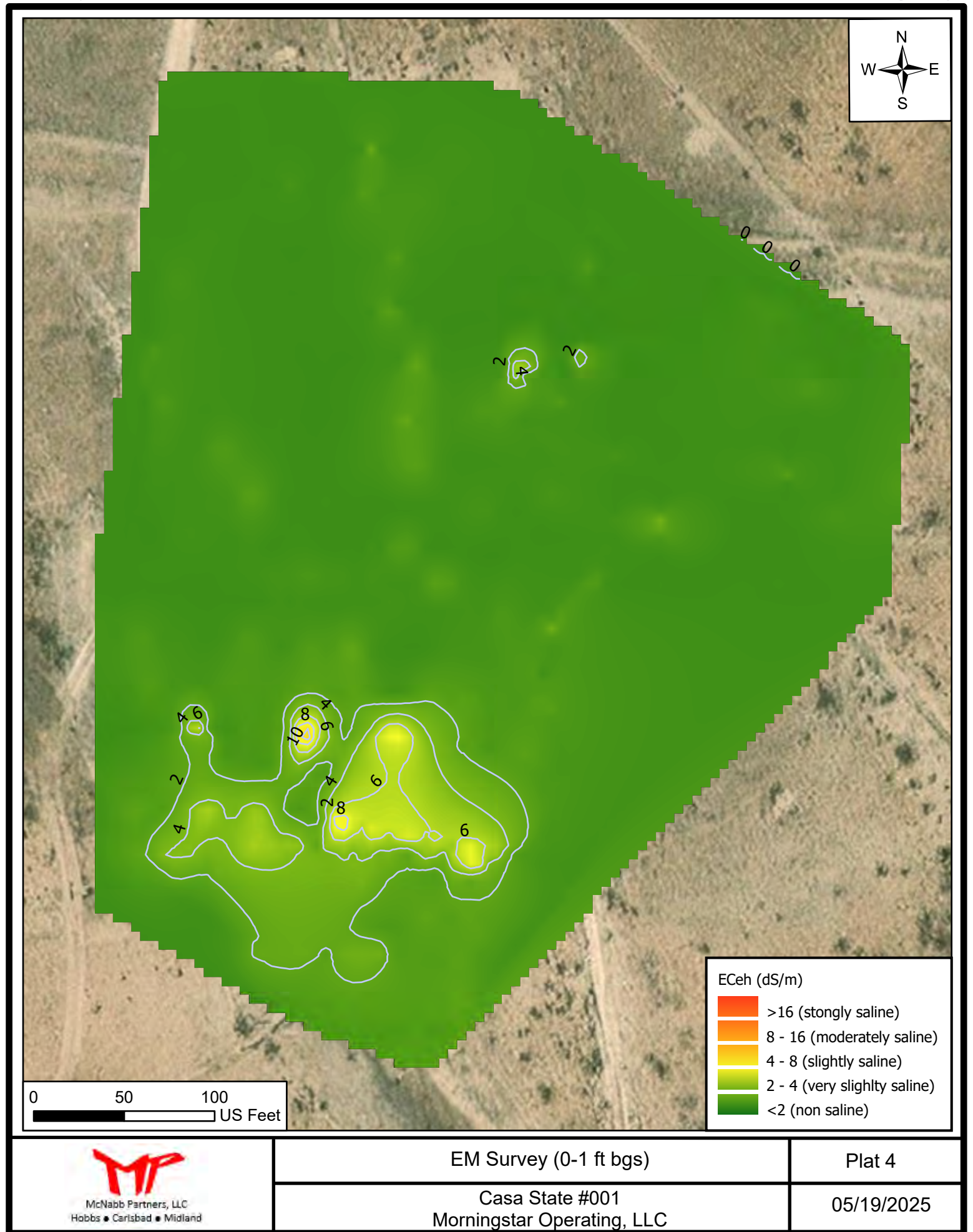


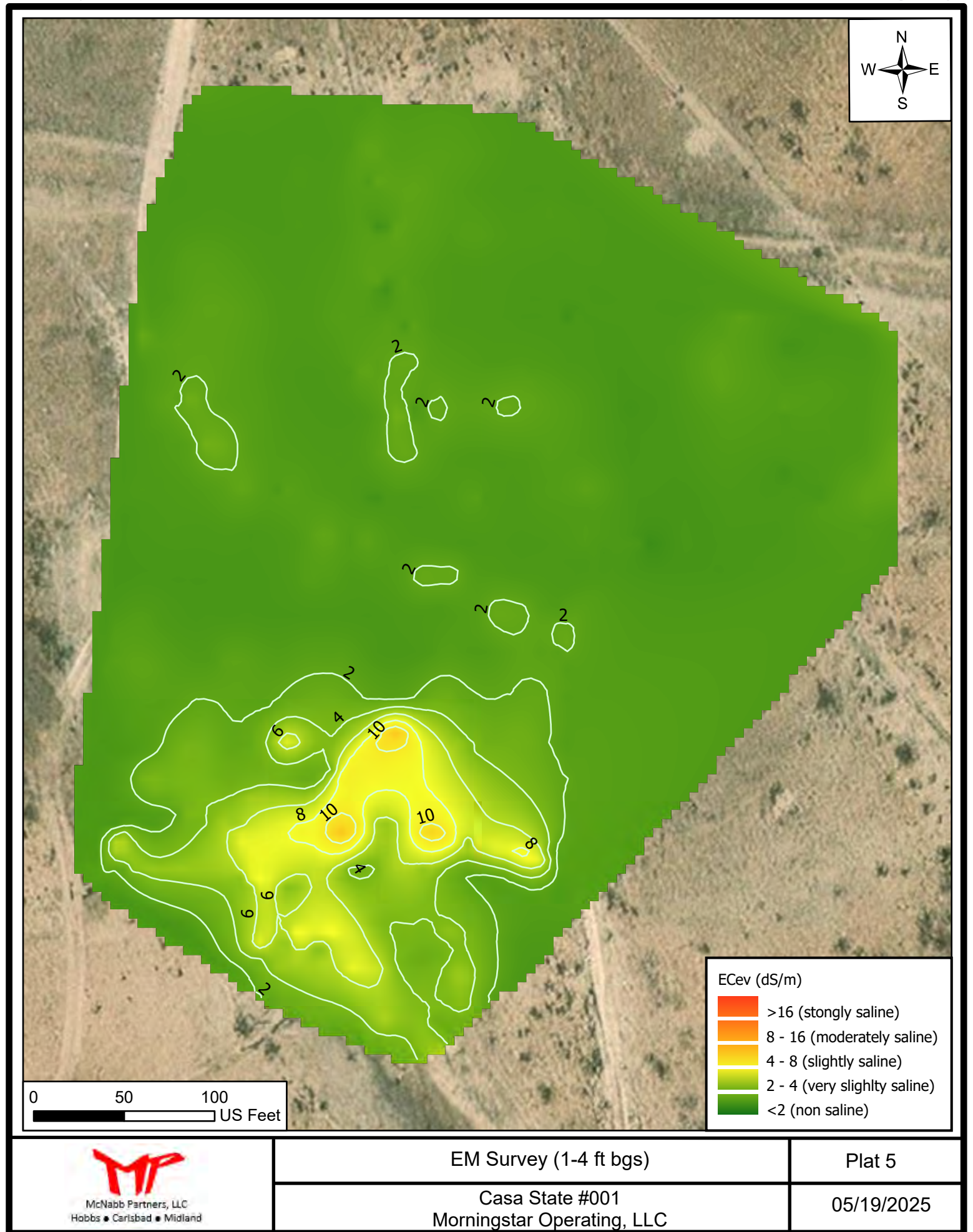
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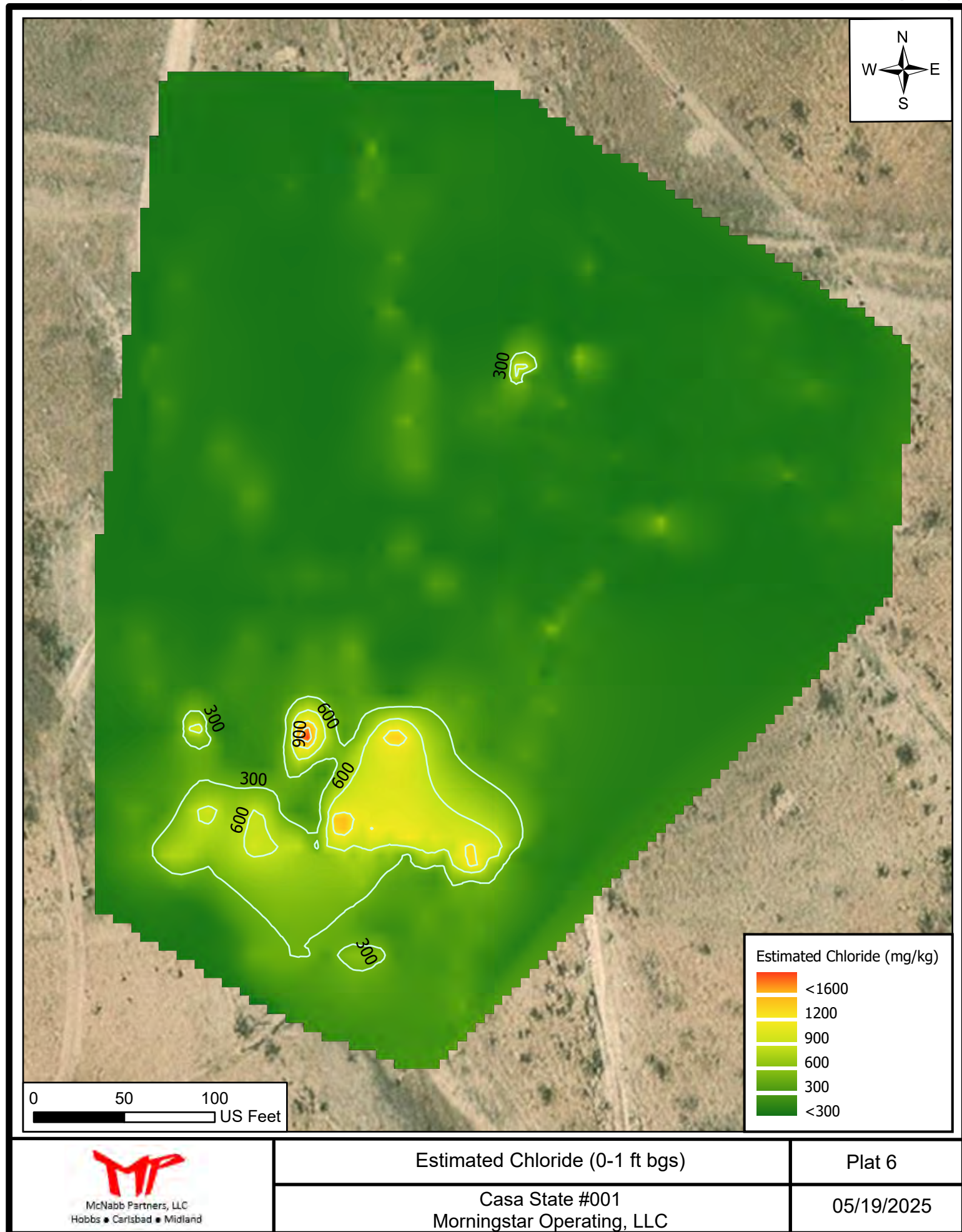


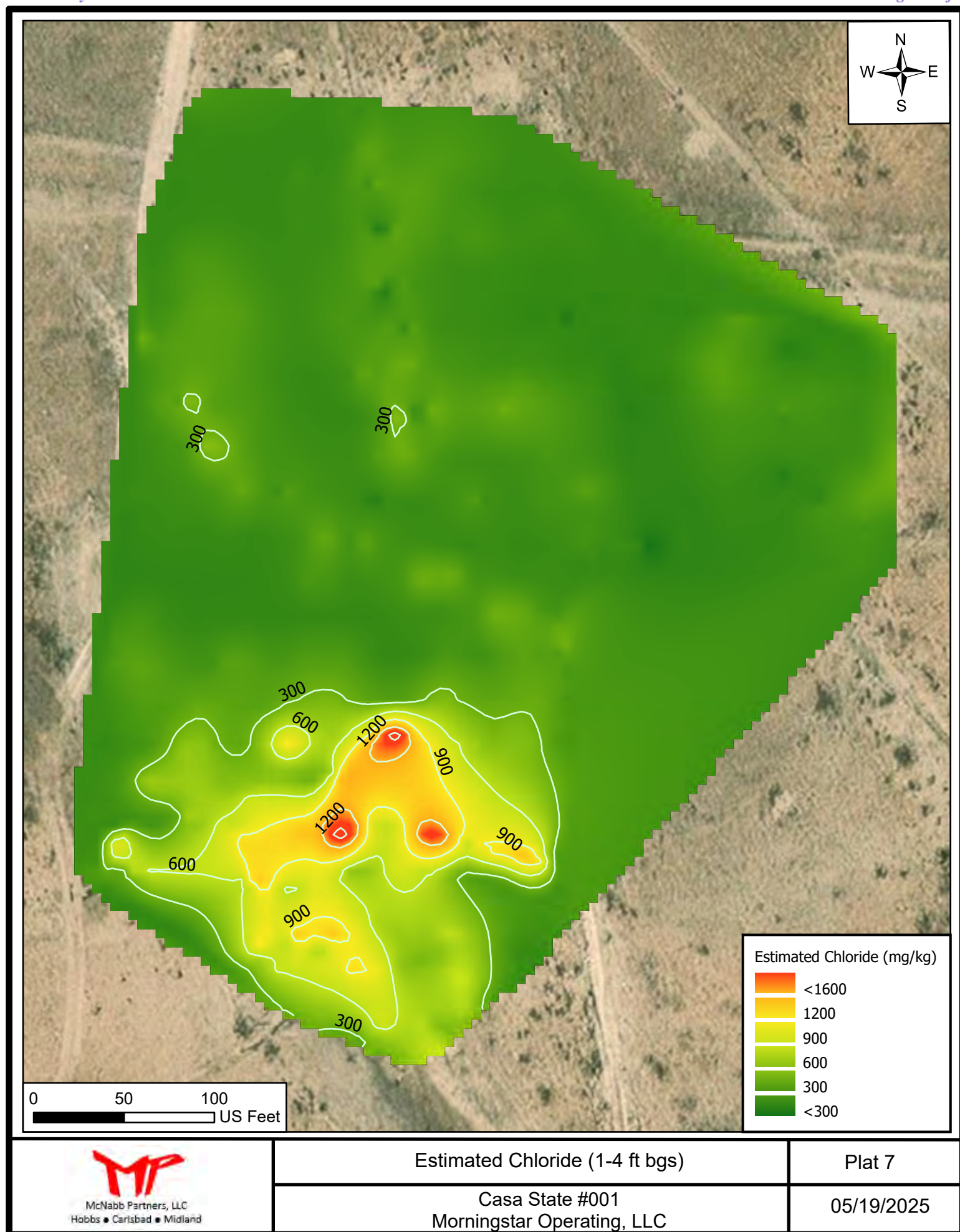


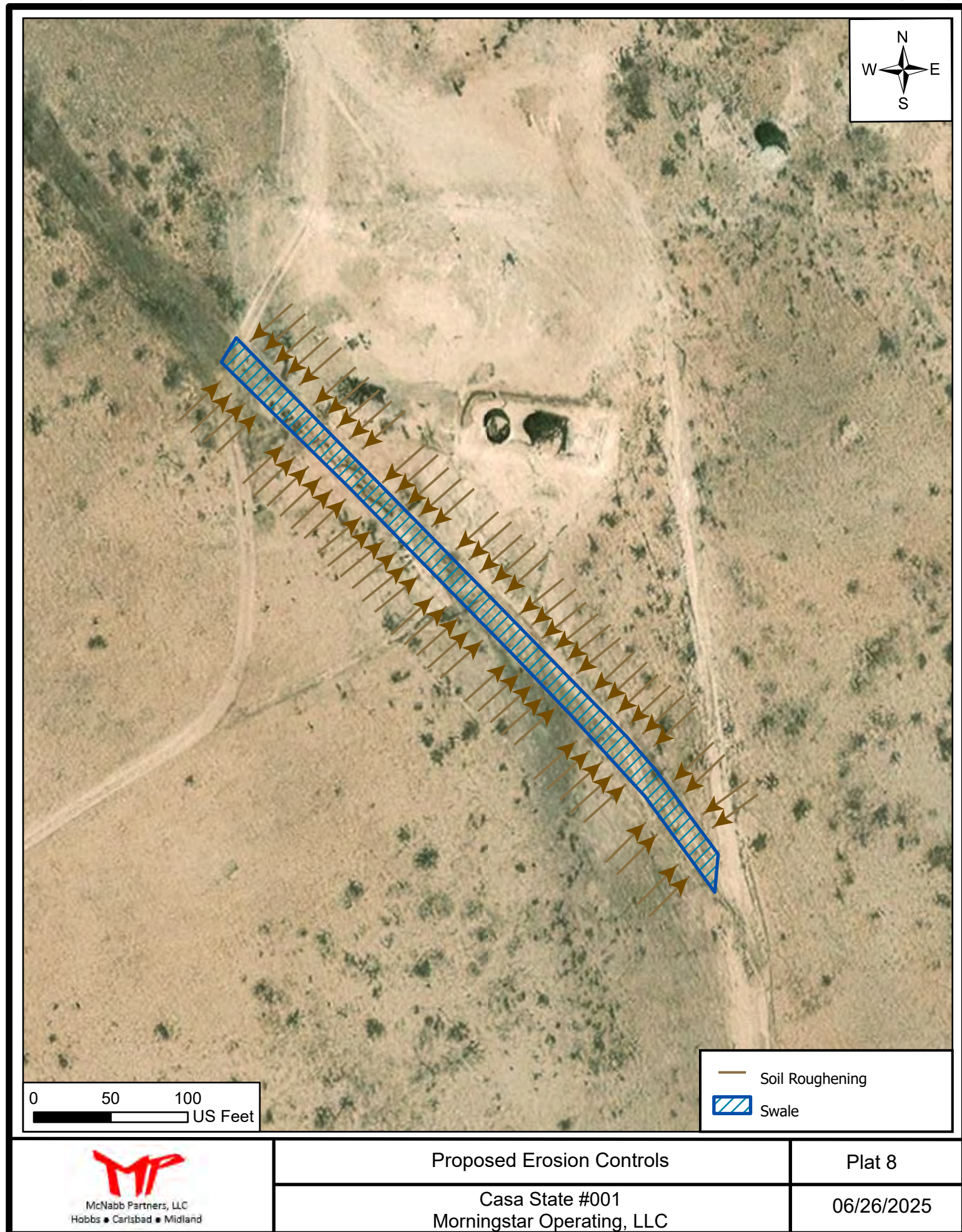














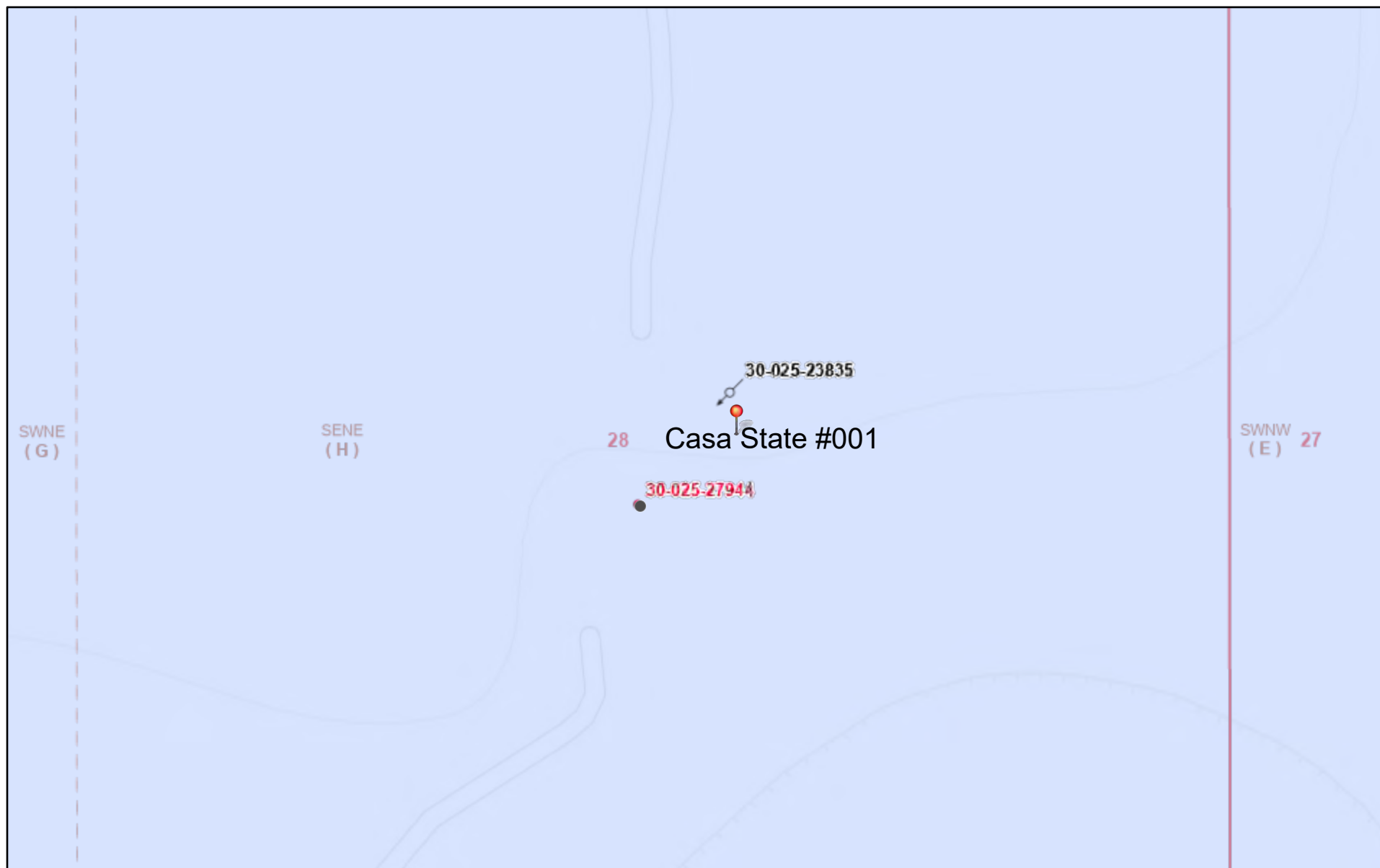
Appendix A

Site Characterization

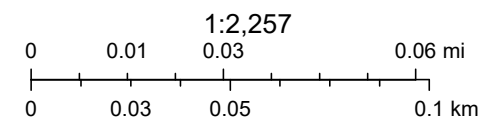
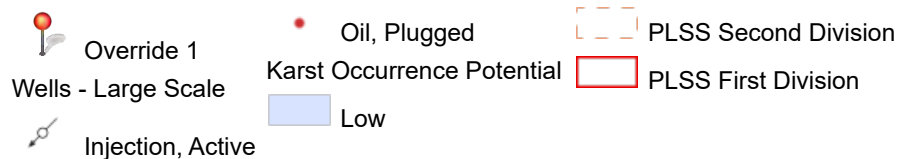


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NMOCD - Karst Potential



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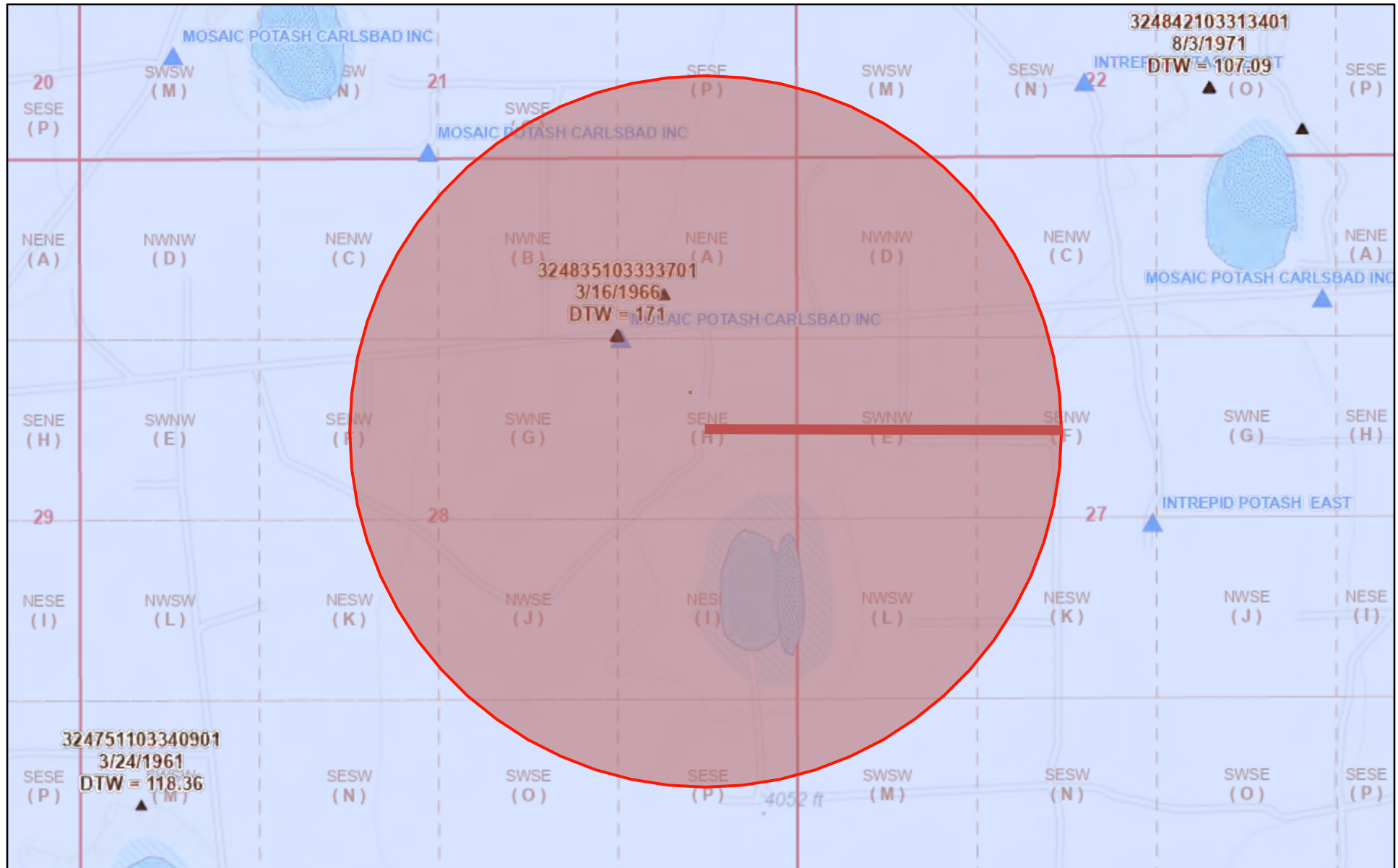


BLM, OCD, New Mexico Tech, OCD, Bureau of Land Management, Texas Parks & Wildlife, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA,

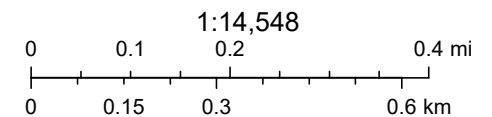
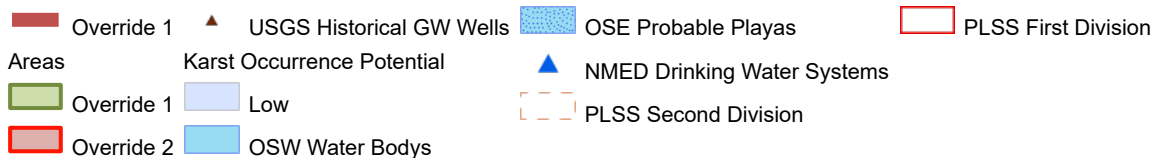
New Mexico Oil Conservation Division

NM OCD Oil and Gas Map. <http://nm-ernrd.maps.arcgis.com/apps/webappviewer/index.html?id=4d017f2306164de29fd2fb9f8f35ca75>: New Mexico Oil Conservation Division

USGS - Depth-to-Water (0.5-mile Radius)



6/4/2025, 6:50:45 PM



BLM, OCD, New Mexico Tech, USGS, Bureau of Land Management, Texas Parks & Wildlife, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA,

New Mexico Oil Conservation Division

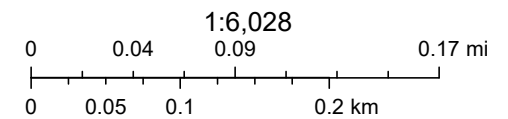
NM OCD Oil and Gas Map. <http://nm-ernrd.maps.arcgis.com/apps/webappviewer/index.html?id=4d017f2306164de29fd2fb9f8f35ca75>: New Mexico Oil Conservation Division

NMOSE - Fresh Water Well 1000-ft Buffer



6/30/2025, 11:43:53 AM

Override 1 GIS WATERS PODs
Override 1
Active

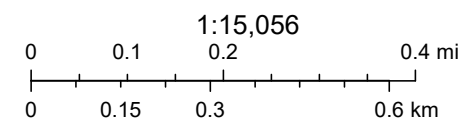
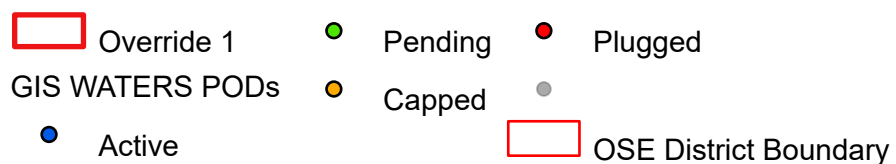


Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar

NMOSE - Depth-to-Water (0.5-mile Radius)



6/4/2025, 7:00:56 PM



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community, Maxar

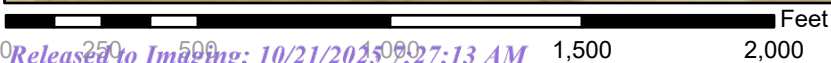
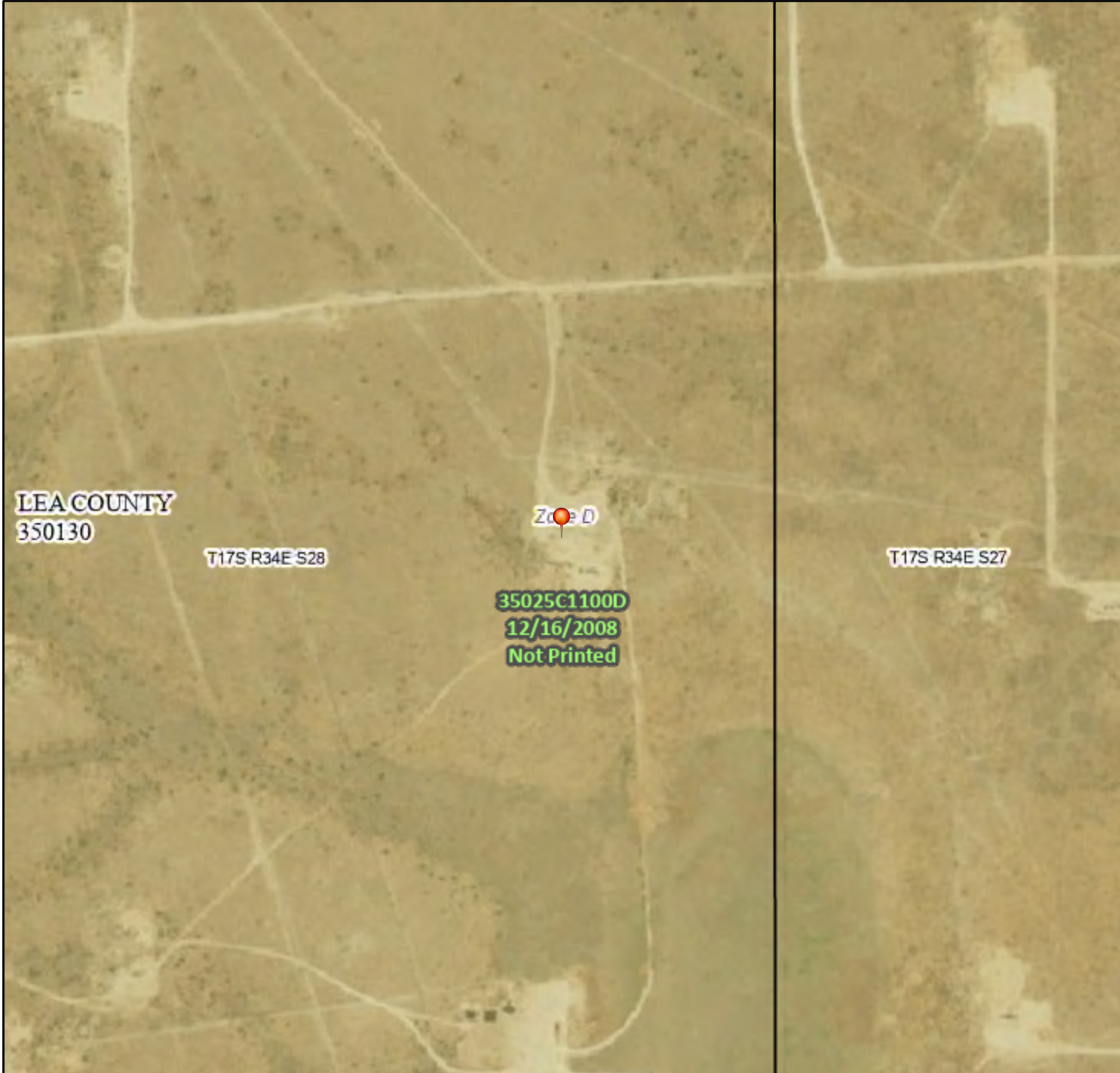
Online web user

This is an unofficial map from the OSE's online application.

National Flood Hazard Layer FIRMette



103°33'51"W 32°48'43"N



1:6,000

103°33'14"W 32°48'13"N

Released to Imaging: 10/21/2025 9:27:13 AM

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 Water Surface Elevation
		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped



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

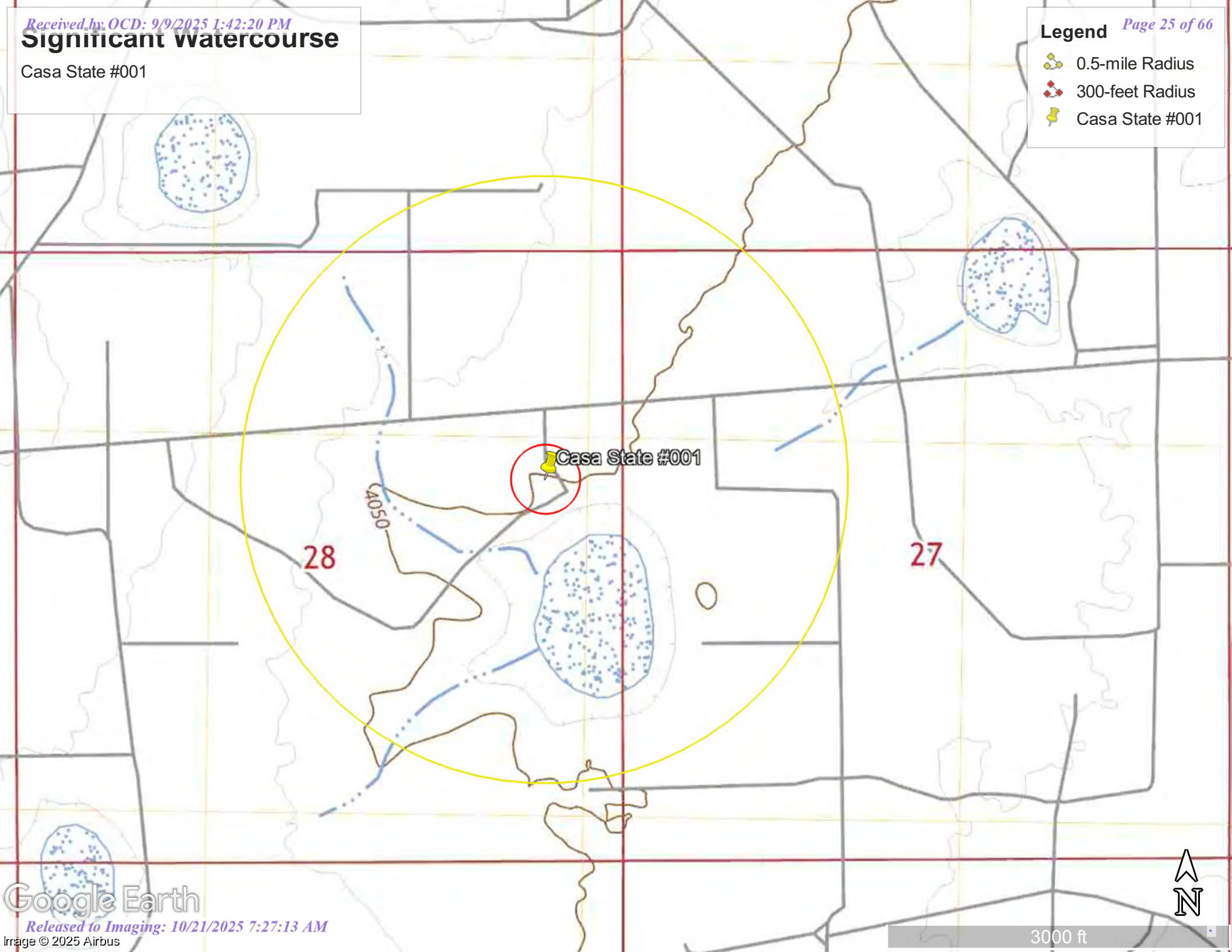
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 6/5/2025 at 2:19 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new 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.

Significant Watercourse

Casa State #001

- Legend**
- 0.5-mile Radius
 - 300-foot Radius
 - Casa State #001





Wetlands - Casa State #001



June 5, 2025

Wetlands

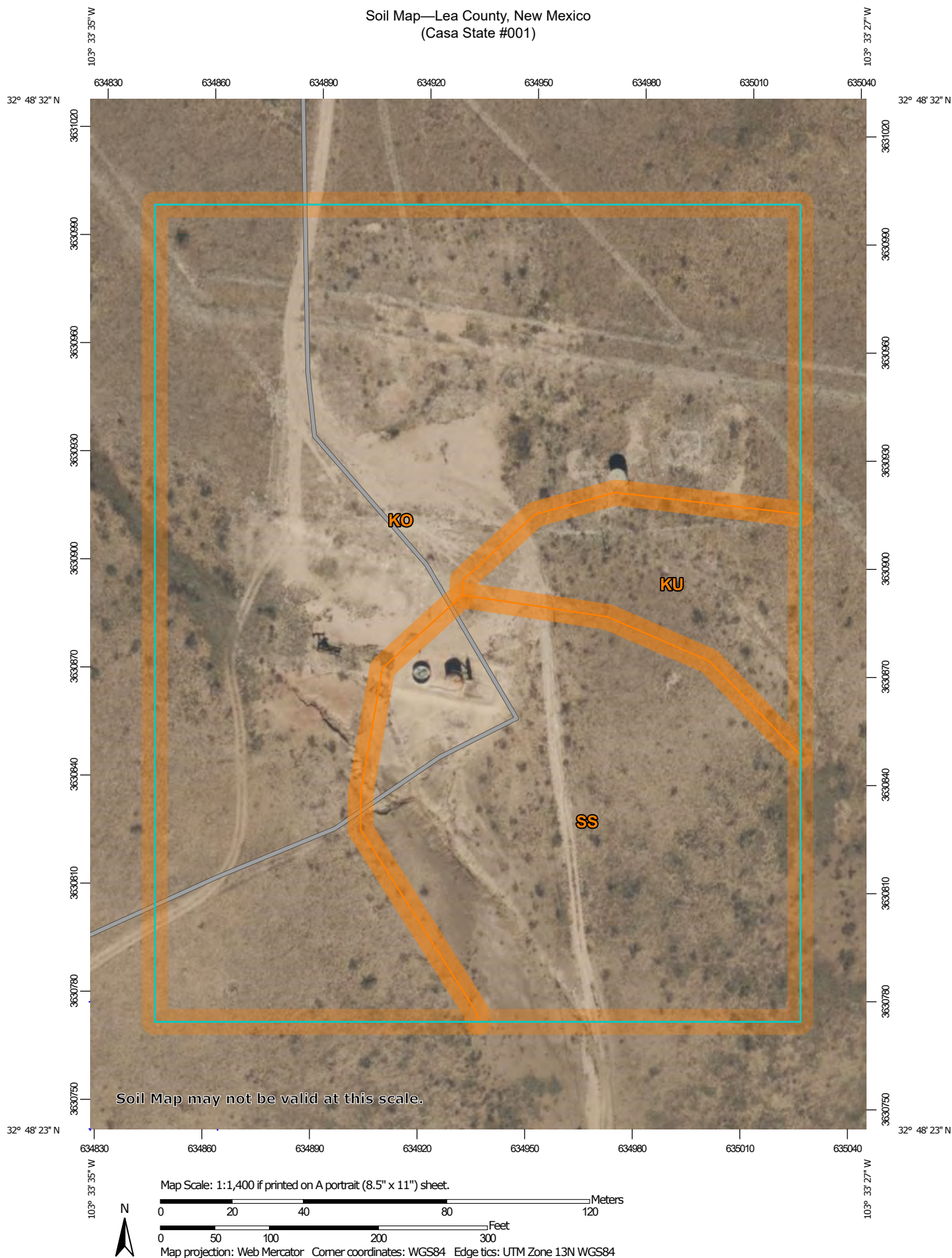
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond

- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Soil Map—Lea County, New Mexico
(Casa State #001)



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

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Soil Map—Lea County, New Mexico
(Casa State #001)

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: Lea County, New Mexico

Survey Area Data: Version 21, Sep 3, 2024

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

Date(s) aerial images were photographed: Feb 7, 2020—May 12, 2020

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.



Natural Resources
Conservation Service

Web Soil Survey
National Cooperative Soil Survey

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KO	Kimbrough gravelly loam, dry, 0 to 3 percent slopes	6.3	62.5%
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	0.8	8.4%
SS	Stegall and Slaughter soils	3.0	29.2%
Totals for Area of Interest		10.1	100.0%

Map Unit Description: Kimbrough gravelly loam, dry, 0 to 3 percent slopes---Lea County, New Mexico

Casa State #001

Lea County, New Mexico

KO—Kimbrough gravelly loam, dry, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tw43

Elevation: 2,500 to 4,800 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 57 to 63 degrees F

Frost-free period: 180 to 220 days

Farmland classification: Not prime farmland

Map Unit Composition

Kimbrough, dry, and similar soils: 80 percent

Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimbrough, Dry

Setting

Landform: Playa rims, plains

Down-slope shape: Convex, linear

Across-slope shape: Concave, linear

Parent material: Loamy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 3 inches: gravelly loam

Bw - 3 to 10 inches: loam

Bkkm1 - 10 to 16 inches: cemented material

Bkkm2 - 16 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 4 to 18 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 0.01 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 95 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 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Map Unit Description: Kimbrough gravelly loam, dry, 0 to 3 percent slopes---Lea County, New Mexico

Casa State #001

Hydrologic Soil Group: D
Ecological site: R077DY049TX - Very Shallow 12-17" PZ
Hydric soil rating: No

Minor Components

Eunice

Percent of map unit: 10 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: R077DY049TX - Very Shallow 12-17" PZ
Hydric soil rating: No

Spraberry

Percent of map unit: 6 percent
Landform: Playa rims, plains
Down-slope shape: Convex, linear
Across-slope shape: Linear
Ecological site: R077DY049TX - Very Shallow 12-17" PZ
Hydric soil rating: No

Kenhill

Percent of map unit: 4 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077DY038TX - Clay Loam 12-17" PZ
Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 21, Sep 3, 2024

Map Unit Description: Kimbrough-Lea complex, dry, 0 to 3 percent slopes---Lea County, New Mexico

Casa State #001

Lea County, New Mexico

KU—Kimbrough-Lea complex, dry, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tw46

Elevation: 2,500 to 4,800 feet

Mean annual precipitation: 14 to 16 inches

Mean annual air temperature: 57 to 63 degrees F

Frost-free period: 180 to 220 days

Farmland classification: Not prime farmland

Map Unit Composition

Kimbrough and similar soils: 45 percent

Lea and similar soils: 25 percent

Minor components: 30 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimbrough

Setting

Landform: Playa rims, plains

Down-slope shape: Convex, linear

Across-slope shape: Concave, linear

Parent material: Loamy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 3 inches: gravelly loam

Bw - 3 to 10 inches: loam

Bkkm1 - 10 to 16 inches: cemented material

Bkkm2 - 16 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: 4 to 18 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 0.01 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 95 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 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Map Unit Description: Kimbrough-Lea complex, dry, 0 to 3 percent slopes---Lea County, New Mexico

Casa State #001

Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R077DY049TX - Very Shallow 12-17" PZ
Hydric soil rating: No

Description of Lea

Setting

Landform: Plains
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Calcareous, loamy eolian deposits from the blackwater draw formation of pleistocene age over indurated caliche of pliocene age

Typical profile

A - 0 to 10 inches: loam
Bk - 10 to 18 inches: loam
Bkk - 18 to 26 inches: gravelly fine sandy loam
Bkkm - 26 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 22 to 30 inches to petrocalcic
Drainage class: Well drained
Runoff class: 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: 90 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 3.0
Available water supply, 0 to 60 inches: Very low (about 2.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Ecological site: R077DY047TX - Sandy Loam 12-17" PZ
Hydric soil rating: No

Minor Components

Douro

Percent of map unit: 12 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R077DY047TX - Sandy Loam 12-17" PZ
Other vegetative classification: Unnamed (G077DH000TX)
Hydric soil rating: No

Map Unit Description: Kimbrough-Lea complex, dry, 0 to 3 percent slopes---Lea County, New Mexico

Casa State #001

Kenhill

Percent of map unit: 12 percent

Landform: Plains

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R077DY038TX - Clay Loam 12-17" PZ

Hydric soil rating: No

Spraberry

Percent of map unit: 6 percent

Landform: Playa rims, plains

Down-slope shape: Convex, linear

Across-slope shape: Linear

Ecological site: R077DY049TX - Very Shallow 12-17" PZ

Other vegetative classification: Unnamed (G077DH000TX)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico

Survey Area Data: Version 21, Sep 3, 2024



Map Unit Description: Stegall and Slaughter soils---Lea County, New Mexico

Lea County, New Mexico

SS—Stegall and Slaughter soils

Map Unit Setting

National map unit symbol: dmr4

Elevation: 3,600 to 4,400 feet

Mean annual precipitation: 12 to 16 inches

Mean annual air temperature: 58 to 60 degrees F

Frost-free period: 190 to 205 days

Farmland classification: Farmland of statewide importance

Map Unit Composition

Stegall and similar soils: 40 percent

Slaughter and similar soils: 35 percent

Minor components: 25 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Stegall

Setting

Landform: Plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Alluvium derived from sedimentary rock

Typical profile

A - 0 to 9 inches: loam

Bt - 9 to 28 inches: clay loam

Bkm - 28 to 38 inches: cemented material

BCK - 38 to 60 inches: variable

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: 20 to 40 inches to petrocalcic

Drainage class: Well drained

Runoff class: Low

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: 90 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Map Unit Description: Stegall and Slaughter soils---Lea County, New Mexico

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C

Ecological site: R077CY028TX - Limy Upland 16-21" PZ

Hydric soil rating: No

Description of Slaughter**Setting**

Landform: Plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Calcareous alluvium and/or calcareous eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 2 inches: loam

Bt - 2 to 15 inches: clay

Bkm - 15 to 25 inches: cemented material

BCK - 25 to 60 inches: variable

Properties and qualities

Slope: 0 to 1 percent

Depth to restrictive feature: More than 80 inches; More than 80 inches

Drainage class: Well drained

Runoff class: Low

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: 90 percent

Gypsum, maximum content: 1 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water supply, 0 to 60 inches: Very low (about 2.4 inches)

Interpretive groups

Land capability classification (irrigated): 6s

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: D

Ecological site: R077CY028TX - Limy Upland 16-21" PZ

Hydric soil rating: No

Minor Components**Arvana**

Percent of map unit: 10 percent

Ecological site: R077CY035TX - Sandy 16-21" PZ

Map Unit Description: Stegall and Slaughter soils---Lea County, New Mexico

Hydric soil rating: No

Kimbrough

Percent of map unit: 9 percent

Ecological site: R077CY037TX - Very Shallow 16-21" PZ

Hydric soil rating: No

Portales

Percent of map unit: 6 percent

Ecological site: R077CY028TX - Limy Upland 16-21" PZ

Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico

Survey Area Data: Version 21, Sep 3, 2024

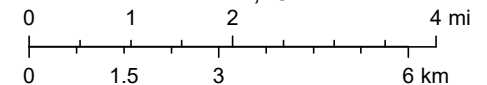
Special Status Plants and Wildlife Habitats, and Areas of Environmental Concern



6/4/2025

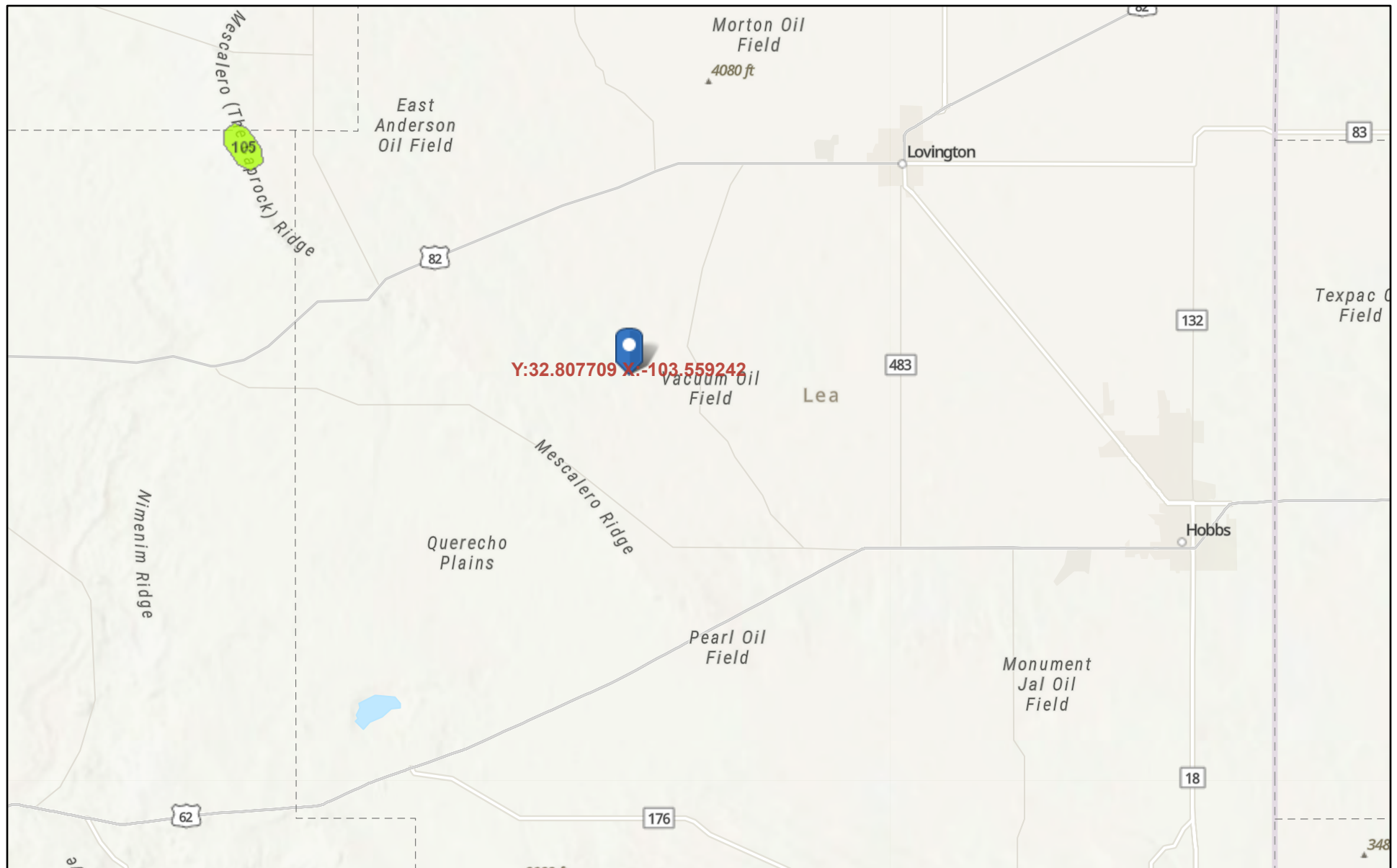
-  Dunes Sage Brush Lizard Habitat
-  Isolated Population Area
-  Lesser Prairie Chicken TR
-  Habitat Evaluation Area
- World_Hillshade

1:142,191



Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community,

NMFWS Important Plants, Birds and Critical Habitats Areas



June 5, 2025

IPA_20171012

B1 - Outstanding

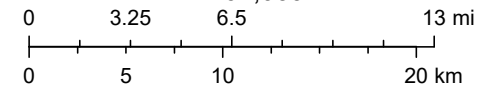
B2 - Very High

B3 - High

B4 - Moderate

NMAudubonIBA

1:464,039



Esri, CGIAR, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community, Audubon.org

Appendix B

Well Logs



McNabb Partners, LLC
Hobbs • Carlsbad • Midland



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National Water Information System: Web Interface

USGS Water Resources

Data Category:

Groundwater

▼

Geographic Area:

United States

▼

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- Explore the NEW [USGS National Water Dashboard](#) interactive map to access real-time water data from over 13,500 stations nationwide.

Groundwater levels for the Nation

Important: [Next Generation Monitoring Location Page](#)

Search Results -- 1 sites found

Agency code = usgs

site_no list =

- 324825103332601

Minimum number of levels = 1

[Save file of selected sites](#) to local disk for future upload

USGS 324825103332601 17S.34E.28.223

Lea County, New Mexico
Latitude 32°48'37", Longitude 103°33'35" NAD27
Land-surface elevation 4,058.00 feet above NGVD29
This well is completed in the High Plains aquifer (N100HGHPLN) national aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period

Date	Time	? Water-level date-time accuracy	? Parameter code	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	? Status	? Method of measurement	? Measuring agency	? Source of measurement	? Water-level approval status
1961-02-22			D62610		3926.50	NGVD29	1	Z			A
1961-02-22			D62611		3928.07	NAVD88	1	Z			A
1961-02-22			D72019	131.50			1	Z			A
1966-03-16			D62610		3886.95	NGVD29	P	Z			A
1966-03-16			D62611		3888.52	NAVD88	P	Z			A
1966-03-16			D72019	171.05			P	Z			A
1971-02-17			D62610		3921.84	NGVD29	1	Z			A
1971-02-17			D62611		3923.41	NAVD88	1	Z			A
1971-02-17			D72019	136.16			1	Z			A
1976-03-03			D62610		3909.09	NGVD29	1	Z			A
1976-03-03			D62611		3910.66	NAVD88	1	Z			A
1976-03-03			D72019	148.91			1	Z			A

Explanation

Section	Code	Description
Water-level date-time accuracy	D	Date is accurate to the Day
Parameter code	62610	Groundwater level above NGVD 1929, feet
Parameter code	62611	Groundwater level above NAVD 1988, feet
Parameter code	72019	Depth to water level, feet below land surface
Referenced vertical datum	NAVD88	North American Vertical Datum of 1988
Referenced vertical datum	NGVD29	National Geodetic Vertical Datum of 1929
Status	1	Static
Status	P	Pumping
Method of measurement	Z	Other.
Measuring agency		Not determined
Source of measurement		Not determined
Water-level approval status	A	Approved for publication -- Processing and review completed.

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Title: Groundwater for USA: Water Levels

URL: <https://nwis.waterdata.usgs.gov/nwis/gwlevels?>



Page Contact Information: [USGS Water Data Support Team](#)

Page Last Modified: 2025-06-05 06:30:57 EDT

0,38 0,3 nadww02



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National Water Information System: Web Interface

USGS Water Resources

Data Category:	Geographic Area:	
Groundwater	United States	GO

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Groundwater levels for the Nation

i Important: [Next Generation Monitoring Location Page](#)

Search Results -- 1 sites found

Agency code = usgs

site_no list =

- 324835103333701

Minimum number of levels = 1

[Save file of selected sites](#) to local disk for future upload

USGS 324835103333701 17S.34E.28.223333

Lea County, New Mexico

Latitude 32°48'34", Longitude 103°33'39" NAD27

Land-surface elevation 4,058.00 feet above NGVD29

The depth of the well is 242 feet below land surface.

This well is completed in the High Plains aquifer (N100HGHPLN) national aquifer.

This well is completed in the Ogallala Formation (121OGLL) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period

Date	Time	? Water-level date-time accuracy	? Parameter code	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	? Status	? Method of measurement	? Measuring agency	? Source of measurement	? Water-level approval status
1961-02-22			D	62610	3926.55	NGVD29	1	Z			A
1961-02-22			D	62611	3928.13	NAVD88	1	Z			A
1961-02-22			D	72019	131.45		1	Z			A
1966-03-16			D	62610	3887.00	NGVD29	P	Z			A
1966-03-16			D	62611	3888.58	NAVD88	P	Z			A
1966-03-16			D	72019	171.00		P	Z			A
1968-01-02			D	62610	3904.59	NGVD29	1	Z			A
1968-01-02			D	62611	3906.17	NAVD88	1	Z			A
1968-01-02			D	72019	153.41		1	Z			A
1969-01-14			D	62610	3924.99	NGVD29	1	Z			A
1969-01-14			D	62611	3926.57	NAVD88	1	Z			A
1969-01-14			D	72019	133.01		1	Z			A
1970-01-05			D	62610	3923.80	NGVD29	1	Z			A
1970-01-05			D	62611	3925.38	NAVD88	1	Z			A
1970-01-05			D	72019	134.20		1	Z			A
1971-01-12			D	62610	3921.93	NGVD29	1	Z			A
1971-01-12			D	62611	3923.51	NAVD88	1	Z			A
1971-01-12			D	72019	136.07		1	Z			A
1971-02-17			D	62610	3921.89	NGVD29	1	Z			A
1971-02-17			D	62611	3923.47	NAVD88	1	Z			A
1971-02-17			D	72019	136.11		1	Z			A
1972-01-12			D	62610	3919.32	NGVD29	1	Z			A
1972-01-12			D	62611	3920.90	NAVD88	1	Z			A
1972-01-12			D	72019	138.68		1	Z			A
1973-01-10			D	62610	3916.96	NGVD29	1	Z			A
1973-01-10			D	62611	3918.54	NAVD88	1	Z			A
1973-01-10			D	72019	141.04		1	Z			A
1974-01-08			D	62610	3914.74	NGVD29	1	Z			A
1974-01-08			D	62611	3916.32	NAVD88	1	Z			A
1974-01-08			D	72019	143.26		1	Z			A

Date	Time	? Water-level date- time accuracy	? Parameter code	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	? Status	? Method of measurement	? Measuring agency	? Source of measurement	? Water- level approval status
1975-01-08		D	62610		3912.33	NGVD29	1		Z		A
1975-01-08		D	62611		3913.91	NAVD88	1		Z		A
1975-01-08		D	72019	145.67			1		Z		A
1976-01-13		D	62610		3909.43	NGVD29	1		Z		A
1976-01-13		D	62611		3911.01	NAVD88	1		Z		A
1976-01-13		D	72019	148.57			1		Z		A
1976-03-03		D	62610		3909.14	NGVD29	1		Z		A
1976-03-03		D	62611		3910.72	NAVD88	1		Z		A
1976-03-03		D	72019	148.86			1		Z		A
1977-01-08		D	62610		3907.41	NGVD29	1		Z		A
1977-01-08		D	62611		3908.99	NAVD88	1		Z		A
1977-01-08		D	72019	150.59			1		Z		A
1978-01-04		D	62610		3905.57	NGVD29	1		Z		A
1978-01-04		D	62611		3907.15	NAVD88	1		Z		A
1978-01-04		D	72019	152.43			1		Z		A
1979-01-04		D	62610		3904.52	NGVD29	1		Z		A
1979-01-04		D	62611		3906.10	NAVD88	1		Z		A
1979-01-04		D	72019	153.48			1		Z		A
1980-01-03		D	62610		3903.39	NGVD29	1		Z		A
1980-01-03		D	62611		3904.97	NAVD88	1		Z		A
1980-01-03		D	72019	154.61			1		Z		A

Explanation

Section	Code	Description
Water-level date-time accuracy	D	Date is accurate to the Day
Parameter code	62610	Groundwater level above NGVD 1929, feet
Parameter code	62611	Groundwater level above NAVD 1988, feet
Parameter code	72019	Depth to water level, feet below land surface
Referenced vertical datum	NAVD88	North American Vertical Datum of 1988

Section	Code	Description
Referenced vertical datum	NGVD29	National Geodetic Vertical Datum of 1929
Status	1	Static
Status	P	Pumping
Method of measurement	Z	Other.
Measuring agency		Not determined
Source of measurement		Not determined
Water-level approval status	A	Approved for publication -- Processing and review completed.

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Title: Groundwater for USA: Water Levels

URL: <https://nwis.waterdata.usgs.gov/nwis/gwlevels?>



Page Contact Information: [USGS Water Data Support Team](#)
Page Last Modified: 2025-06-05 06:31:36 EDT
0.41 0.31 nadww02



NEW MEXICO OFFICE OF THE STATE ENGINEER

CHANGE OF OWNERSHIP OF WATER RIGHT (NON-72-12-1) FOR (check one):



Important: Acceptance of the form for filing by the State Engineer does not constitute verification of the right conveyed.

☐ Individual	☒ Corporation
☐ Trustee	☐ Partnership
☐ Estate	☐ Limited Liability Co.

1. OWNER OF RECORD (Seller)

Name: Mosaic Potash Carlsbad Inc.	Name:	
Phone: ☐ Home ☐ Cell	Phone: ☐ Home ☐ Cell	
Phone (Work):	Phone (Work):	
a. Owner of Record File No: L-03398	b. Sub-file No.:	c. Cause No.:

2. NEW OWNER (Buyer) Note: If more owners need to be listed, attach a separate sheet. Attached? ☐ Yes

Name: Mosaic Potash Carlsbad Inc.	Name: Commissioner of Public Lands
Contact or Agent: check here if Agent ☐ Attn: Jaspal (Paul) S. Gill	Contact or Agent: check here if Agent ☐
Mailing Address: 1361 Potash Mines Road	Mailing Address: 310 Old Santa Fe Trail
City: Carlsbad	City: Santa Fe
State: Zip Code: New Mexico 88220	State: Zip Code: New Mexico 87501
Phone: ☐ Home ☐ Cell Phone (Work): (575) 628-6279	Phone: ☐ Home ☐ Cell Phone (Work): (505) 827-5760
E-mail (optional):	E-mail (optional):

Required: Submit warranty deed(s) or other instrument(s) of conveyance properly recorded with the county clerk's office.

OSE DJI FEB 17 2021 PM 2:18

3. PURPOSE OF USE & AMOUNT CONVEYED

Check all that apply: ☐ Domestic ☒ Industrial ☐ Livestock ☐ Commercial ☐ Irrigation ☒ Other Uses (specify): Potash Mining or Refining and water flooding ☐ Municipal	Amount of Water (acre-feet per annum): If more details are needed, type "See Comments" in "Other" field below, and explain in Additional Statements Section. Diversion: _____ Consumptive Use: <u>1,200</u> Other (include units): _____
Owner of record has conveyed all or part of said right (please check one) ☒ All ☐ Part	

FOR OSE INTERNAL USE

Change of Ownership, Form wr-02, Rev 09/08/17

File No.: L-3398	Trn. No.: 688434	Well Tag ID No. (if applicable):
Trans Desc. (optional):	Sub-Basin: L	Receipt No.: 2-43011

4. LIST ALL KNOWN POINT(S) OF DIVERSION (POD) FOR THE WATER RIGHT CONVEYED

OSE POD No.	Well Tag ID No.	Subdivision and/or Lat/Long or Easting/Northing	Section	Township	Range
L-03398		NE1/4NE1/4	28	17 South	34 East

Check all that apply: ☒ Well ☐ Pump ☐ Ditch Name _____ ☐ River Course _____

5. PLACE(S) OF USE (list each individually)

a. _____ Acres of Irrigated Land Described as Follows (applicable to irrigation use only):

b. Legally Described By: ☐ Public Land Survey System (PLSS) ☐ Hydrographic Survey Report or Map ☐ Irrigation or Conservation District Map ☐ Subdivision PLSS Quarters or Halves, <u>and/or</u> Name of Hydrographic Survey or District, <u>and/or</u> Name and County of Subdivision	c. PLSS Section <u>and/or</u> Map No. <u>and/or</u> Lot No.	d. PLSS Township <u>and/or</u> Tract No. (Please list each tract individually) <u>and/or</u> Block No.	e. PLSS Range	f. Acres	g. Priority
Mosaic Potash Carlsbad Inc. Plant Site	9	19 South	30 East		01/04/1957
Eddy County, New Mexico					

h. Other description relating place of use to common landmarks, streets, or other:

i. Place of use is on land owned by:
Mosaic Potash Carlsbad Inc.

j. Are there other sources of water for these lands? No ☐ Yes ☒ If yes, describe by OSE file number:
Mosaic owns various water rights used at the place of use.

Note: If on Federal or State Land, please provide copy of lease**6. ADDITIONAL STATEMENTS OR EXPLANATIONS**

OSE BN FEB 17 2021 2:19

FOR OSE INTERNAL USE

Change of Ownership, Form wr-02, Rev 09/08/17

File No.: L-3398	Trn. No.: 688434	Well Tag ID No. (if applicable):
Trans Desc. (optional):	Sub-Basin: L	Receipt No.:

7. CONSENT TO LAWFUL CHANGE IN PLACE AND/OR PURPOSE OF USE

(to be completed only if it is an irrigation water right and has been conveyed separate from the land to which it was appurtenant.)

(I, We) the above owner(s) of record, hereby consent to a lawful change in the place and/or purpose of use of the above-described water right.

Signature _____

Signature _____

ACKNOWLEDGEMENT FOR INDIVIDUALI, We (name of owner(s)), _____
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Signature _____

Signature _____

State of _____)

ss.

County of _____)

This instrument was acknowledged before me this _____ day of _____ A.D., 20 _____, by (name of owner(s)):

Notary Public: _____

My commission expires: _____

ACKNOWLEDGEMENT FOR CORPORATIONI, We (name of owner(s)), Mosaic Potash Carlsbad Inc.
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Officer Signature P. Gill

Officer Signature _____

State of New Mexico)

ss.

County of Eddy)

DSE DJJ FEB 17 2021 PM 2:19

This instrument was acknowledged before me this 20th day of January A.D., 20 21, by the following on behalf of said corporation.Name of Officer: Jaspal (Paul) S. GillTitle of Officer: VP of OperationsName of Corporation Acknowledging: Mosaic Potash Carlsbad Inc

Notary Public: _____

My commission expires: _____

Jeanette Humphreys
12-21-23

FOR OSE INTERNAL USE

Change of Ownership, Form wr-02, Rev 09/08/17

File No.: <u>L-3398</u>	Trn. No.: <u>68843X</u>	Well Tag ID No. (if applicable):
Trans Desc. (optional):	Sub-Basin: <u>L</u>	Receipt No.:

7. CONSENT TO LAWFUL CHANGE IN PLACE AND/OR PURPOSE OF USE

(to be completed only if it is an irrigation water right and has been conveyed separate from the land to which it was appurtenant.)

(I, We) the above owner(s) of record, hereby consent to a lawful change in the place and/or purpose of use of the above-described water right:

Signature _____

Signature _____

ACKNOWLEDGEMENT FOR INDIVIDUALI, We (name of owner(s)), _____
Print Name(s)

affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Signature _____

Signature _____

State of _____)
County of _____)
ss.

This instrument was acknowledged before me this _____ day of _____ A.D., 20 _____, by (name of owner(s)):

Notary Public: _____

My commission expires: _____

ACKNOWLEDGEMENT FOR CORPORATIONI, We (name of owner(s)), Jordan Kessler, on behalf of Stephanie Garcia Richard (Commissioner of Public lands)
Print Name(s)

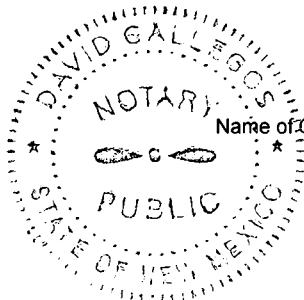
affirm that the foregoing statements are true to the best of (my, our) knowledge and belief.

Stephanie Garcia Richard
Officer Signature

Officer Signature _____

State of New Mexico)
County of Santa Fe)
ss.

DSE DJI FEB 17 2021 PM 2:19

This instrument was acknowledged before me this 1st day of February A.D., 20 21, by the following on behalf of said corporation.Name of Officer: Jordan Kessler, on behalf of Stephanie Garcia Richard, Commissioner of Public LandsTitle of Officer: Assistant Commissioner for Mineral ResourcesName of Corporation Acknowledging: New Mexico State Land OfficeState of Corporation: New MexicoNotary Public: David GallegosMy commission expires: 7/31/2022

FOR OSE INTERNAL USE

Change of Ownership, Form wr-02, Rev 10/21/19

File No.: <u>L-3398</u>	Trn. No.: <u>688434</u>	Well Tag ID No. (if applicable):
Trans Desc. (optional):	Sub-Basin: <u>L</u>	Receipt No.:

John R. D Antonio, Jr., P.E.
State Engineer



Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

**STATE OF NEW MEXICO
OFFICE OF THE STATE ENGINEER**

Trn Nbr: 688434
File Nbr: L 03398

Feb. 23, 2021

MODRALL SPERLING
BARBARA C LUCERO, CP
PO BOX 2168
ALBUQUERQUE, NM 87103-2168

RE: JASPAL (PAUL) S GILL
MOSAIC POTASH CARLSBAD INC
1361 POTASH MINES ROAD
CARLSBAD, NM 88220

RE: STEPHANIE GARCIA RICHARD
NEW MEXICO STATE LAND
COMMISSIONER OF PUBLIC LANDS
310 OLD SANTA FE TRAIL
SANTA FE, NM 87501

Greetings:

Enclosed is one original copy of a Change of Ownership of a Water Right submitted to this office for filing. This Change of Ownership is accepted for filing in accordance with Section 72-1-2.1, NMSA 1978 (1996 Supp.), effective May 15, 1996. The acceptance by the State Engineer Office does not constitute validation of the right claimed.

According to Section 72-1-2.1, NMSA 1978 (1996 Supp.), you must record this Change of Ownership with the clerk of the county in which the water is located. The filing shall be public notice of the existence and contents of the instruments so recorded.

Sincerely,

A handwritten signature in cursive script, appearing to read "Y Mendiola".

Yolanda Mendiola
(575) 622-6521

Enclosure

chngowrc



February 11, 2021

Barbara C. Lucero, CP
Certified Paralegal
505.848.1865 Direct
505.848.9710 Facsimile
barbaral@modrall.com

VIA FEDEX (7728 3719 0605)

Mr. Andy V. Morley
District Manager
Office of the State Engineer - District II
1900 West Second Street
Roswell, NM 88201-1712

Re: Filings on behalf of Mosaic Potash Carlsbad Inc.

Dear Mr. Morley:

On behalf of Mosaic Potash Carlsbad Inc., we hereby file triplicate originals and one copy each of two Changes of Ownership of Water Rights along with the combined filing fee of \$4.00 regarding OSE File Nos.:

- L-03616 thru L-03616-S-7
- L-03398

Please return conformed copies of the filings in the enclosed self-addressed stamped envelope.

Please send all communication regarding this matter including the accepted Changes of Ownership of Water Rights to my attention at the address below.
Thank you for your assistance.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Barbara C. Lucero', is written over the typed name.

Barbara C. Lucero, CP
Paralegal

Enclosures as stated

Modrall Sperling
Roehl Harris & Sisk P.A.

500 Fourth Street NW
Suite 1000
Albuquerque,
New Mexico 87102

PO Box 2168
Albuquerque,
New Mexico 87103-2168

Tel: 505.848.1800
www.modrall.com

Appendix C

Electromagnetic Survey Information



McNabb Partners, LLC
Hobbs • Carlsbad • Midland

Electromagnetic Induction Survey Orientation

Electromagnetic Induction Surveys (EM Surveys) are commonly used to measure apparent electrical conductivity (ECa, “soil salinity”) in soils without intrusive sampling. Employing a Geonics EM38-MK2 (Exhibit 1), field personnel can effectively delineate the horizontal extent of saline soils by measuring ECa and monitoring for ECa changes between background and higher EC readings.



Exhibit 1: Measuring ECa with the EM38 in the horizontal dipole position.

The EM Survey is conducted in the horizontal (h) and vertical (v) dipole modes at 0.5 and 1.0-meter coil separations. The EM38 can effectively measure salinity to a depth of 1-meter (4.9-feet). Sensitivity to surface material is presented in Table 1 and Figures 1a & 1b. Each coil separation and dipole mode listed in Table 1 is recorded by the EM38; allowing for the evaluation of salinity relative to depth over the four (4) depth ranges. The EM38 can record up to 5 measurements per second.

Coil Separation meters	Dipole Mode	Greatest Sensitivity meters (feet)	Relative Range	
			Depth (meters)	Depth (feet)
0.5				
	Horizontal	0	0 - 0.4	0 - 1.3
	Vertical	0.2 (0.66)	0.2 - 0.8	0.7 - 2.5
1				
	Horizontal	0	0 - 0.8	0 - 2.5
	Vertical	0.4 (1.31)	0.4 - 1.5	1.3 - 4.9

Table 1: EM38-MK2 Sensitivity Ranges

Electromagnetic Induction Survey Orientation

The difference in sensitivity ranges in the two coil configurations and dipole modes is important; the horizontal dipole mode will be relatively sensitive to variations near surface whereas the vertical dipole mode will be insensitive near the surface and sensitive at greater depths. This difference in sensitivity allows for a quick method for determining whether the near surface soil is more conductive (higher salinity) than soils at depth, where

if a higher EC_a reading is obtained in the horizontal position than the vertical position, chloride has likely impacted the upper surface more than soils at lower depths. If a higher EC_a reading is obtained in the vertical position than the horizontal position, chloride has likely impacted soils at lower depths than the upper surface soils.

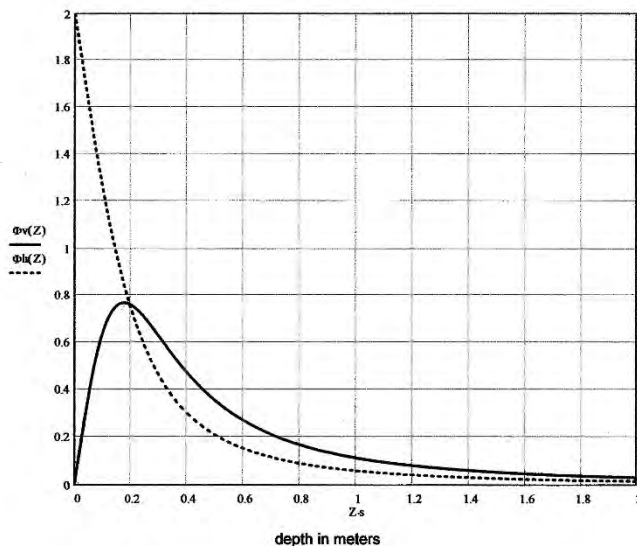


Figure 1a: 0.5-meter coil separation. Relative sensitivity with depth. Dashed line horizontal dipole mode. Solid line vertical dipole mode.

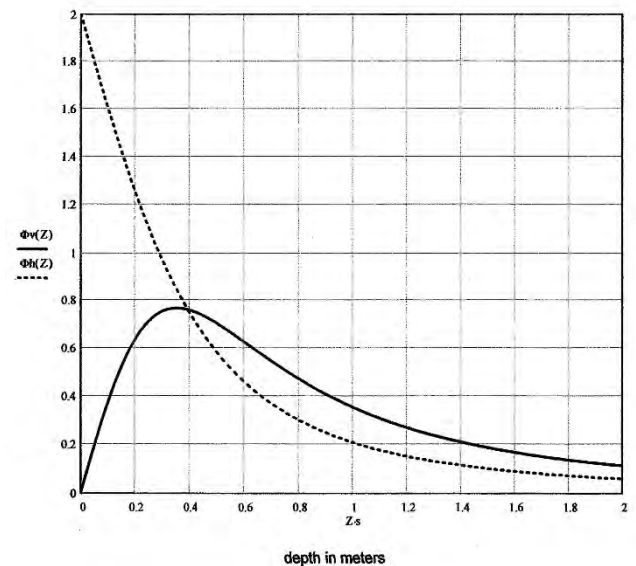


Figure 1b: 1.0-meter coil separation. Relative sensitivity with depth. Dashed line horizontal dipole mode. Solid line vertical dipole mode.

It is important to note that the EM38 is very susceptible to metal and electrical interferences. A metal object small as a steel nail can cause the apparent electrical conductivity to read high or go negative. EM Surveys near pipelines, wellheads, tank batteries, and powerlines must account for these interferences. The EM38 records both metal susceptibility and EC_a during each measurement.

Electromagnetic Induction Survey Orientation

ECa concentrations measured by the Geonics EM38-MK2 instrument can be converted into effective electrical conductivity (ECe) concentrations using the generalized equation $ECe = 5ECa^{1,2}$. ECe is commonly used to determine the soil salinity class to evaluate plant productivity. Soil ECe can also be analyzed in a laboratory setting.

The Natural Resources Conservation Service (NRCS) publishes salinity classes (Table 2) to determine the salinity of soils based on ECe concentrations. The New Mexico State Land Office *Revegetation Guidelines Handbook for Southeastern NM, Soil Suitability Criteria* adopted the NRCS salinity class that establishes an $ECe < 4$ dS/m as suitable soils for surface reclamations.

NRCS Field Guide	
Salinity Class	ECe (dS/m)
Nonsaline	<2
Very Slightly Saline	2 - 4
Slightly Saline	4 - 8
Moderately Saline	8 - 16
Strongly Saline	>16

Table 2: Salinity Classes as defined by Natural Resources Conservation Service (NRCS)

Furthermore, ECe can be estimated by using a set of conversion factors³ based on common soil types, where

$$\text{Eq 1.} \quad ECe = EC_{1:5} \times CF$$

$EC_{1:5} = 20\text{ml soil}:100\text{ml deionized water then mix, let settle, and test}^4$.

Hazelton Guide ²	CF
Sand	17
Sandy Loam	11
Loam	10
Clay Loam	9
Light Medium Clay	8
Medium Clay	7
Heavy Clay	6

Table 3: Conversion Factors (CF) to calculate between $EC_{1:5}$ and ECe.

¹ McNeill, J.D. 1986. Rapid Accurate Mapping of Soil Salinity by Electromagnetic Ground Conductivity Meters. Geonics Limited Technical Note TN-18, Geonics Ltd., Mississauga, ON.

² ECe is expressed in dS/m. ECa is expressed in mS/m. A conversion factor of 100 is applied to convert mS/m to dS/m. $ECe = 5(ECa/100)$.

³ Hazelton, P. A. and Murphy, B.W. ed. (1992) *What do all the numbers mean? A guide for the interpretation of Soil Test Results*. Department of Conservation and Land Management (incorporating the Soil Conservation Service of NSW), Sydney.

⁴ $EC_{1:5}$ is measured with a Hanna DiST4 EC Tester. $EC_{1:5}$ is commonly used for salinity field screening.

Electromagnetic Induction Survey Orientation

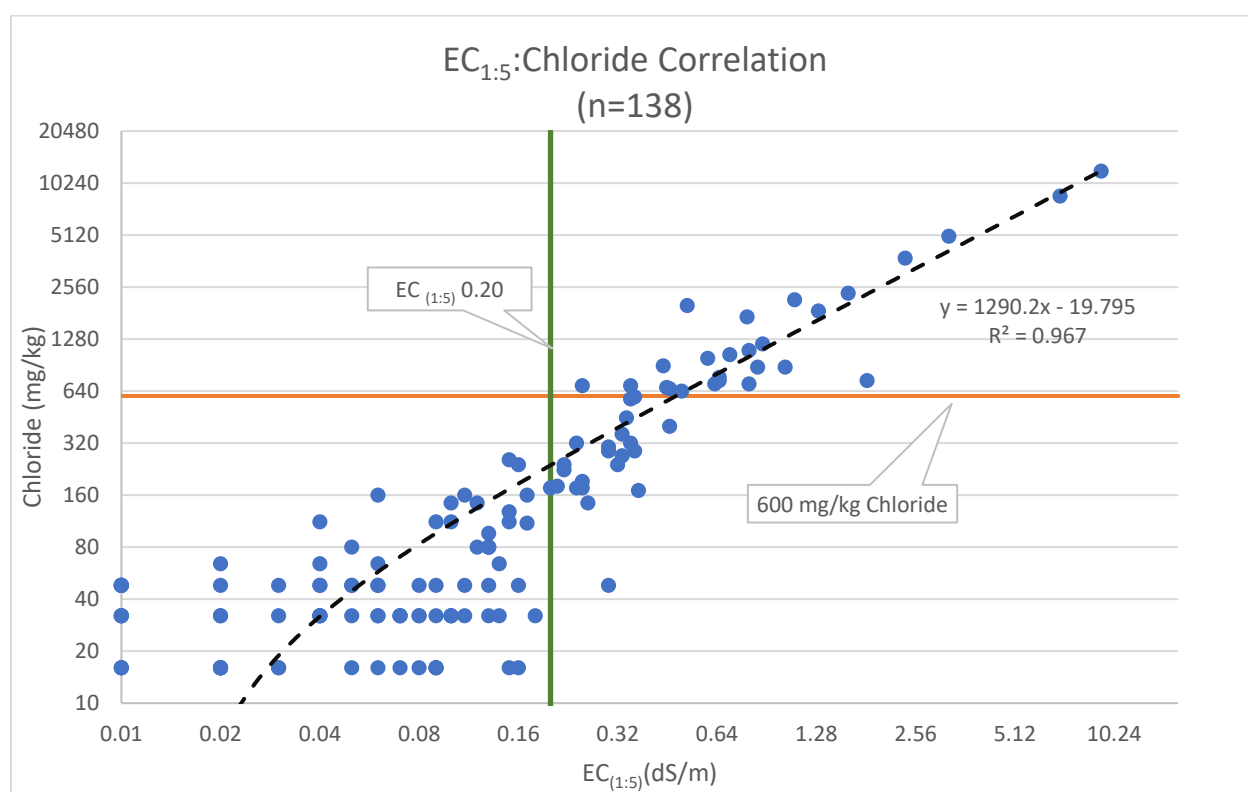
Chloride concentrations can be estimated from ECa by converting

$$ECa \rightarrow ECe \rightarrow EC_{1:5} \rightarrow \text{Chloride}$$

Converting $EC_{1:5}$ to Chloride uses regression analysis to calculate the y-intercept, where

$$\text{Eq. 2: } y = 1290.2x - 19.795$$

The below chart shows the correlation between $EC_{1:5}$ and laboratory analyzed chloride concentrations measured over 139 sample points ($n=138$). Analysis of data shows that $EC_{1:5}$ measurements greater than 0.20 dS/m (mS/cm) has potential to exhibit chloride concentrations greater than 600 mg/kg, which is NMOCD's Closure Criteria for remediation of spills in the upper 4-feet.



Equation 3 converts ECa to an estimated Chloride (Cl_{est}) concentration, where

$$\text{Eq. 3: } Cl_{est} = (1290.2x) - 19.795, \text{ where}$$

$$x = EC_{1:5} = \left(\frac{ECe}{CF} \right)$$

$$ECe = 5 \left(\frac{ECa}{100} \right)$$

Electromagnetic Induction Survey Orientation

Applying Equation 3 to an ECa reading of 250 mS/m yields the following estimated chloride (Cl_{est}) concentrations.

To estimate chloride from EM38 ECa measurement					
ECa (mS/m)	ECe (dS/m)	Soil Type	CF	EC1:5 (dS/m)	Estimated Cl (mg/kg)
250	12.5	Sand	17	0.74	929
		Sandy Loam	11	1.14	1446
		Loam	10	1.25	1593
		Clay Loam	9	1.39	1772
		Light Medium Clay	8	1.56	1996
		Medium Clay	7	1.79	2284
		Heavy Clay	6	2.08	2668



Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

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

QUESTIONS

Action 502794

QUESTIONS

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 502794
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Prerequisites	
Incident ID (n#)	nPRS0522035374
Incident Name	NPRS0522035374 CASA STATE #001 @ 30-025-27944
Incident Type	Produced Water Release
Incident Status	Remediation Plan Received
Incident Well	[30-025-27944] CASA STATE #001

Location of Release Source	
<i>Please answer all the questions in this group.</i>	
Site Name	CASA STATE #001
Date Release Discovered	04/01/2005
Surface Owner	State

Incident Details	
<i>Please answer all the questions in this group.</i>	
Incident Type	Produced Water Release
Did this release result in a fire or is the result of a fire	No
Did this release result in any injuries	No
Has this release reached or does it have a reasonable probability of reaching a watercourse	No
Has this release endangered or does it have a reasonable probability of endangering public health	No
Has this release substantially damaged or will it substantially damage property or the environment	No
Is this release of a volume that is or may with reasonable probability be detrimental to fresh water	No

Nature and Volume of Release	
<i>Material(s) released, please answer all that apply below. Any calculations or specific justifications for the volumes provided should be attached to the follow-up C-141 submission.</i>	
Crude Oil Released (bbls) Details	Not answered.
Produced Water Released (bbls) Details	Cause: Equipment Failure Water Tank Produced Water Released: 7 BBL Recovered: 0 BBL Lost: 7 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	No
Condensate Released (bbls) Details	Not answered.
Natural Gas Vented (Mcf) Details	Not answered.
Natural Gas Flared (Mcf) Details	Not answered.
Other Released Details	Not answered.
Are there additional details for the questions above (i.e. any answer containing Other, Specify, Unknown, and/or Fire, or any negative lost amounts)	A historical incident on a location due for reclamation. A reclamation & excavation work plan has been approved by NMSLO- ECO.

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QUESTIONS, Page 2

Action 502794

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 502794
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	No, according to supplied volumes this does not appear to be a "gas only" report.
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	No
Reasons why this would be considered a submission for a notification of a major release	<i>Unavailable.</i>
<i>With the implementation of the 19.15.27 NMAC (05/25/2021), venting and/or flaring of natural gas (i.e. gas only) are to be submitted on the C-129 form.</i>	

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	True
The impacted area has been secured to protect human health and the environment	True
Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices	True
All free liquids and recoverable materials have been removed and managed appropriately	True
If all the actions described above have not been undertaken, explain why	<i>Not answered.</i>

Per Paragraph (4) of Subsection B of 19.15.29.8 NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please prepare and attach a narrative of actions to date in the follow-up C-141 submission. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see Subparagraph (a) of Paragraph (5) of Subsection A of 19.15.29.11 NMAC), please prepare and attach all information needed for closure evaluation in the follow-up C-141 submission.

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.

I hereby agree and sign off to the above statement	Name: Samanntha Avarello Title: EHS Coordinator Email: savarello@txoenergy.com Date: 09/09/2025
--	---

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QUESTIONS, Page 3

Action 502794

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 502794
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Site Characterization	
<i>Please answer all the questions in this group (only required when seeking remediation plan approval and beyond). This information must be provided to the appropriate district office no later than 90 days after the release discovery date.</i>	
What is the shallowest depth to groundwater beneath the area affected by the release in feet below ground surface (ft bgs)	Between 100 and 500 (ft.)
What method was used to determine the depth to ground water	NM OSE iWaters Database Search
Did this release impact groundwater or surface water	No
What is the minimum distance, between the closest lateral extents of the release and the following surface areas:	
A continuously flowing watercourse or any other significant watercourse	Between 300 and 500 (ft.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between 300 and 500 (ft.)
An occupied permanent residence, school, hospital, institution, or church	Greater than 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between 1 and 5 (mi.)
Any other fresh water well or spring	Between 500 and 1000 (ft.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between 300 and 500 (ft.)
A subsurface mine	Between 1 and 5 (mi.)
An (non-karst) unstable area	Between 1 and 5 (mi.)
Categorize the risk of this well / site being in a karst geology	Low
A 100-year floodplain	Between 1 and 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	Yes

Remediation Plan	
<i>Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.</i>	
Requesting a remediation plan approval with this submission	Yes
<i>Attach a comprehensive report demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined, pursuant to 19.15.29.11 NMAC and 19.15.29.13 NMAC.</i>	
Have the lateral and vertical extents of contamination been fully delineated	Yes
Was this release entirely contained within a lined containment area	No
Soil Contamination Sampling: (Provide the highest observable value for each, in milligrams per kilograms.)	
Chloride (EPA 300.0 or SM4500 Cl B)	1600
TPH (GRO+DRO+MRO) (EPA SW-846 Method 8015M)	0
GRO+DRO (EPA SW-846 Method 8015M)	0
BTEX (EPA SW-846 Method 8021B or 8260B)	0
Benzene (EPA SW-846 Method 8021B or 8260B)	0
<i>Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.</i>	
On what estimated date will the remediation commence	09/08/2025
On what date will (or did) the final sampling or liner inspection occur	10/08/2025
On what date will (or was) the remediation complete(d)	11/08/2025
What is the estimated surface area (in square feet) that will be reclaimed	63000
What is the estimated volume (in cubic yards) that will be reclaimed	9333
What is the estimated surface area (in square feet) that will be remediated	16700
What is the estimated volume (in cubic yards) that will be remediated	2721
<i>These estimated dates and measurements are recognized to be the best guess or calculation at the time of submission and may (be) change(d) over time as more remediation efforts are completed.</i>	
<i>The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.</i>	

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QUESTIONS, Page 4

Action 502794

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 502794
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Remediation Plan (continued)	
<i>Please answer all the questions that apply or are indicated. This information must be provided to the appropriate district office no later than 90 days after the release discovery date.</i>	
This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:	
<i>(Select all answers below that apply.)</i>	
(Ex Situ) Excavation and off-site disposal (i.e. dig and haul, hydrovac, etc.)	Yes
Which OCD approved facility will be used for off-site disposal	fEEM0112342028 LEA LAND LANDFILL
OR which OCD approved well (API) will be used for off-site disposal	Not answered.
OR is the off-site disposal site, to be used, out-of-state	Not answered.
OR is the off-site disposal site, to be used, an NMED facility	Not answered.
(Ex Situ) Excavation and on-site remediation (i.e. On-Site Land Farms)	Not answered.
(In Situ) Soil Vapor Extraction	Not answered.
(In Situ) Chemical processing (i.e. Soil Shredding, Potassium Permanganate, etc.)	Not answered.
(In Situ) Biological processing (i.e. Microbes / Fertilizer, etc.)	Not answered.
(In Situ) Physical processing (i.e. Soil Washing, Gypsum, Disking, etc.)	Not answered.
Ground Water Abatement pursuant to 19.15.30 NMAC	Not answered.
OTHER (Non-listed remedial process)	Not answered.
<i>Per Subsection B of 19.15.29.11 NMAC unless the site characterization report includes completed efforts at remediation, the report must include a proposed remediation plan in accordance with 19.15.29.12 NMAC, which includes the anticipated timelines for beginning and completing the remediation.</i>	
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.	
I hereby agree and sign off to the above statement	Name: Samanntha Avarello Title: EHS Coordinator Email: savarello@txoenergy.com Date: 09/09/2025
<i>The OCD recognizes that proposed remediation measures may have to be minimally adjusted in accordance with the physical realities encountered during remediation. If the responsible party has any need to significantly deviate from the remediation plan proposed, then it should consult with the division to determine if another remediation plan submission is required.</i>	

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QUESTIONS, Page 5

Action 502794

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 502794
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Deferral Requests Only	
Only answer the questions in this group if seeking a deferral upon approval this submission. Each of the following items must be confirmed as part of any request for deferral of remediation.	
Requesting a deferral of the remediation closure due date with the approval of this submission	No

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1220 S. St Francis Dr.
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QUESTIONS, Page 6

Action 502794

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 502794
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	{Unavailable.}

Remediation Closure Request	
Only answer the questions in this group if seeking remediation closure for this release because all remediation steps have been completed.	
Requesting a remediation closure approval with this submission	No

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Phone: (505) 476-3441

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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 502794

CONDITIONS

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 502794
	Action Type: [C-141] Site Char./Remediation Plan C-141 (C-141-v-Plan)

CONDITIONS

Created By	Condition	Condition Date
rhamlet	The Remediation Plan is Conditionally Approved. Due to the sensitive nature of the release location and the site being within 1,000 ft of a fresh water well, the site will need to be remediated to the strictest closure criteria from Table 1 of the OCD Spill Rule. If any part of the release area is within 1,000 ft of a fresh water well, the entire release area will need to meet the strictest closure criteria standards from Table 1 of the OCD Spill Rule. Once the well site is plugged and abandoned and the site is considered "land no longer in use," reclamation standards must be met. The entire release area/area of concern will need to be reclaimed to reclamation standards set forth in the OCD Spill Rule.	10/21/2025
rhamlet	Please collect confirmation samples, representing no more than 200 ft ² . All samples must be analyzed for all constituents listed in Table I of 19.15.29.12 NMAC. Sidewall/edge samples should be delineated/excavated to 600 mg/kg for chlorides and 100 mg/kg for TPH to define the edge of the release. All sidewall samples should be taken from the sidewall of the excavation. Please make sure that the edge of the release extent is accurately defined. The work will need to be completed in 90 days after the report has been reviewed.	10/21/2025