

***** LIQUID SPILLS - VOLUME CALCULATIONS *****

Location of spill: VACUUM GLORIETTA WEST UNIT BATTERY (32.795451, -103.514161)

Date of Spill: 10/17/2023

Site Soil Type: KU —Kimbrough-Lea complex

Estimated Daily Production Loss: 15 BBL Oil 0 BBL Water

Total Area Calculations

Total Surface Area	width		length		wet soil depth	oil (%)
Rectangle Area #1	150.0 ft	X	36.0 ft	X	0.75 in	100%
Rectangle Area #2	ft	X	ft	X	in	0%
Rectangle Area #3	ft	X	ft	X	in	0%
Rectangle Area #4	ft	X	ft	X	in	0%
Rectangle Area #5	ft	X	ft	X	in	0%
Rectangle Area #6	ft	X	ft	X	in	0%
Rectangle Area #7	ft	X	ft	X	in	0%
Rectangle Area #8	ft	X	ft	X	in	0%

Porosity 0.250 gal per gal

Saturated Soil Volume Calculations:

		<u>H2O</u>	<u>OIL</u>
Area #1	5,400 sq. ft.	cu. ft.	337 cu. ft.
Area #2	0 sq. ft.	cu. ft.	cu. ft.
Area #3	0 sq. ft.	cu. ft.	cu. ft.
Area #4	0 sq. ft.	cu. ft.	cu. ft.
Area #5	0 sq. ft.	cu. ft.	cu. ft.
Area #6	0 sq. ft.	cu. ft.	cu. ft.
Area #7	0 sq. ft.	cu. ft.	cu. ft.
Area #8	0 sq. ft.	cu. ft.	cu. ft.
Total Solid/Liquid Volume:	5,400 sq. ft.	cu. ft.	337 cu. ft.

Estimated Volumes Spilled

	<u>H2O</u>	<u>OIL</u>
Liquid in Soil:	0.0 BBL	15.0 BBL
Liquid Recovered :	0.0 BBL	200.0 BBL
Spill Liquid	0.0 BBL	215.0 BBL
Total Spill Liquid:	215.0	

Recovered Volumes

Estimated oil recovered: 200.0 BBL
Estimated water recovered: 0.0 BBL

Soil Type	Porosity
Clay	0.15
Peat	0.40
Glacial Sediments	0.13
Sandy Clay	0.12
Silt	0.16
Loess	0.25
Fine Sand	0.16
Medium Sand	0.25
Coarse Sand	0.26
Gravely Sand	0.26
Fine Gravel	0.26
Medium Gravel	0.25
Coarse Gravel	0.18
Sandstone	0.25
Siltstone	0.18
Shale	0.05
Limestone	0.13
Basalt	0.19
Volcanic Tuff	0.20
Standing Liquids	

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	nAPP2329041721
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party	Morningstar Operating LLC	OGRID	330132
Contact Name	SAMANNTHA AVARELLO	Contact Telephone	817-334-7747
Contact email	SAVARELLO@TXOPARTNERS.COM	Incident # (assigned by OCD)	nAPP2329041721
Contact mailing address	400 W. 7th St. Fort Worth, TX 76102		

Location of Release Source

Latitude 32.79550 Longitude -103.51409
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	VACUUM GLORIETTA WEST UNIT BATTERY	Site Type	FACILITY
Date Release Discovered	10/17/2023	API# (if applicable)	FTO1424537321

Unit Letter	Section	Township	Range	County
C	36	17S	34E	Lea

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)

<input checked="" type="checkbox"/> Crude Oil	Volume Released (bbls) 215	Volume Recovered (bbls) 200
<input type="checkbox"/> Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	<input type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Condensate	Volume Released (bbls)	Volume Recovered (bbls)
<input type="checkbox"/> Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
<input type="checkbox"/> Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)

Cause of Release

UPSET FWKOS AND ALARM SYSTEM

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Was this a major release as defined by 19.15.29.7(A) NMAC? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If YES, for what reason(s) does the responsible party consider this a major release? >25 BBLs
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)? NOR SUBMITTED ONLINE	

Initial Response

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

<input checked="" type="checkbox"/> The source of the release has been stopped. <input checked="" type="checkbox"/> The impacted area has been secured to protect human health and the environment. <input checked="" type="checkbox"/> Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices. <input checked="" type="checkbox"/> All free liquids and recoverable materials have been removed and managed appropriately.	
If all the actions described above have <u>not</u> 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: SAMANNTHA AVARELLO	Title: EHS COORDINATOR
Signature: <u>Samanntha Avarello</u>	Date: 10/17/2023
email: SAVARELLO@TXOPARTNERS.COM	Telephone: 817-334-7747
<u>OCD Only</u>	
Received by: Shelly Wells	Date: 10/18/2023

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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.*

- ☒ A scaled site and sampling diagram as described in 19.15.29.11 NMAC
- ☒ 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)
- ☒ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)
- ☒ 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: Samanntha Avarello

Title: EHS Coordinator

Signature: Samanntha Avarello

Date: 01/22/2024

email: SAVARELLO@TXOPARTNERS.COM

Telephone: 817-334-7747

OCD Only

Received by: _____

Date: _____

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: _____

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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?	123' (ft bgs)
Did this release impact groundwater or surface water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within 300 feet of a wetland?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying a subsurface mine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release overlying an unstable area such as karst geology?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Are the lateral extents of the release within a 100-year floodplain?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Did the release impact areas not on an exploration, development, production, or storage site?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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.
<input checked="" type="checkbox"/> Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
<input type="checkbox"/> Field data
<input checked="" type="checkbox"/> Data table of soil contaminant concentration data
<input checked="" type="checkbox"/> Depth to water determination
<input checked="" type="checkbox"/> Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
<input checked="" type="checkbox"/> Boring or excavation logs
<input checked="" type="checkbox"/> Photographs including date and GIS information
<input checked="" type="checkbox"/> Topographic/Aerial maps
<input checked="" type="checkbox"/> 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.

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Printed Name: Samanntha Avarello Title: EHS Coordinator
Signature: Samanntha Avarello Date: 01/22/2024
email: SAVARELLO@TXOPARTNERS.COM Telephone: 817-334-7747

OCD Only

Received by: _____ Date: _____

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Remediation Plan

Remediation Plan Checklist: *Each of the following items must be included in the plan.*

- ☒ Detailed description of proposed remediation technique
- ☒ Scaled sitemap with GPS coordinates showing delineation points
- ☒ Estimated volume of material to be remediated
- ☒ Closure criteria is to Table 1 specifications subject to 19.15.29.12(C)(4) NMAC
- ☒ Proposed schedule for remediation (note if remediation plan timeline is more than 90 days OCD approval is required)

Deferral Requests Only: *Each of the following items must be confirmed as part of any request for deferral of remediation.*

- ☐ Contamination must be in areas immediately under or around production equipment where remediation could cause a major facility deconstruction.
- ☐ Extents of contamination must be fully delineated.
- ☐ Contamination does not cause an imminent risk to human health, the environment, or groundwater.

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Printed Name: Samanntha Avarello Title: EHS Coordinator
Signature: Samanntha Avarello Date: 01/22/2024
email: SAVARELLO@TXOPARTNERS.COM Telephone: 817-334-7747

OCD Only

Received by: _____ Date: _____

☐ Approved ☐ Approved with Attached Conditions of Approval ☐ Denied ☐ Deferral Approved

Signature: _____ Date: _____

Trinity Oilfield Services & Rentals, LLC



January 22nd, 2024

Oil Conservation Division, District I
1625 N. French Drive
Hobbs, NM 88240

Re: **Closure Request**
Vacuum Glorietta West Unit Battery
Tracking #: NAPP2329041721

Trinity Oilfield Services (Trinity), on behalf of MorningStar Operating LLC, hereby submits the following Closure Request in response to a release that occurred at the above-referenced location, and further described below.

Site Information	
Incident ID	NAPP2329041721
Site Name	Vacuum Glorietta West Unit Battery
Company	MorningStar Operating LLC
County	Lea
ULSTR	C-36-17S-34E
GPS Coordinates (NAD 83)	32.795451, -103.514161
Landowner	State

RELEASE BACKGROUND

On 10/17/2023, MorningStar Operating LLC reported a release at the Vacuum Glorietta West Unit Battery. The release was caused by an upset FWKOS and alarm system. Approximately 5,392 sqft. of the Pad was found to be damp upon initial inspection.

Release Information	
Date of Release	10/17/2023
Type of Release	Crude Oil
Source of Release	Equipment Failure
Volume Released – Produced Water	0 bbls
Volume Recovered – Produced Water	0 bbls
Volume Released – Crude Oil	215 bbls
Volume Recovered – Crude Oil	200 bbls
Affected Area – Damp Soil	Pad - Approximately 5,392 sqft.
Site Location Map	Attached

SITE CHARACTERIZATION AND CLOSURE CRITERIA**Depth to Groundwater/Wellhead Protection:**

Data Source	Well Number	Data Date	Depth (ft.)
NM OSE	L-14180 POD 1	10/17/2026	126'
NM OSE	L-14180 POD 2	10/17/2026	126'
USGS	324737103301401	3/8/2001	123.20'

A search of the groundwater well databases maintained by the New Mexico Office of the State Engineer (NMOSE) and the United States Geological Survey (USGS) was conducted to determine if any registered groundwater wells are located within a $\frac{1}{2}$ mile of the release site. The search revealed that Three (3) wells occurred in the databases that meet the NMOCD criteria for the age of data, the distance of the data point well from the release point, and a data point well having a diagram of construction.

General Site Characterization:

Site Assessment	
Karst Potential	Low
Distance to Watercourse	> 1,000 ft.
Within 100 yr Floodplain	No
Pasture Impact	No

A risk-based site assessment/characterization was performed following the New Mexico Oil Conservation Division (NMOCD) Rule (Title 19 Chapter 15 Part 29) for releases on oil and gas development and production in New Mexico (effective August 14, 2018). To summarize the site assessment/characterization evaluation, the affected area has Low potential for cave and karst, and no other receptors (residence, school, hospital, institution, church, mining, municipal, or other ordinance boundaries) were located within the regulatorily promulgated distances from the site.

Soil Assessment	
Soil Series	Kimbrough-Lea
Fragile Soil Interpretive Class	Fragile
Erodibility Value	0.32
Wind Erodibility Group	5
Badland Soils	No
Gypsum Soils	No
Representative Slope	1%
Depth to Restrictive Feature	25 cm
Depth to Bedrock	>200 cm
Severe Wildland Burn	No

A soil assessment/characterization was performed following the New Mexico State Land Office Environmental Compliance Office (ECO) Spill and Release Reporting Guidelines (Part 2 Letter D). To summarize, the affected area is classified as a sensitive soil.

Closure Criteria:

On-Site & Off-Site 4ft bgs Recommended Remedial Action Levels (RRALs)	
Chlorides	20,000 mg/kg
TPH (GRO and DRO and MRO)	2,500 mg/kg
TPH (GRO and DRO)	1,000 mg/kg
BTEX	50 mg/kg
Benzene	10 mg/kg

A reclamation standard of 600 mg/kg chloride and 100 mg/kg TPH was applied to the top four feet of the pasture area if impacted by the release, per NMAC 19.15.29.13.D (1) for the top four feet of areas that will be reclaimed following remediation.

INITIAL ASSESSMENT AND REMEDIATION ACTIVITIES**Initial Sample Activities:**

Delineation Summary	
Delineation Dates	12/13/2023
Depths Sampled	0' - 1'
Delineation Map	Attached
Laboratory Results	Table 1

All soil samples were placed into laboratory-supplied glassware, labeled, and maintained on ice until delivery to an NMOCD-approved laboratory (Cardinal Laboratories of Hobbs, NM) for the analysis of chloride using Method SM4500 Cl-B, Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method 8021 B and Total Petroleum Hydrocarbon (TPH) constituents the by EPA 8015M.

Confirmation Activities:

Remediation Summary	
Remediation Dates	Not Required
Workplan Approval	Not Required
Liner Variance Request	Not Required
Deferral Request	Not Required
Depths Excavated	Not Required
Area Represented by the required 5-point Confirmation Samples – Floors and Walls	Not Required
Total Volume of Excavated Soil	Not Required
Remediation Map	Not Required
Laboratory Results	Not Required

Laboratory results for Delineation Samples indicated that impacted soils were under the required Chloride, Benzene, BTEX, and TPH concentrations per NMOCD Closure Criteria listed in the Table above.

REQUEST FOR CONFIRMATION SAMPLE NOTIFICATION VARIANCE

Trinity, on behalf of MorningStar Operating LLC, kindly requests a variance per the requirements of 19.15.29.12 D.(1)(a) for the utilization of delineation samples for remediation closure. A proper two-day notice to the OCD was not dispatched as referenced in VIII.B. of the Frequently Asked Questions section of Public Notice Implementation of Digital C-141 and Incident Statuses. While field test results found delineation samples to be under closure criteria for chloride concentrations, it was not possible to accurately determine TPH levels in-situ. Delineation samples were determined to be below remediation closure standards for both chloride and TPH concentrations after documented laboratory data was received. Laboratory data is within closure criteria limits and the current condition of the release area does not cause an imminent risk to human health, the environment, or groundwater.

REQUEST FOR CLOSURE

Supporting Documentation	
C-141 page 6	Signed and Attached
Delineation Map	Attached
Depth to Groundwater Maps and Source	Attached
US NWI Map	Attached
FEMA Flood Hazard Map	Attached
USDA Soil Survey	Attached
Site Photography	Attached
Laboratory Analytics with COCs	Attached

Through delineation activities, this site has been found to meet the standards of Table I of 19.15.29.12 NMAC; therefore, does not require further remediation activities. Trinity Oilfield Services respectfully requests that the New Mexico Oil Conservation Division grant closure approval for the referenced release.

Final reclamation of the well pad shall take place in accordance with 19.15.29.13 NMAC once the site is no longer being used for oil and gas operations.

Sincerely,

Dan Dunkelberg

Dan Dunkelberg
Project Manager

Cynthia Jordan

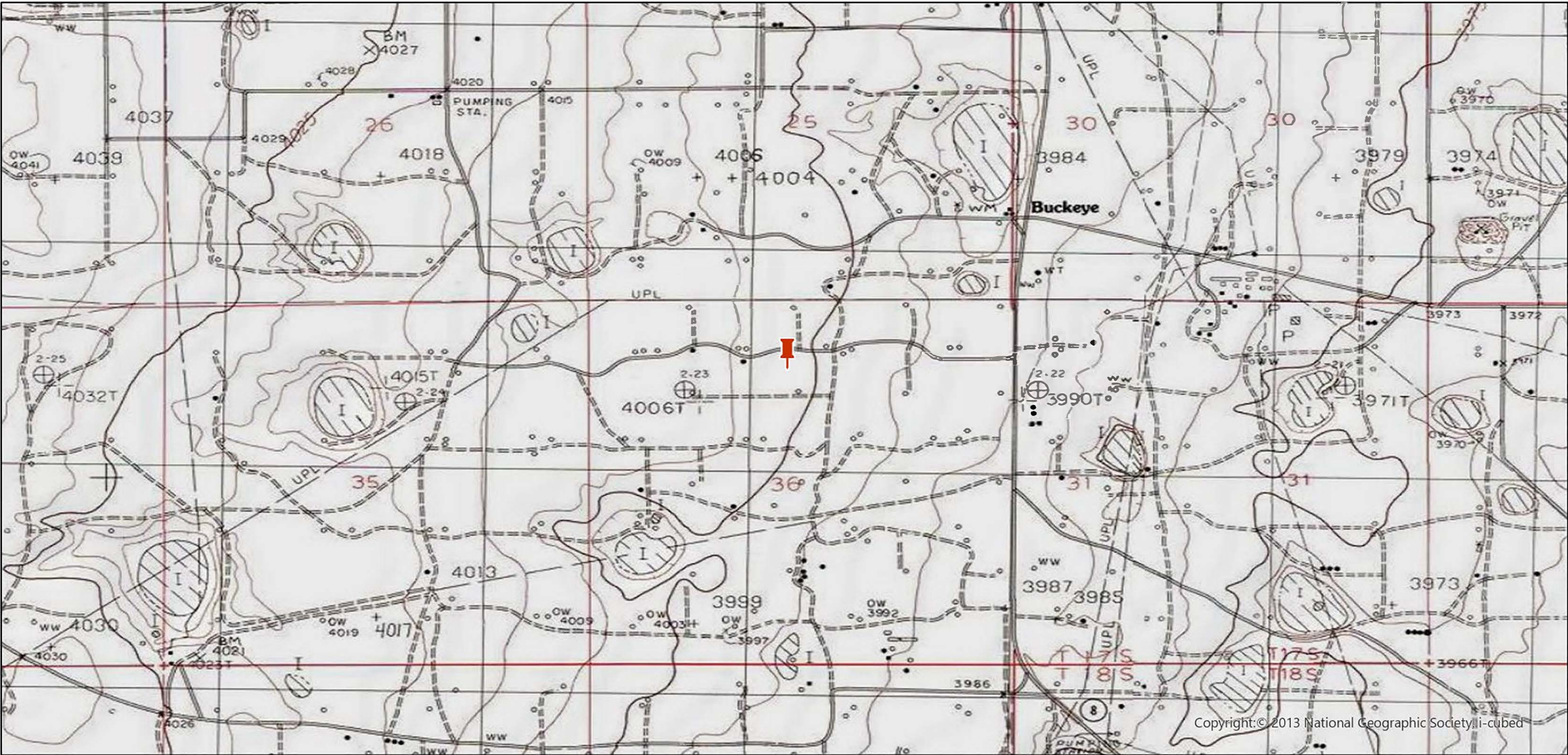
Cynthia Jordan
Project Scientist

TABLE 1
CONCENTRATIONS OF BENZENE, BTEX, TPH & CHLORIDE IN SOIL

MORNINGSTAR OPERATING LLC
VACUUM GLORIETTA WEST UNIT BATTERY
LEA COUNTY, NEW MEXICO
NMOCD REFERENCE #: NAPP2329041721



SAMPLE LOCATION	SAMPLE DEPTH (BGS)	SAMPLE DATE	VERTICAL/ HORIZONTAL	OFF-SITE/ ON-SITE	SAMPLE TYPE	SOIL STATUS	CHLORIDE (mg/Kg)	TPH C6-C36 (mg/Kg)	GRO+ DRO (mg/kg)	GRO C6-C10 (mg/Kg)	DRO C10-C28 (mg/Kg)	MRO C28-C36 (mg/Kg)	TOTAL BTEX (mg/Kg)	BENZENE (mg/Kg)
On-Site, & Deeper than 4' Pasture							20000	2500	1000	NE	NE	NE	50	10
Delineation Special Circumstance, NMOCD Delineation Limits Pasture to 4'							600	100	NE	NE	NE	NE	50	10
Vertical Delineation														
DV-001.0-00.0-S	0	12/13/2023	Vertical	On-Site	Grab	In-Situ	1460	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DV-001.0-01.0-S	1	12/13/2023	Vertical	On-Site	Grab	In-Situ	1650	18.6	18.6	<10.0	18.6	<10.0	<10.0	<10.0
DV-002.0-00.0-S	0	12/13/2023	Vertical	On-Site	Grab	In-Situ	160	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DV-003.0-00.0-S	0	12/13/2023	Vertical	On-Site	Grab	In-Situ	432	141.6	122	<10.0	122	19.6	<10.0	<10.0
Horizontal Delineation														
DH-001.0-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	1,470	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-001.1-01.0-P	1	12/13/2023	Horizontal	Off-Site	Grab	In-Situ	272	10.90	10.90	<10.0	10.90	<10.0	<10.0	<10.0
DH-002.0-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	2,040	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-002.4-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	352	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-003.0-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	672	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-003.1-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	1,740	29.50	29.50	<10.0	29.50	<10.0	<10.0	<10.0
DH-003.3-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	32	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-004.0-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	1,460	368.10	312.00	<10.0	312.00	56.10	<10.0	<10.0
DH-004.1-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	288	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-005.0-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	736	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-005.1-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	224	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-006.0-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	224	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
DH-007.0-01.0-S	1	12/13/2023	Horizontal	On-Site	Grab	In-Situ	256	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0



Legend:

 Site Location

Site Location Map
MorningStar Operating LLC
Vacuum Glorieta West Unit Battery
32.795451, -103.514161
Lea County, New Mexico
NMOCD Reference # NAPP2329041721

0 0.25 0.5 1 Miles

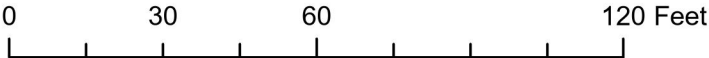




Legend:

- Horizontal Delineation
- Vertical Delineation
- Release Area

Delineation Map
MorningStar Operating LLC
Vacuum Glorietta West Unit Battery
32.795451, -103.514161
Lea County, New Mexico
NMOCD Reference # NAPP2329041721





Initial Release

Pad:

West Elevation

☉ 97°E (T) LAT: 32.796235 LON: -103.514877 ±9ft ▲ 4007ft



Pad:

North West Elevation

☉ 136°SE (T) LAT: 32.796301 LON: -103.514747 ±9ft ▲ 4006ft





Initial Release

Pad:

North East Elevation

☉ 239°SW (T) LAT: 32.796277 LON: -103.514380 ±9ft ▲ 4006ft



12 Dec 2023, 15:14:01

Pad:

East Elevation

☉ 254°W (T) LAT: 32.796271 LON: -103.514138 ±9ft ▲ 4007ft



12 Dec 2023, 15:14:25



Initial Release

Pad:




Pad:





New Mexico Office of the State Engineer

Point of Diversion Summary

		(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest)						(NAD83 UTM in meters)			
Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y		
L	14180 POD1	4	2	2	36	17S	34E	639756	3629715 		
Driller License:		1731		Driller Company:		HARRISON & COOPER, INC DBA: HCI DRILLING					
Driller Name:		COOPER, KENNY									
Drill Start Date:		09/20/2016		Drill Finish Date:		09/20/2016		Plug Date:			
Log File Date:		10/17/2016		PCW Rev Date:				Source: Shallow			
Pump Type:				Pipe Discharge Size:				Estimated Yield: 55 GPM			
Casing Size:		4.00		Depth Well:		231 feet		Depth Water: 126 feet			
		Casing Perforations:									
Top				Bottom							
92				231							

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

11/30/23 1:55 PM

POINT OF DIVERSION SUMMARY



WELL RECORD & LOG

OFFICE OF THE STATE ENGINEER

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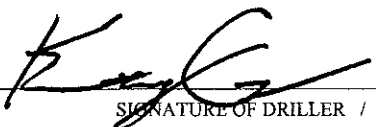
2016 OCT 17 PM 1:59
STATE ENGINEER'S OFFICE
ROSSELL, NEW MEXICO

1. GENERAL AND WELL LOCATION	OSE POD NUMBER (WELL NUMBER) L-14180-POD 1 (VGWU 61-MW1)				OSE FILE NUMBER(S) L-14180			
	WELL OWNER NAME(S) ARCADIS on behalf of Chevron EMC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 2929 Briarpark Drive, Suite 300				CITY Houston		STATE TX	
	WELL LOCATION (FROM GPS)				DEGREES 32		MINUTES 47	
	LATITUDE		32		47		47.48 N	
	LONGITUDE		103		30		26.73 W	
* ACCURACY REQUIRED: ONE TENTH OF A SECOND								
* DATUM REQUIRED: WGS 84								
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE								
2. DRILLING & CASING INFORMATION	LICENSE NUMBER 1731		NAME OF LICENSED DRILLER Kenny Cooper				NAME OF WELL DRILLING COMPANY Harrison & Cooper, Inc (DBA HCI Drilling)	
	DRILLING STARTED 09/20/16		DRILLING ENDED 09/20/16		DEPTH OF COMPLETED WELL (FT) 231'		BORE HOLE DEPTH (FT) 234'	
	COMPLETED WELL IS: <input type="checkbox"/> ARTESIAN <input type="checkbox"/> DRY HOLE <input checked="" type="checkbox"/> SHALLOW (UNCONFINED)						DEPTH WATER FIRST ENCOUNTERED (FT) 126.15'	
	DRILLING FLUID: <input type="checkbox"/> AIR <input checked="" type="checkbox"/> MUD ADDITIVES - SPECIFY:							
	DRILLING METHOD: <input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> OTHER - SPECIFY:							
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)		CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)		CASING CONNECTION TYPE	
	FROM	TO						
	0	92	7.875		Riser-PVC		FlushJoint	
	92	231	7.875		Screen-PVC		FlushJoint	
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)		LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL		AMOUNT (cubic feet)	
	FROM	TO						
	0	85	7.875		Neat Cement Grout		~16	
	85	89	7.875		Bentonite Chips		~1.5	
	89	234	7.875		Sand-8/16		~36	

FOR OSE INTERNAL USE: 1308107				WR-20 WELL RECORD & LOG (Version 10/29/15)			
FILE NUMBER		L-14180		POD NUMBER		1	
LOCATION		15.34E.36.2.2.4		TRN NUMBER		591768	
STATE ENGINEER'S OFFICE						PAGE 1 OF 2	

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	15	15	Caliche	Y N	
	15	25	10	Caliche with Tan Sand	Y N	
	25	54	29	White Sandy Caliche	Y N	
	54	54.5	.5	Sandstone	Y N	
	54.5	62	7.5	Sandy Caliche	Y N	
	62	90	28	Red Brown Sand	Y N	
	90	110	20	Pale Brown Cemented Sand	Y N	
	110	122	12	Light Brown Sand	Y N	
	122	138	16	Sandy Brown Clay	Y N	
	138	141	3	Red Brown Sandy Clay	Y N	
	141	143	3	Tan Sand and Caliche	Y N	
	143	160	17	Brown Sand	Y N	
	160	180	20	Sand with Small Gravels	Y N	
	180	200	20	Brown Sand	Y N	
	200	210	10	Light Brown Sand	Y N	
	210	218	8	Light Brown Sandy Clay	Y N	
	218	230	9	Large Gravels with Light Brown Sand	Y N	
	230	234	4	Red Bed	Y N	
					Y N	
					Y N	
					Y N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA: <input checked="" type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:					TOTAL ESTIMATED WELL YIELD (gpm): 55	

5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.
	MISCELLANEOUS INFORMATION: Pumping water level 132.90'	
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE: Jarod Michalsky	

6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:	
	 SIGNATURE OF DRILLER / PRINT SIGNED NAME	Kenny Cooper DATE 10/06/16

FOR OSE INTERNAL USE: 114180		WR-20 WELL RECORD & LOG (Version 10/29/2015)	
FILE NUMBER	114180	POD NUMBER	1
LOCATION	17S.034E.36.2.4	TRN NUMBER	591768
		MONITOR	PAGE 2 OF 2



New Mexico Office of the State Engineer

Point of Diversion Summary

		(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest)						(NAD83 UTM in meters)	
Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
L	14180 POD2	4	2	2	36	17S	34E	639781	3629735
<div><div>Driller License: 1731</div><div>Driller Company: HARRISON & COOPER, INC DBA: HCI DRILLING</div><div>Driller Name: COOPER, KENNY</div><div>Drill Start Date: 09/19/2016</div><div>Drill Finish Date: 09/20/2016</div><div>Plug Date:</div><div>Log File Date: 10/17/2016</div><div>PCW Rcv Date:</div><div>Source: Shallow</div><div>Pump Type:</div><div>Pipe Discharge Size:</div><div>Estimated Yield: 55 GPM</div><div>Casing Size: 4.00</div><div>Depth Well: 233 feet</div><div>Depth Water: 126 feet</div></div>									
<div><div>Casing Perforations:</div><div>Top Bottom</div><div>73 233</div></div>									

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11/30/23 1:55 PM

POINT OF DIVERSION SUMMARY



WELL RECORD & LOG


OFFICE OF THE STATE ENGINEER

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2016 OCT 17 PM 1:59
STATE ENGINEER OFFICE
ROSSELL, NEW MEXICO

1. GENERAL AND WELL LOCATION	OSE POD NUMBER (WELL NUMBER) L-14180-POD 2 (VGWU 61-MW2)				OSE FILE NUMBER(S) L-14180			
	WELL OWNER NAME(S) ARCADIS on behalf of Chevron EMC				PHONE (OPTIONAL)			
	WELL OWNER MAILING ADDRESS 2929 Briarpark Drive, Suite 300				CITY Houston		STATE TX	ZIP 77042
	WELL LOCATION (FROM GPS)	DEGREES LATITUDE 32		MINUTES 47	SECONDS 48.10	N	* ACCURACY REQUIRED: ONE TENTH OF A SECOND	
		LONGITUDE 103		30	25.76	W	* DATUM REQUIRED: WGS 84	
DESCRIPTION RELATING WELL LOCATION TO STREET ADDRESS AND COMMON LANDMARKS - PLSS (SECTION, TOWNSHIP, RANGE) WHERE AVAILABLE								
2. DRILLING & CASING INFORMATION	LICENSE NUMBER 1731		NAME OF LICENSED DRILLER Kenny Cooper			NAME OF WELL DRILLING COMPANY Harrison & Cooper, Inc (DBA HCI Drilling)		
	DRILLING STARTED 09/19/16		DRILLING ENDED 09/20/16		DEPTH OF COMPLETED WELL (FT) 233'		BORE HOLE DEPTH (FT) 235'	
	COMPLETED WELL IS:		<input type="checkbox"/> ARTESIAN <input type="checkbox"/> DRY HOLE <input checked="" type="checkbox"/> SHALLOW (UNCONFINED)				DEPTH WATER FIRST ENCOUNTERED (FT) 125.95'	
	DRILLING FLUID:		<input type="checkbox"/> AIR <input checked="" type="checkbox"/> MUD ADDITIVES - SPECIFY:					
	DRILLING METHOD:		<input checked="" type="checkbox"/> ROTARY <input type="checkbox"/> HAMMER <input type="checkbox"/> CABLE TOOL <input type="checkbox"/> OTHER - SPECIFY:					
	DEPTH (feet bgl)		BORE HOLE DIAM (inches)	CASING MATERIAL AND/OR GRADE (include each casing string, and note sections of screen)	CASING CONNECTION TYPE	CASING INSIDE DIAM. (inches)	CASING WALL THICKNESS (inches)	SLOT SIZE (inches)
	FROM	TO						
	0	73	7.875	Riser-PVC	FlushJoint	4"	Sch40	
	73	233	7.875	Screen-PVC	FlushJoint	4"	Sch40	0.010
3. ANNULAR MATERIAL	DEPTH (feet bgl)		BORE HOLE DIAM. (inches)	LIST ANNULAR SEAL MATERIAL AND GRAVEL PACK SIZE-RANGE BY INTERVAL	AMOUNT (cubic feet)	METHOD OF PLACEMENT		
	FROM	TO						
	0	65	7.875	Neat Cement Grout	~11	Mixed/Poured		
	65	70	7.875	Bentonite Chips	~1.5	Poured		
	70	235	7.875	Sand-8/16	~37	Poured		

FOR OSE INTERNAL USE ONLY				WR-20 WELL RECORD & LOG (Version 10/29/15)			
FILE NUMBER L-14180		POD NUMBER 2		TRN NUMBER 591768		PAGE 1 OF 2	
LOCATION 1775 34th St. 2.2.4				monitor			

4. HYDROGEOLOGIC LOG OF WELL	DEPTH (feet bgl)		THICKNESS (feet)	COLOR AND TYPE OF MATERIAL ENCOUNTERED - INCLUDE WATER-BEARING CAVITIES OR FRACTURE ZONES (attach supplemental sheets to fully describe all units)	WATER BEARING? (YES / NO)	ESTIMATED YIELD FOR WATER- BEARING ZONES (gpm)
	FROM	TO				
	0	15	15	Caliche	Y N	
	15	25	10	Caliche with Tan Sand	Y N	
	25	54	29	White Sandy Caliche	Y N	
	54	54.5	.5	Sandstone	Y N	
	54.5	62	7.5	Sandy Caliche	Y N	
	62	90	28	Red Brown Sand	Y N	
	90	110	20	Pale Brown Cemented Sand	Y N	
	110	122	12	Light Brown Sand	Y N	
	122	138	16	Sandy Brown Clay	Y N	
	138	141	3	Red Brown Sandy Clay	Y N	
	141	143	3	Tan Sand and Caliche	Y N	
	143	160	17	Brown Sand	Y N	
	160	180	20	Sand with Small Gravels	Y N	
	180	200	20	Brown Sand	Y N	
	200	210	10	Light Brown Sand	Y N	
	210	218	8	Light Brown Sandy Clay	Y N	
	218	234	9	Large Gravels with Light Brown Sand	Y N	
	234	235	1	Red Bed	Y N	
					Y N	
					Y N	
					Y N	
METHOD USED TO ESTIMATE YIELD OF WATER-BEARING STRATA:					TOTAL ESTIMATED WELL YIELD (gpm): 55	
<input checked="" type="checkbox"/> PUMP <input type="checkbox"/> AIR LIFT <input type="checkbox"/> BAILER <input type="checkbox"/> OTHER - SPECIFY:						
5. TEST; RIG SUPERVISION	WELL TEST	TEST RESULTS - ATTACH A COPY OF DATA COLLECTED DURING WELL TESTING, INCLUDING DISCHARGE METHOD, START TIME, END TIME, AND A TABLE SHOWING DISCHARGE AND DRAWDOWN OVER THE TESTING PERIOD.				
	MISCELLANEOUS INFORMATION: Pumping water level 133.17'					
	PRINT NAME(S) OF DRILL RIG SUPERVISOR(S) THAT PROVIDED ONSITE SUPERVISION OF WELL CONSTRUCTION OTHER THAN LICENSEE: Jarod Michalsky					
6. SIGNATURE	THE UNDERSIGNED HEREBY CERTIFIES THAT, TO THE BEST OF HIS OR HER KNOWLEDGE AND BELIEF, THE FOREGOING IS A TRUE AND CORRECT RECORD OF THE ABOVE DESCRIBED HOLE AND THAT HE OR SHE WILL FILE THIS WELL RECORD WITH THE STATE ENGINEER AND THE PERMIT HOLDER WITHIN 20 DAYS AFTER COMPLETION OF WELL DRILLING:  Kenny Cooper 10/06/16 SIGNATURE OF DRILLER / PRINT SIGNEE NAME DATE					

FOR USE INTERIOR USE

WR-20 WELL RECORD & LOG (Version 10/29/2015)

FILE NUMBER	66-1-114180	POD NUMBER	2	TRN NUMBER	591768
LOCATION	MIS-34E-36.2.2.4			Monitor	PAGE 2 OF 2



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Data Category:


Groundwater

Geographic Area:

United States

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Groundwater levels for the Nation

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Agency code = usgs
site_no list =

- 324737103301401

Minimum number of levels = 1
[Save file of selected sites](#) to local disk for future upload

USGS 324737103301401 17S.34E.36.224112

Lea County, New Mexico
Latitude 32°47'48", Longitude 103°30'24" NAD27
Land-surface elevation 3,993.00 feet above NGVD29
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
1961-02-15			D 62610		3915.21	NGVD29	1	Z		
1961-02-15			D 62611		3916.73	NAVD88	1	Z		
1961-02-15			D 72019	77.79			1	Z		
1966-03-16			D 62610		3913.56	NGVD29	1	Z		
1966-03-16			D 62611		3915.08	NAVD88	1	Z		
1966-03-16			D 72019	79.44			1	Z		
1971-02-17			D 62610		3911.42	NGVD29	1	Z		
1971-02-17			D 62611		3912.94	NAVD88	1	Z		
1971-02-17			D 72019	81.58			1	Z		
1976-02-20			D 62610		3906.52	NGVD29	1	Z		
1976-02-20			D 62611		3908.04	NAVD88	1	Z		
1976-02-20			D 72019	86.48			1	Z		
1981-01-23			D 62610		3893.45	NGVD29	1	Z		
1981-01-23			D 62611		3894.97	NAVD88	1	Z		
1981-01-23			D 72019	99.55			1	Z		
1986-04-01			D 62610		3885.60	NGVD29	1	Z		
1986-04-01			D 62611		3887.12	NAVD88	1	Z		

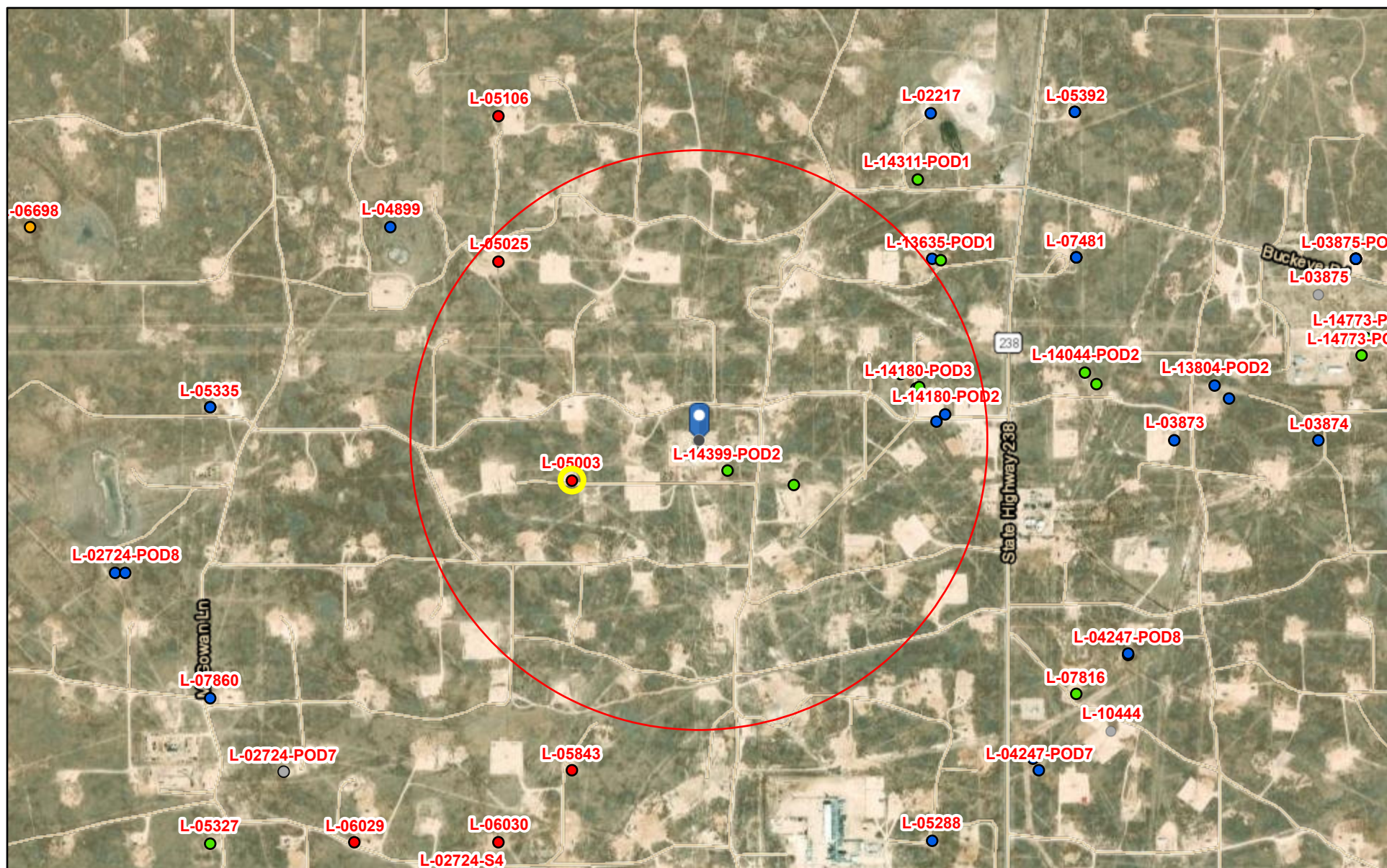
Date	Time	Water-level date-time accuracy	Parameter code	Water level, feet below land surface	Water level, feet above specific vertical datum	Referenced vertical datum	Status	Method of measurement	Measuring agency	Source of measurement
1986-04-01			D	72019	107.40		1	Z		
1991-01-15			D	62610		3880.94	NGVD29	1	Z	
1991-01-15			D	62611		3882.46	NAVD88	1	Z	
1991-01-15			D	72019	112.06		1	Z		
1996-02-08			D	62610		3871.99	NGVD29	1	S	
1996-02-08			D	62611		3873.51	NAVD88	1	S	
1996-02-08			D	72019	121.01		1	S		
2001-03-08			D	62610		3869.80	NGVD29	1	S	
2001-03-08			D	62611		3871.32	NAVD88	1	S	
2001-03-08			D	72019	123.20		1	S		

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
Method of measurement	S	Steel-tape measurement.
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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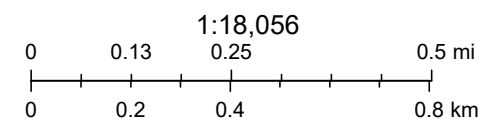
NAPP2329041721 | VACUUM GLORIETTA WEST UNIT BATTERY



11/30/2023, 1:26:52 PM

GIS WATERS PODs

- Active
- Pending
- Inactive
- Capped
- Plugged

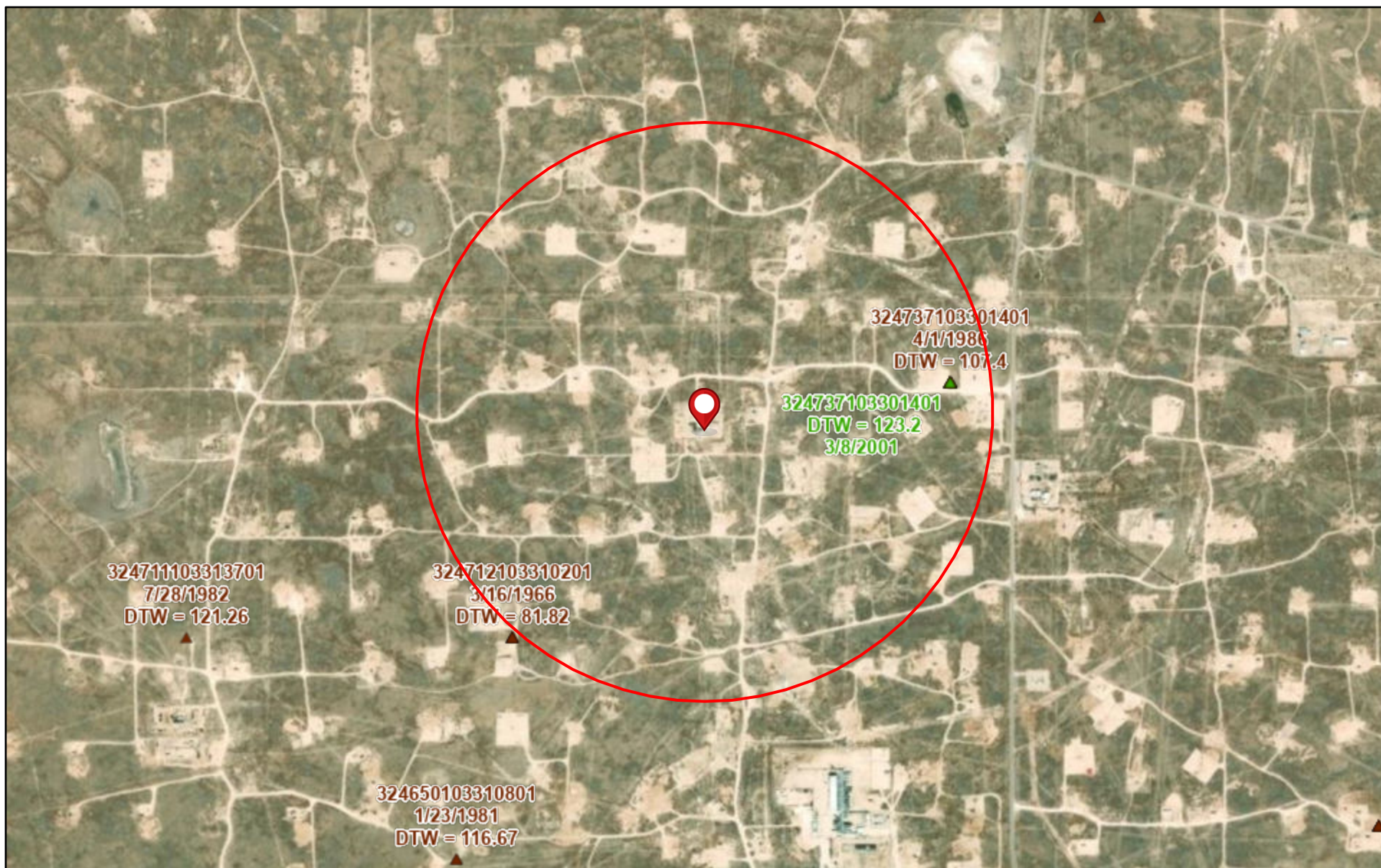


Esri, HERE, iPC, Esri, HERE, Garmin, iPC, Maxar

Online web user

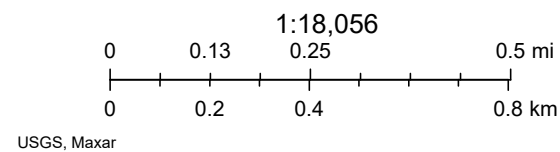
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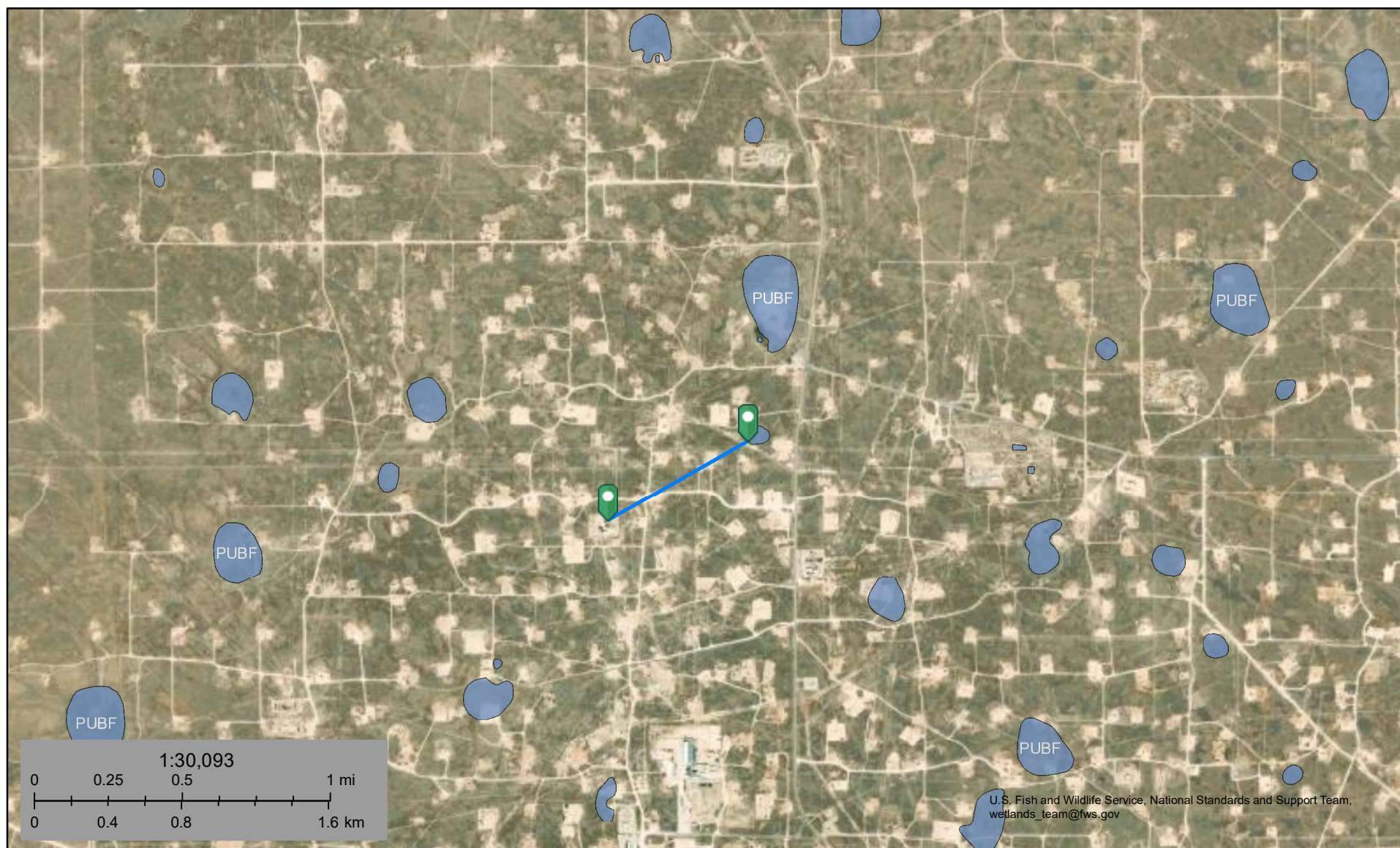
NAPP2329041721 | VACUUM GLORIETTA WEST UNIT BATTERY



11/30/2023, 1:38:40 PM

- ▲ USGS Historical GW Wells
- ▲ USGS Active Monitoring GW Wells








November 30, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland

-  Freshwater Emergent Wetland
 Freshwater Forested/Shrub Wetland
 Freshwater Pond

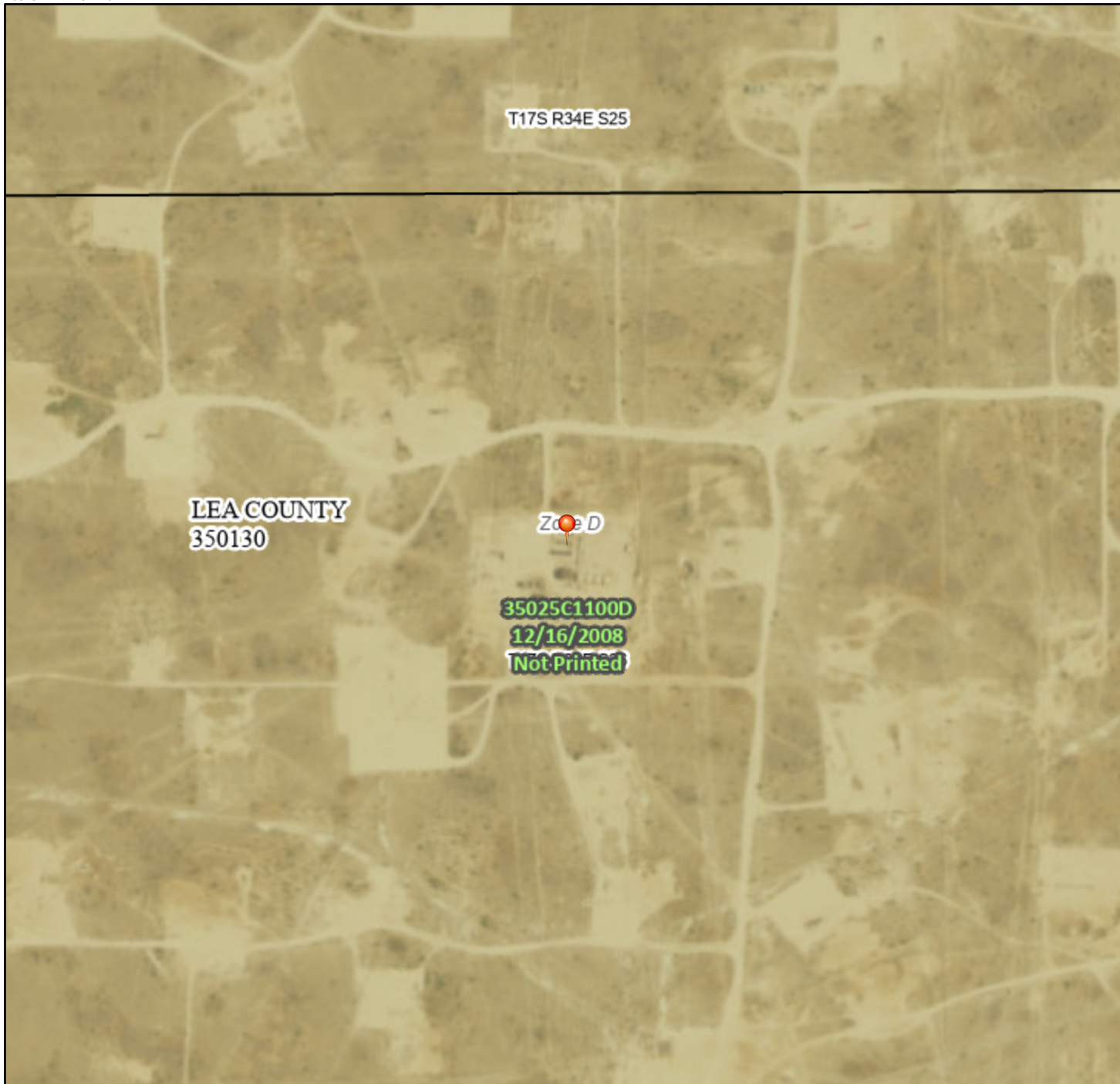
-  Lake
 Other
 Riverine

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.

National Flood Hazard Layer FIRMMette



103°31'11"W 32°48'1"N



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

1:6,000
























103°30'33"W 32°47'31"N

Released to Imaging: 4/25/2024 12:49:34 PM

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
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
OTHER FEATURES		Coastal Transect
		Base Flood Elevation Line (BFE)
OTHER FEATURES		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
MAP PANELS		Hydrographic Feature
		Digital Data Available
MAP PANELS		No Digital Data Available
		Unmapped



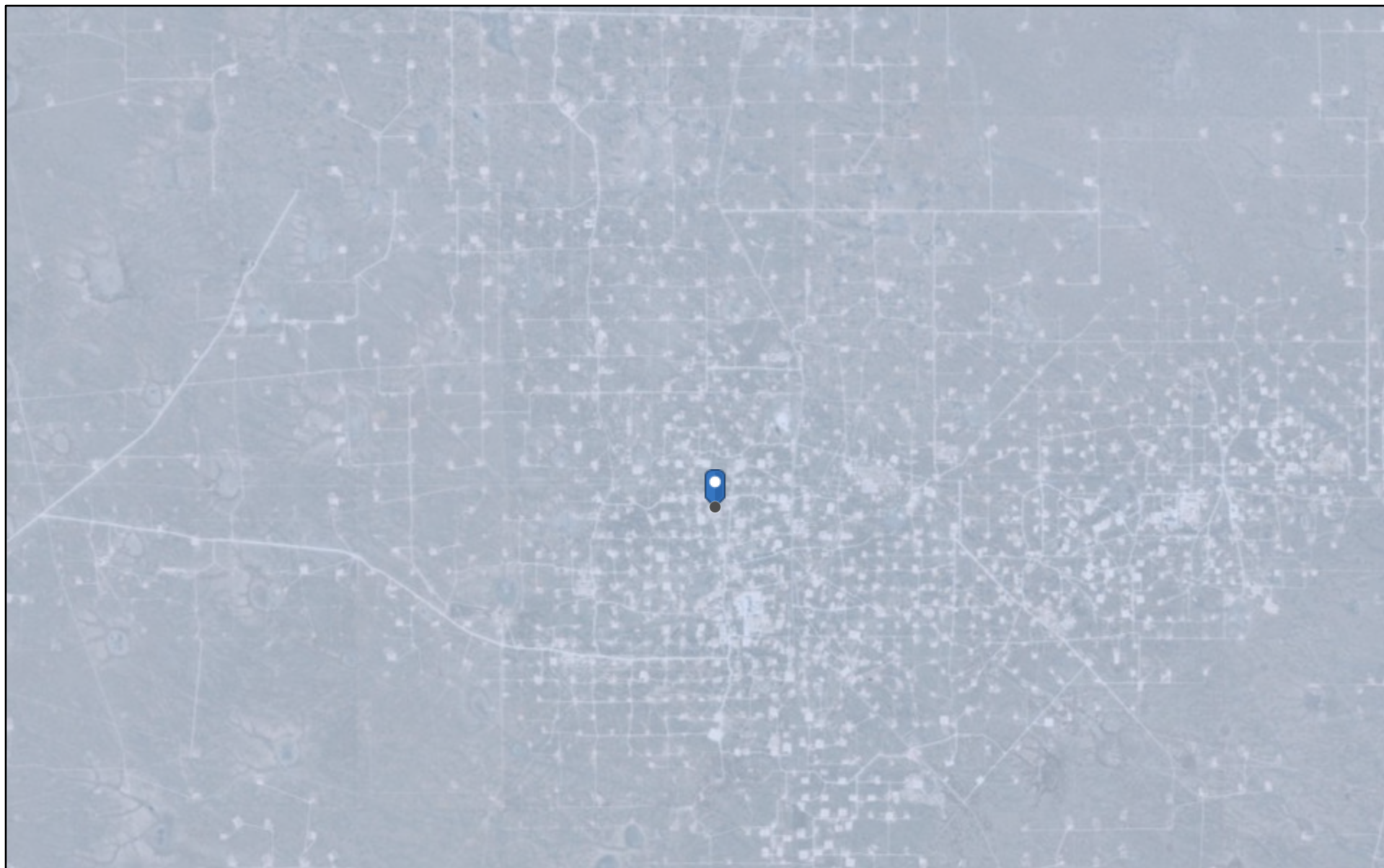
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

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 **11/30/2023 at 3:42 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.

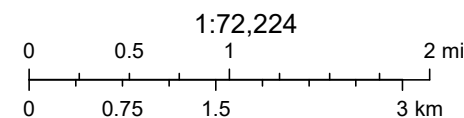
NAPP2329041721 | VACUUM GLORIETTA WEST UNIT BATTERY



11/30/2023, 1:39:55 PM

Karst Occurrence Potential

Low



BLM, OCD, New Mexico Tech, Earthstar Geographics



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 **Lea County, New Mexico**

**NAPP2329041721 | VACUUM
GLORIETTA WEST UNIT
BATTERY**



January 16, 2024

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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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

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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

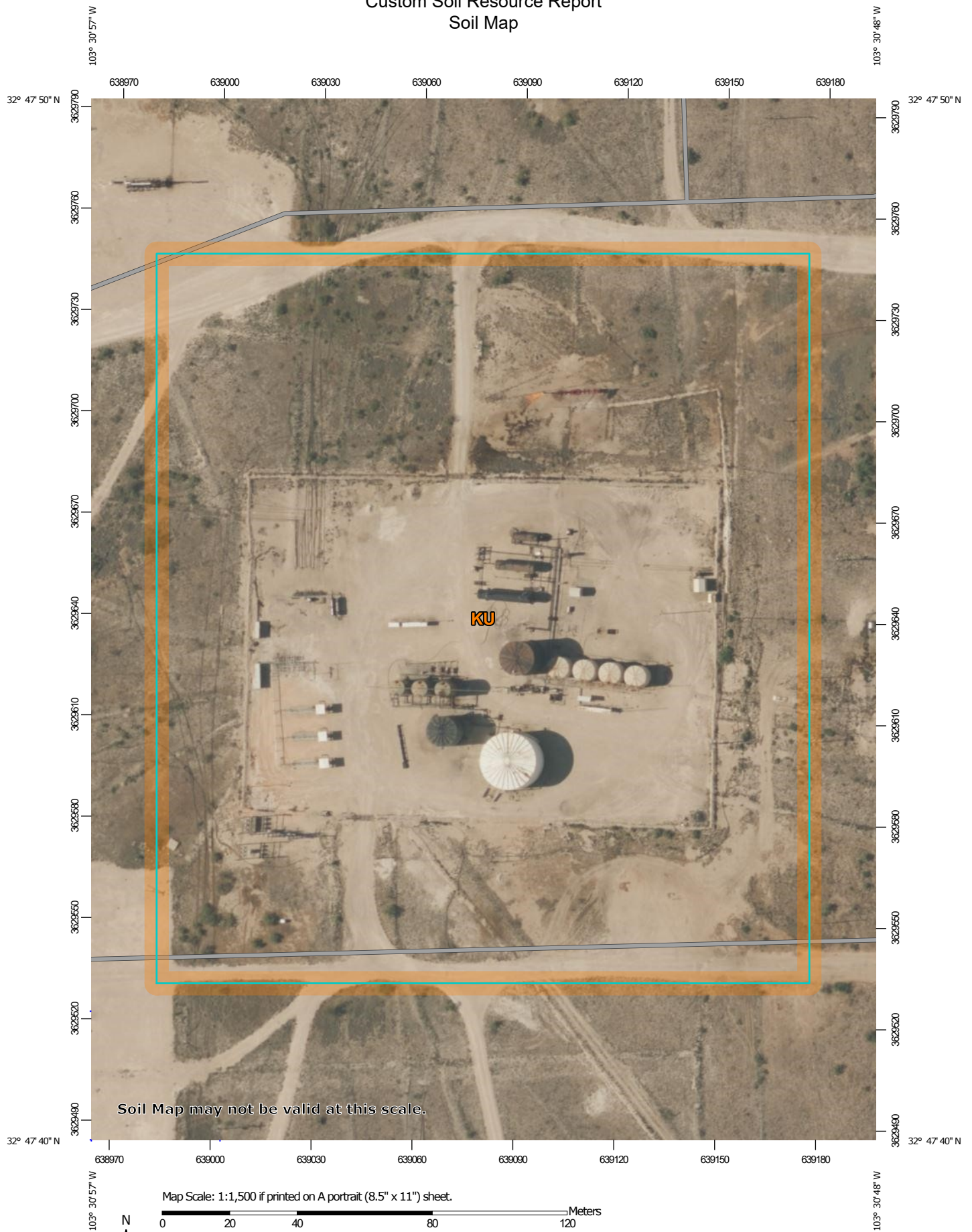
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identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

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.


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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 20, Sep 6, 2023

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.

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Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	10.4	100.0%
Totals for Area of Interest		10.4	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.

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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.

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

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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**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

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

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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

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Soil Health

Soil health interpretations are designed to be used as tools for evaluating and managing a soil's capacity to function as a vital living ecosystem that sustains plants, animals, and humans. Example interpretations include compaction, surface sealing, carbon sequestration, resistance and resilience, management systems and practices, and cover crops.

Fragile Soil Index

SOH - Soil Health

Soils can be rated based on their susceptibility to degradation in the "Fragile Soil Index" interpretation. Fragile soils are those that are most vulnerable to degradation. In other words, they can be easily degraded they have a low resistance to degradation processes. They tend to be highly susceptible to erosion and can have a low capacity to recover after degradation has occurred (low resilience). Fragile soils are generally characterized by a low content of organic matter, low aggregate stability, and weak soil structure. They are generally located on sloping ground, have sparse plant cover, and tend to be in arid or semiarid regions. The index can be used for conservation and watershed planning to assist in identifying soils and areas highly vulnerable to degradation.

Depending on inherent soil characteristics and the climate, soils can vary from highly resistant, or stable, to vulnerable and extremely sensitive to degradation. Under stress, fragile soils can degrade to a new altered state, which may be less favorable or unfavorable for plant growth and less capable of performing soil functions. To assess the fragility of the soil, indicators of vulnerability to degradation

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processes are used. They include organic matter, soil structure, rooting depth, vegetative cover, slope, and aridity.

The organic matter content indicates the capacity of the soil to resist and/or recover from degradation processes. Organic matter improves the soil pore structure, increases water infiltration, and reduces soil compaction and soil erosion. Soil structure indicates the capacity of the soil to resist degradation from accelerated water erosion (by increasing the amount of infiltration). Pore structure is the most important aspect of soil structure as pores provide habitat for organism. Shallow soils are more vulnerable to degradation processes because they have limited rooting depth and have a reduced amount of material from which to form new soil. As erosion removes the upper soil profile, productivity will decline if the subsoil is limiting for crop growth. Vegetative cover is very important as uncovered soil is most vulnerable to the processes of soil erosion, both by wind and water. Slope (a measure of the steepness or the degree of inclination) indicates the degree of vulnerability to erosion and mass movement. Aridity is defined by the shortage of moisture. Lack of water is a main factor limiting biological processes and the ability of the soil to resist and/or recover from degradation.

Soils are placed into interpretive classes based on their index rating, which ranges from 0 to 1. An index rating of 1 is the most fragile, while a rating of zero is the least fragile. Interpretative classes are as follows:

Not Fragile (index rating less than or equal to 0.009) These soils have a very high potential to resist degradation and be highly resilient. They are highly structured with an organic matter content greater than 5.7%, are nearly level, are deep or very deep, have greater than 85% vegetative cover, and are in a climate that is wet or very wet.

Slightly Fragile (index rating less than 0.009 and less than or equal to 0.209) These soils have a high potential to resist degradation and be resilient. They are:

— Poorly structured to weakly structured soils that have an extremely low to moderate content of organic matter, are very deep, have high vegetative cover, occur on nearly level ground, and are in wet or very wet climates;

— Highly structured soils that have a very high content of organic matter, are very shallow to moderately deep, have high vegetative cover, occur on nearly level ground, and are in wet or very wet climates;

— Highly structured soils that have a very high content of organic matter, are very deep, have low to moderately high vegetative cover, occur on nearly level ground, and are in wet or very wet climates;

— Highly structured soils that have a very high content of organic matter, are very deep, have high vegetative cover; are on slopes greater than 3%, and are in wet or very wet climates; or

— Highly structured soils that have a very high content of organic matter, are very deep, have high vegetative cover; occur on nearly level ground, and in semi-dry to mildly wet climates;

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Moderately Fragile (index rating greater than 0.209 and less than or equal to 0.409) These soils have a moderate potential to resist degradation and be moderately resilient. They are:

— Highly structured soils that have a very high content of organic matter, are very shallow, have high vegetative cover, occur in nearly level to moderately sloping areas, and are in semi-dry climates;

— Poorly structured soils that have an extremely low content of organic matter, are deep, have low vegetative cover, occur in nearly level areas, and are in wet or very wet climates;

— Poorly structured soils that have an extremely low content of organic matter, occur on gentle to very steep slopes, have high vegetative cover, and are in wet or very wet climates;

— Weakly structured soils that have a very low content of organic matter, are deep, occur in nearly level to gently sloping areas, have high vegetative cover, and are in semi-dry climates; or

— Weakly structured soils that have a very low content of organic matter, are very shallow to very deep, occur in nearly level to strongly sloping areas, have high vegetative cover, and are in mildly wet climates.

Fragile (index rating greater than 0.409 and less than or equal to 0.609) These soils have a low potential to resist degradation and low resilience. They are:

— Well structured soils that have a low content of organic matter, are shallow to very deep, have moderate to moderately high vegetative cover, occur on steep slopes, and are in dry climates;

— Well structured soils that have a low content of organic matter, are shallow to very deep, have a low vegetative cover, occur in nearly level to gently sloping areas, and are in dry climates;

— Well structured soils that have a low content of organic matter, are deep, have low vegetative cover, occur on nearly level to very steep slopes, and are in a semi-dry climate;

— Moderately structured soils that have a very low content of organic matter, are deep, have moderately high vegetative cover, occur on moderately steep to very steep slopes, and are in semi-dry climates; or

— Weakly structured soils that have a low content of organic matter, occur on moderately steep to very steep slopes, have low vegetative cover, and are in wet or very wet climates.

Very Fragile (index rating greater than 0.609 and less than or equal to 0.809) These soils have a very low potential to resist degradation and very low resilience. They are:

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— Weakly structured soils that have an extremely low content of organic matter, are deep, have low vegetative cover, occur on nearly level to very steep slopes, and are in dry climates;

— Weakly structured soils that have an extremely low content of organic matter, are shallow to very deep, have low vegetative cover, occur on nearly level to very steep slopes, and are in very dry climates; or

— Poorly structured soils that have an extremely low content of organic matter, are very shallow, have no vegetative cover, occur on steep slopes, and are in mildly wet to wet climates.

Extremely Fragile (index rating greater than 0.809 and less than or equal to 1.0)
These soils can have no potential to resist degradation and no resilience. They are:

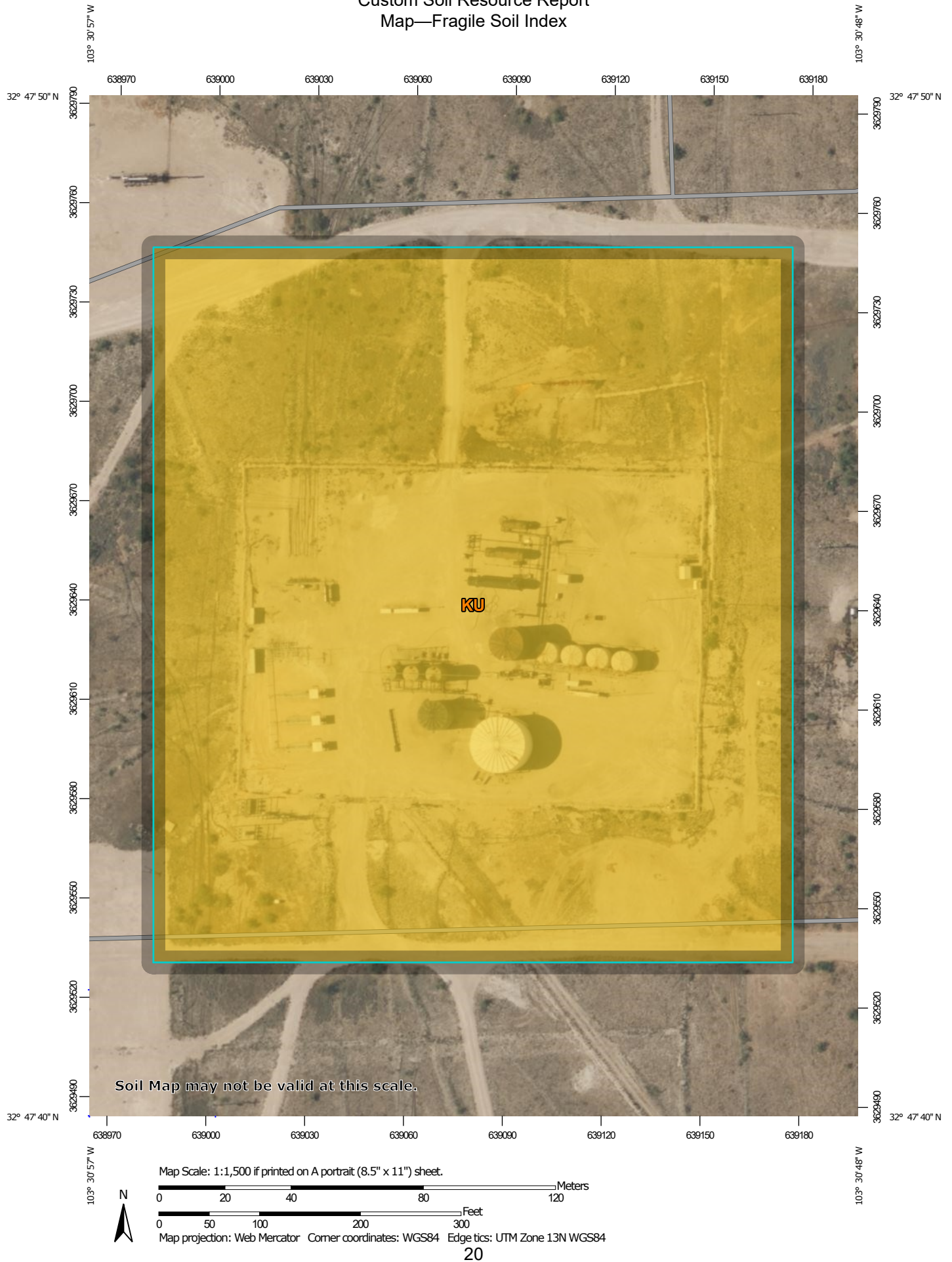
— Poorly structured soils that have an extremely low content of organic matter, are very shallow, have low vegetative cover, occur on very steep slopes, and are in dry or very dry climates;

— Weakly structured soils that have a very low content of organic matter, are nearly level to very deep, have low vegetative cover, occur on very steep slopes, and are in dry climates; or

— Very shallow soils on steep slopes.

The interpretive rating is based on soils that occur in the dominant land use for the map unit component and may not represent soils that occur in site-specific land uses.


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Map—Fragile Soil Index



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MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils






Soil Rating Polygons


-  Extremely fragile
-  Highly fragile
-  Fragile
-  Moderately fragile
-  Slightly fragile
-  Not fragile
-  Not rated or not available

Soil Rating Lines


-  Extremely fragile
-  Highly fragile
-  Fragile
-  Moderately fragile
-  Slightly fragile
-  Not fragile
-  Not rated or not available

Soil Rating Points





-  Extremely fragile
-  Highly fragile
-  Fragile
-  Moderately fragile
-  Slightly fragile
-  Not fragile

 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.

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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)

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Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 20, Sep 6, 2023

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

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Custom Soil Resource Report

Tables—Fragile Soil Index

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	Fragile	Kimbrough (45%)	Poor structure (1.00)	10.4	100.0%
				Dry (0.70)		
				Low organic matter (0.69)		
				Shallow (0.65)		
				High vegetative cover (0.07)		
			Kenhill (12%)	Poor structure (1.00)		
				Very low organic matter (0.91)		
				Dry (0.70)		
				Moderately deep (0.27)		
				Moderately-high vegetative cover (0.14)		
			Douro (12%)	Extremely low organic matter (0.95)		
				Weakly structured (0.75)		
				Dry (0.70)		
				Moderately deep (0.25)		
				Nearly level (0.02)		
			Spraberry (6%)	Extremely low organic matter (0.97)		
				Weakly structured (0.75)		
				Dry (0.70)		
				Moderately deep (0.45)		
				High vegetative cover (0.07)		
Totals for Area of Interest					10.4	100.0%

Custom Soil Resource Report

Rating	Acres in AOI	Percent of AOI
Fragile	10.4	100.0%
Totals for Area of Interest	10.4	100.0%

Rating Options—Fragile Soil Index

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Custom Soil Resource Report

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Chemical Properties

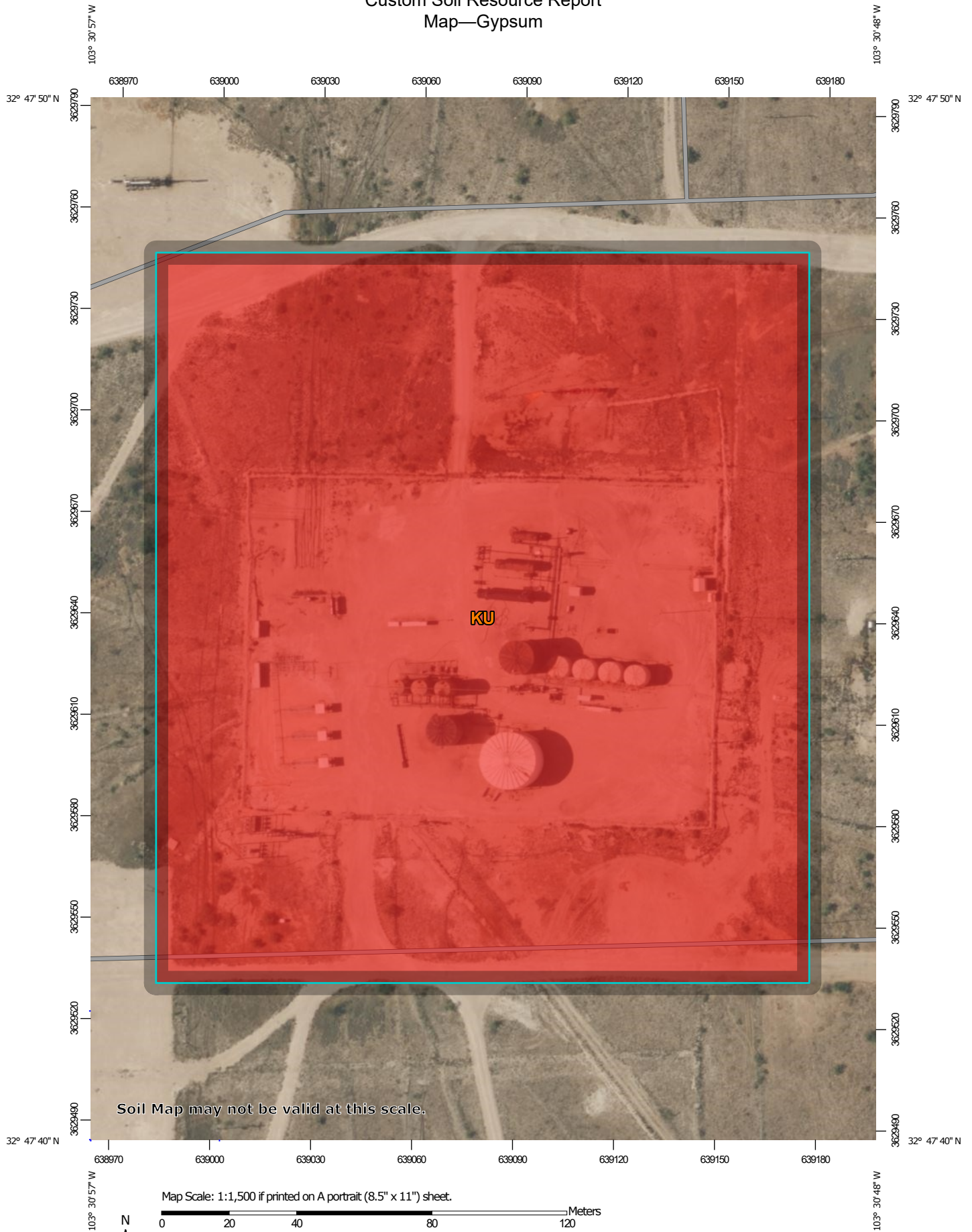
Soil Chemical Properties are measured or inferred from direct observations in the field or laboratory. Examples of soil chemical properties include pH, cation exchange capacity, calcium carbonate, gypsum, and electrical conductivity.

Gypsum


The content of gypsum is the percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils high in content of gypsum, such as those with more than 10 percent gypsum, may collapse if the gypsum is removed by percolating water. Gypsum is corrosive to concrete.

For each soil layer, this attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Custom Soil Resource Report
Map—Gypsum




Custom Soil Resource Report

MAP LEGEND**Area of Interest (AOI)**
 Area of Interest (AOI)
Soils**Soil Rating Polygons**
 = 0

 Not rated or not available
Soil Rating Lines
 = 0



 Not rated or not available
Soil Rating Points
 = 0

 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

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Custom Soil Resource Report

Table—Gypsum

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	0	10.4	100.0%
Totals for Area of Interest			10.4	100.0%

Rating Options—Gypsum

Units of Measure: percent

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: Yes

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

Soil Erosion Factors

Soil Erosion Factors are soil properties and interpretations used in evaluating the soil for potential erosion. Example soil erosion factors can include K factor for the whole soil or on a rock free basis, T factor, wind erodibility group and wind erodibility index.

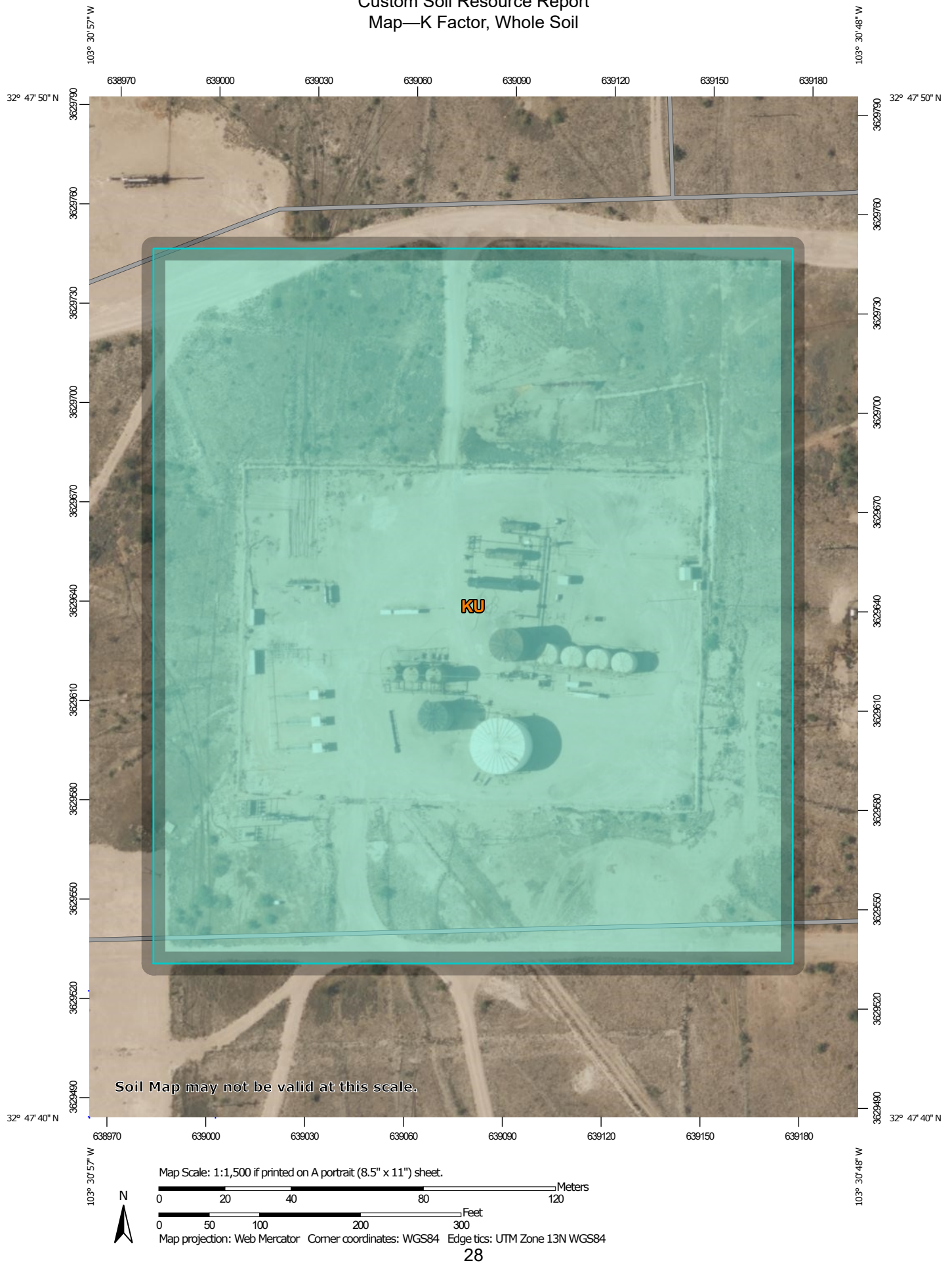
K Factor, Whole Soil

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

"Erosion factor Kw (whole soil)" indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Factor K does not apply to organic horizons and is not reported for those layers.


Custom Soil Resource Report
Map—K Factor, Whole Soil



Custom Soil Resource Report
















MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)










Soils

Soil Rating Polygons
















	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Lines








	.02
	.05
	.10
	.15
	.17
	.20

	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Soil Rating Points

	.02
	.05
	.10
	.15
	.17
	.20
	.24
	.28
	.32
	.37
	.43
	.49
	.55
	.64
	Not rated or not available

Water Features

	Streams and Canals
	Rails
	Interstate Highways
	US Routes
	Major Roads
	Local Roads
	Aerial Photography

MAP INFORMATION

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Custom Soil Resource Report

Table—K Factor, Whole Soil

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	.32	10.4	100.0%
Totals for Area of Interest			10.4	100.0%

Rating Options—K Factor, Whole Soil*Aggregation Method: Dominant Condition*

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

Custom Soil Resource Report

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

For an attribute of a soil horizon, a depth qualification must be specified. In most cases it is probably most appropriate to specify a fixed depth range, either in centimeters or inches. The Bottom Depth must be greater than the Top Depth, and the Top Depth can be greater than zero. The choice of "inches" or "centimeters" only applies to the depth of soil to be evaluated. It has no influence on the units of measure the data are presented in.

When "Surface Layer" is specified as the depth qualifier, only the surface layer or horizon is considered when deriving a value for a component, but keep in mind that the thickness of the surface layer varies from component to component.

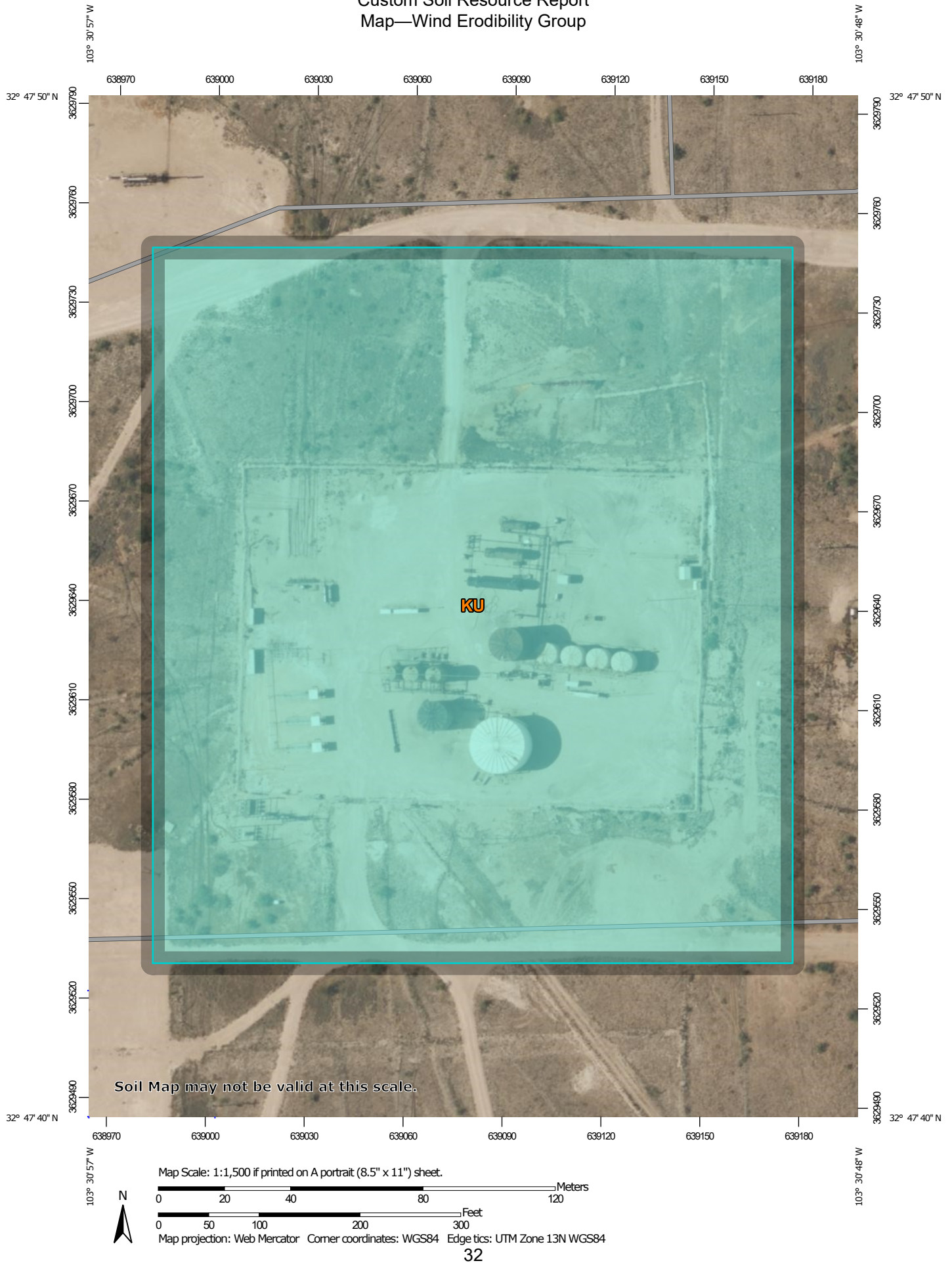
When "All Layers" is specified as the depth qualifier, all layers recorded for a component are considered when deriving the value for that component.

Whenever more than one layer or horizon is considered when deriving a value for a component, and the attribute being aggregated is a numeric attribute, a weighted average value is returned, where the weighting factor is the layer or horizon thickness.

Wind Erodibility Group

A wind erodibility group (WEG) consists of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.


Custom Soil Resource Report
Map—Wind Erodibility Group



Custom Soil Resource Report










MAP LEGEND

Area of Interest (AOI)











 Area of Interest (AOI)

Soils


Soil Rating Polygons

- | | |
|---|----------------------------|
|  | 1 |
|  | 2 |
|  | 3 |
|  | 4 |
|  | 4L |
|  | 5 |
|  | 6 |
|  | 7 |
|  | 8 |
|  | Not rated or not available |

Soil Rating Lines

- | | |
|---|----------------------------|
|  | 1 |
|  | 2 |
|  | 3 |
|  | 4 |
|  | 4L |
|  | 5 |
|  | 6 |
|  | 7 |
|  | 8 |
|  | Not rated or not available |





Soil Rating Points

- | | |
|---|----------------------------|
|  | 1 |
|  | 2 |
|  | 3 |
|  | 4 |
|  | 4L |
|  | 5 |
|  | 6 |
|  | 7 |
|  | 8 |
|  | 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

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Custom Soil Resource Report

Table—Wind Erodibility Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	5	10.4	100.0%
Totals for Area of Interest			10.4	100.0%

Rating Options—Wind Erodibility Group*Aggregation Method: Dominant Condition*

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Condition" first groups like attribute values for the components in a map unit. For each group, percent composition is set to the sum of the percent composition of all components participating in that group. These groups now represent "conditions" rather than components. The attribute value associated with the group with the highest cumulative percent composition is returned. If more than one group shares the highest cumulative percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher group value should be returned in the case of a percent composition tie. The result returned by this aggregation method represents the dominant condition throughout the map unit only when no tie has occurred.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

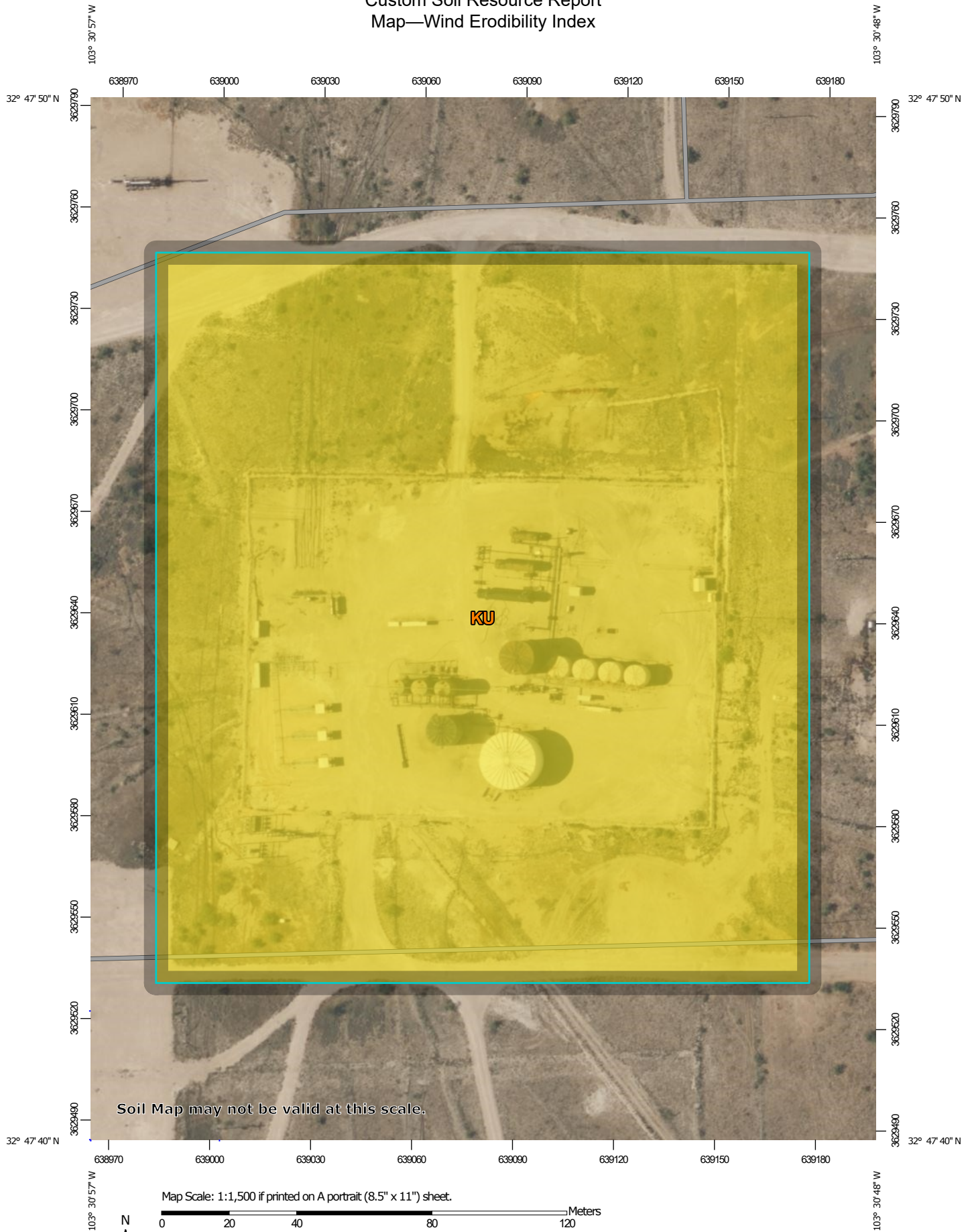
Custom Soil Resource Report

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Wind Erodibility Index

The wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.


Custom Soil Resource Report
Map—Wind Erodibility Index



Custom Soil Resource Report













MAP LEGEND

Area of Interest (AOI)










 Area of Interest (AOI)

Soils

Soil Rating Polygons

	0
	38
	48
	56
	86
	134
	160
	180
	220
	250
	310
	Not rated or not available

Soil Rating Lines













	0
	38
	48
	56
	86
	134
	160
	180
	220

 250

 310

 Not rated or not available



Soil Rating Points

	0
	38
	48
	56
	86
	134
	160
	180
	220
	250
	310
	Not rated or not available

Water Features

 Streams and Canals

Transportation

	Rails
	Interstate Highways
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	Major Roads
	Local Roads

Background

 Aerial Photography

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Custom Soil Resource Report

Table—Wind Erodibility Index

Map unit symbol	Map unit name	Rating (tons per acre per year)	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	56	10.4	100.0%
Totals for Area of Interest			10.4	100.0%

Rating Options—Wind Erodibility Index

Units of Measure: tons per acre per year

Aggregation Method: Dominant Condition

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

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Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

Custom Soil Resource Report

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Depth to Bedrock

The term bedrock in soil survey refers to a continuous root and water restrictive layer of rock that occurs within the soil profile.

There are many types of restrictions that can occur within the soil profile but this theme only includes the three restrictions that use the term bedrock. These are:

- 1) Lithic Bedrock
- 2) Paralithic Bedrock
- 3) Densic Bedrock

Lithic bedrock and paralithic bedrock are comprised of igneous, metamorphic, and sedimentary rocks, which are coherent and consolidated into rock through pressure, heat, cementation, or fusion. Lithic bedrock represents the hardest type of bedrock, with a hardness of strongly coherent to indurated. Paralithic bedrock has a hardness of extremely weakly coherent to moderately coherent. It can occur as a thin layer of weathered bedrock above harder lithic bedrock. Paralithic bedrock can also be much thicker, extending well below the soil profile.

Densic bedrock represents a unique kind of bedrock recognized within the soil survey. It is non-coherent and consolidated, dense root restrictive material, formed by pressure, heat, and dewatering of earth materials or sediments. Densic bedrock differs from densic materials, which formed under the compaction of glaciers, mudflows, and or human-caused compaction.

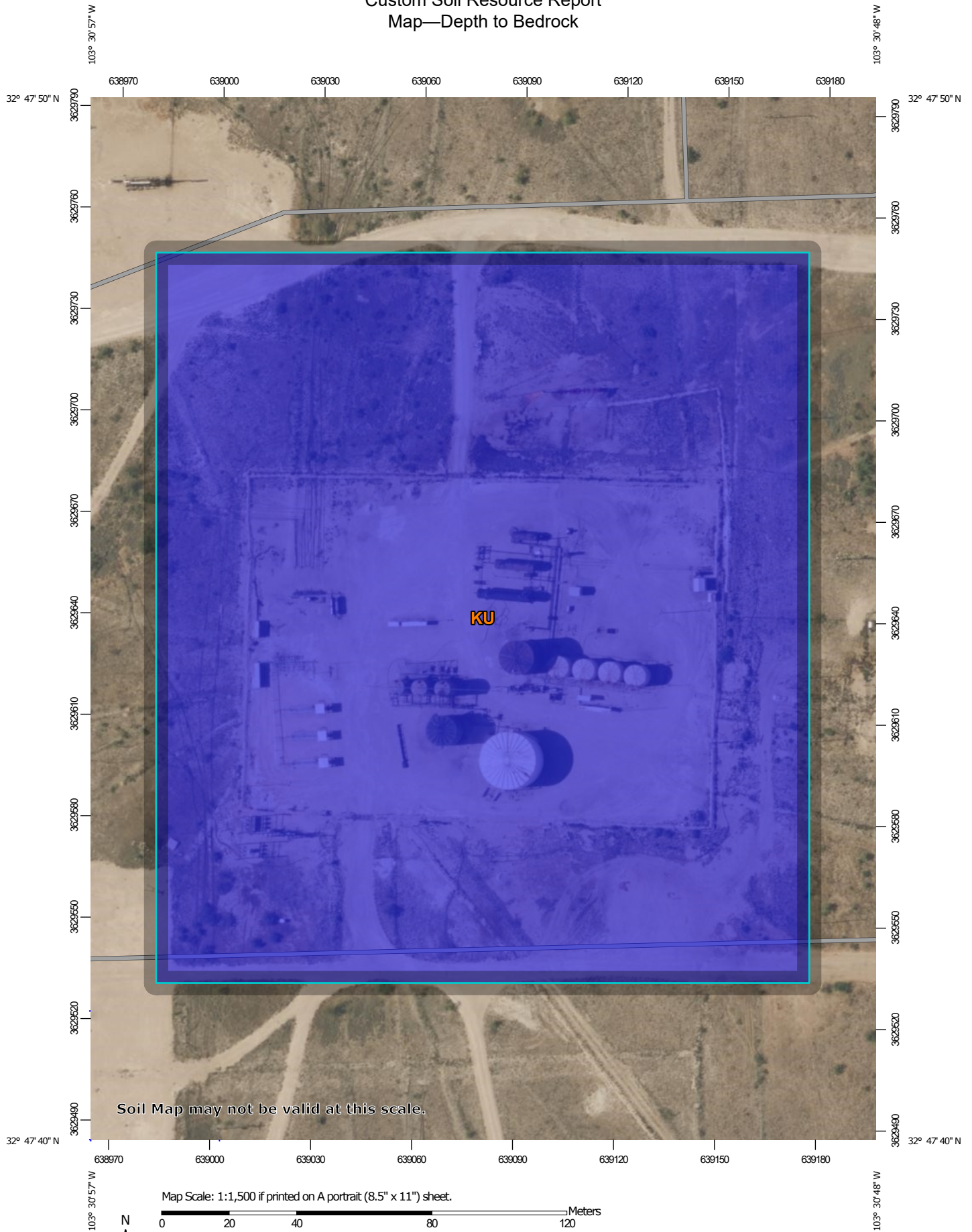
If more than one type of bedrock is described for an individual soil type, the depth to the shallowest one is given. If no bedrock is described in a map unit, it is represented by the "greater than 200" depth class.

Depth to bedrock is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil

Custom Soil Resource Report

component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.


Custom Soil Resource Report
Map—Depth to Bedrock



Custom Soil Resource Report



MAP LEGEND

Area of Interest (AOI)


 Area of Interest (AOI)

Soils







Soil Rating Polygons


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

Soil Rating Lines


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

Soil Rating Points






-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200

 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: Lea County, New Mexico
Survey Area Data: Version 20, Sep 6, 2023

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.

Custom Soil Resource Report

Table—Depth to Bedrock

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	>200	10.4	100.0%
Totals for Area of Interest			10.4	100.0%

Rating Options—Depth to Bedrock

Units of Measure: centimeters

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

Custom Soil Resource Report

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

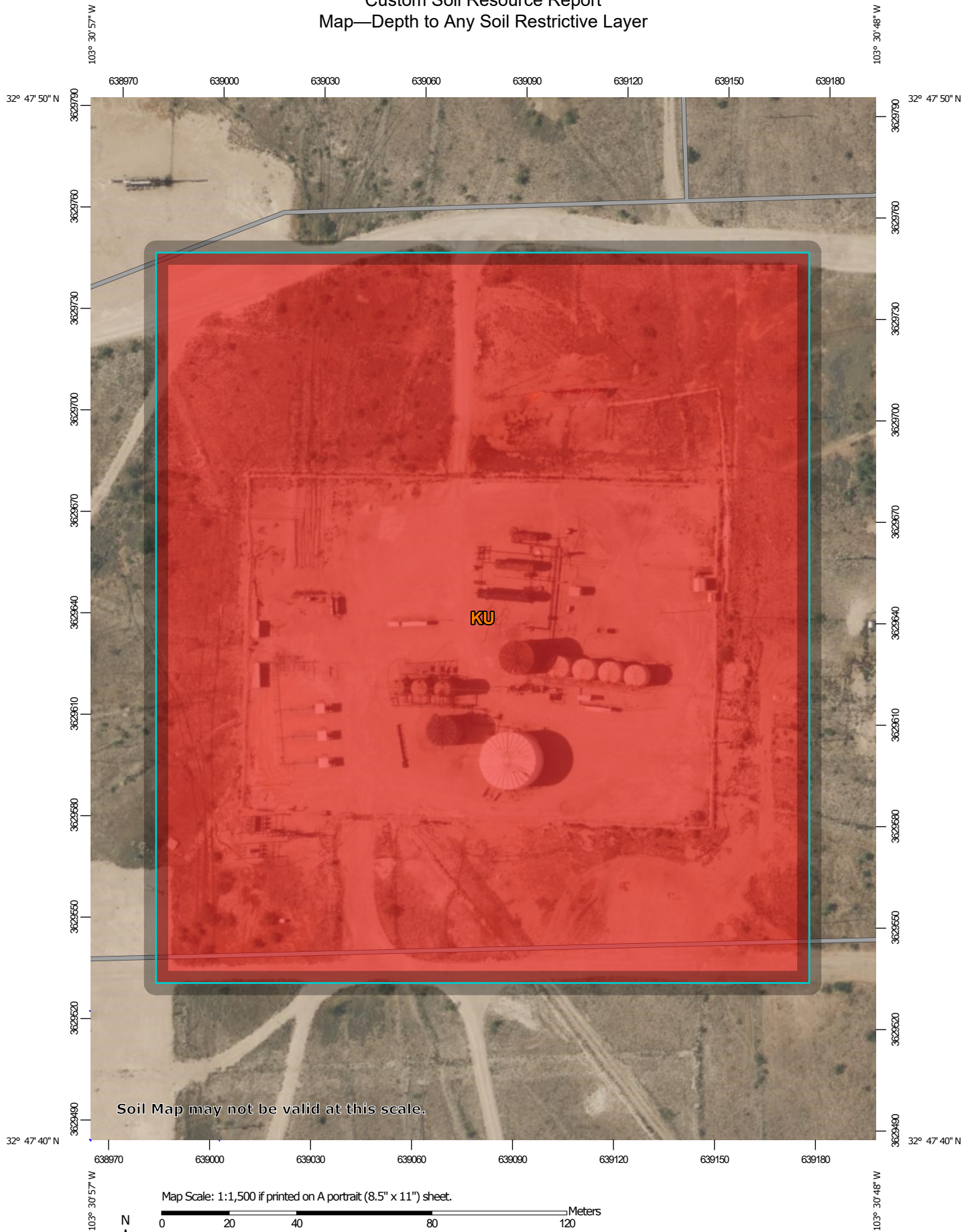
Depth to Any Soil Restrictive Layer

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "greater than 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.


Custom Soil Resource Report
Map—Depth to Any Soil Restrictive Layer



Custom Soil Resource Report








MAP LEGEND

Area of Interest (AOI)



 Area of Interest (AOI)

Soils







Soil Rating Polygons


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

Soil Rating Lines


-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200
-  Not rated or not available

Soil Rating Points






-  0 - 25
-  25 - 50
-  50 - 100
-  100 - 150
-  150 - 200
-  > 200

 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: Lea County, New Mexico
Survey Area Data: Version 20, Sep 6, 2023

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.

Custom Soil Resource Report

Table—Depth to Any Soil Restrictive Layer

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	25	10.4	100.0%
Totals for Area of Interest			10.4	100.0%

Rating Options—Depth to Any Soil Restrictive Layer

Units of Measure: centimeters

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Lower

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

Custom Soil Resource Report

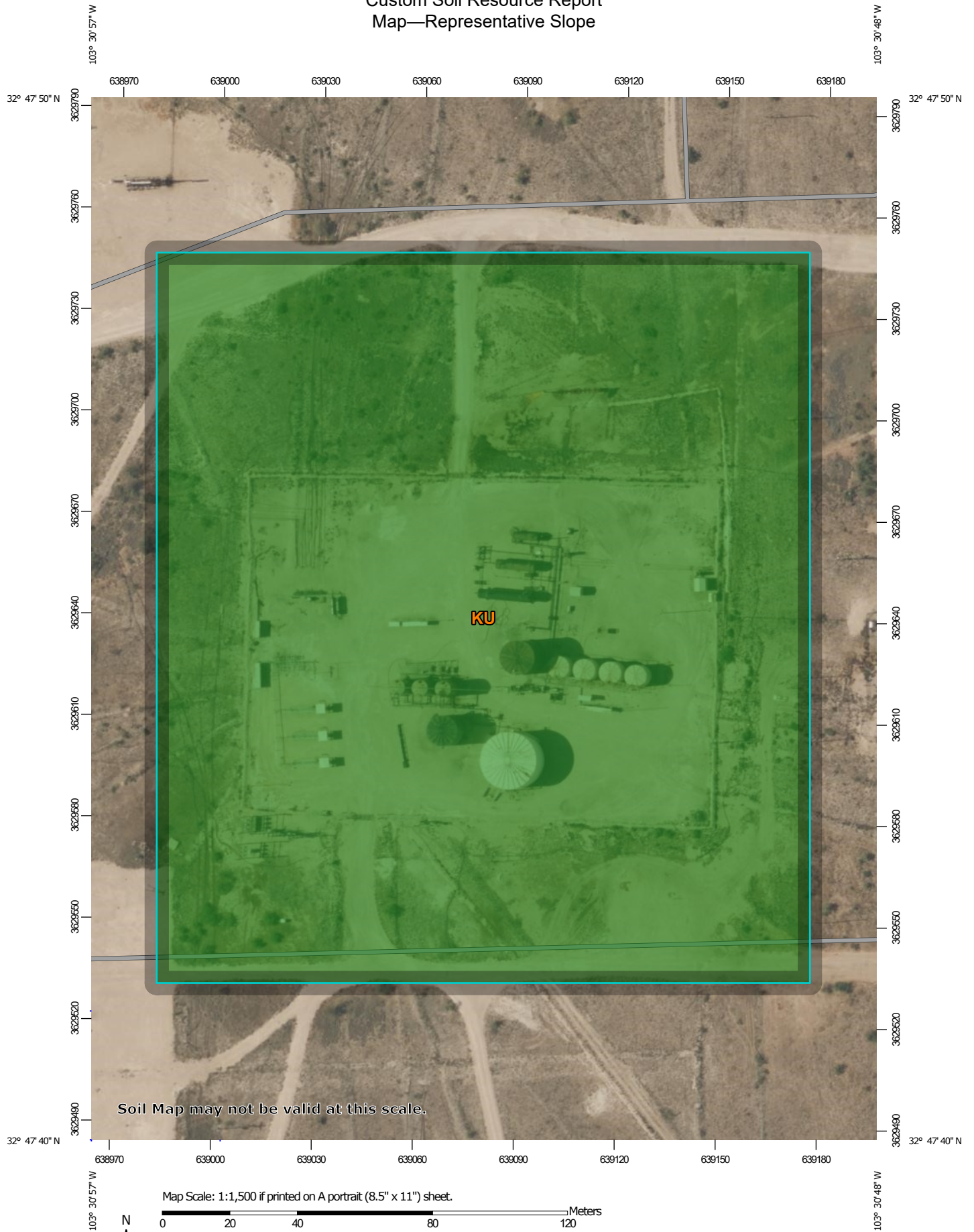
This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Representative Slope

Slope gradient is the difference in elevation between two points, expressed as a percentage of the distance between those points.

The slope gradient is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.


Custom Soil Resource Report
Map—Representative Slope



Custom Soil Resource Report





MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils







Soil Rating Polygons

 0 - 5
 5 - 15
 15 - 45
 45 - 60
 60 - 100
 Not rated or not available


Soil Rating Lines

 0 - 5
 5 - 15
 15 - 45
 45 - 60
 60 - 100
 Not rated or not available






Soil Rating Points

 0 - 5
 5 - 15
 15 - 45
 45 - 60
 60 - 100
 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: Lea County, New Mexico
 Survey Area Data: Version 20, Sep 6, 2023

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.

Custom Soil Resource Report

Table—Representative Slope

Map unit symbol	Map unit name	Rating (percent)	Acres in AOI	Percent of AOI
KU	Kimbrough-Lea complex, dry, 0 to 3 percent slopes	1.0	10.4	100.0%
Totals for Area of Interest			10.4	100.0%

Rating Options—Representative Slope

Units of Measure: percent

Aggregation Method: Dominant Component

Aggregation is the process by which a set of component attribute values is reduced to a single value that represents the map unit as a whole.

A map unit is typically composed of one or more "components". A component is either some type of soil or some nonsoil entity, e.g., rock outcrop. For the attribute being aggregated, the first step of the aggregation process is to derive one attribute value for each of a map unit's components. From this set of component attributes, the next step of the aggregation process derives a single value that represents the map unit as a whole. Once a single value for each map unit is derived, a thematic map for soil map units can be rendered. Aggregation must be done because, on any soil map, map units are delineated but components are not.

For each of a map unit's components, a corresponding percent composition is recorded. A percent composition of 60 indicates that the corresponding component typically makes up approximately 60% of the map unit. Percent composition is a critical factor in some, but not all, aggregation methods.

The aggregation method "Dominant Component" returns the attribute value associated with the component with the highest percent composition in the map unit. If more than one component shares the highest percent composition, the corresponding "tie-break" rule determines which value should be returned. The "tie-break" rule indicates whether the lower or higher attribute value should be returned in the case of a percent composition tie. The result returned by this aggregation method may or may not represent the dominant condition throughout the map unit.

Component Percent Cutoff: None Specified

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule: Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero: No

Custom Soil Resource Report

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

References

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Custom Soil Resource Report

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PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

December 28, 2023

DAN DUNKELBERG

TRINITY OILFIELD SERVICES & RENTALS, LLC

P. O. BOX 2587

HOBBS, NM 88241

RE: VGWU BATTERY (BERM) - 10.17.23

Enclosed are the results of analyses for samples received by the laboratory on 12/20/23 16:30.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-23-16. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is fluid and cursive, with the first name "Celey" and last name "Keene" clearly distinguishable.

Celey D. Keene

Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DV-001.0-00.0-S (H236799-01)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1460	16.0	12/22/2023	ND	416	104	400	7.41		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 94.1 % 48.2-134

Surrogate: 1-Chlorooctadecane 110 % 49.1-148

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DV-001.0-01.0-S (H236799-02)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: HM						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1650	16.0	12/22/2023	ND	416	104	400	7.41		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	18.6	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 87.2 % 48.2-134

Surrogate: 1-Chlorooctadecane 105 % 49.1-148

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.

Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DV-002.0-00.0-S (H236799-03)

BTEx 8021B		mg/kg		Analyzed By: JH					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34	
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71	
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08	
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02	
Total BTEX	<0.300	0.300	12/22/2023	ND					

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	160	16.0	12/22/2023	ND	432	108	400	0.00	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 98.6 % 48.2-134

Surrogate: 1-Chlorooctadecane 117 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DV-003.0-00.0-S (H236799-04)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	432	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	122	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	19.6	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 93.2 % 48.2-134

Surrogate: 1-Chlorooctadecane 113 % 49.1-148

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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-001.0-01.0-S (H236799-05)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEx	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1470	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 93.2 % 48.2-134

Surrogate: 1-Chlorooctadecane 110 % 49.1-148

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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-001.1-01.0-P (H236799-06)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	272	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10*	<10.0	10.0	12/27/2023	ND	214	107	200	3.24		
DRO >C10-C28*	10.9	10.0	12/27/2023	ND	214	107	200	3.15		
EXT DRO >C28-C36	<10.0	10.0	12/27/2023	ND						

Surrogate: 1-Chlorooctane 85.5 % 48.2-134

Surrogate: 1-Chlorooctadecane 73.1 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-002.0-01.0-S (H236799-07)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEx	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	2040	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 100 % 48.2-134

Surrogate: 1-Chlorooctadecane 122 % 49.1-148

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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-003.0-01.0-S (H236799-08)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	672	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 85.9 % 48.2-134

Surrogate: 1-Chlorooctadecane 101 % 49.1-148

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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-003.1-01.0-S (H236799-09)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1740	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	29.5	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 96.0 % 48.2-134

Surrogate: 1-Chlorooctadecane 115 % 49.1-148

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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-004.0-01.0-S (H236799-10)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEx	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1460	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	312	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	56.1	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 98.1 % 48.2-134

Surrogate: 1-Chlorooctadecane 122 % 49.1-148

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Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-004.1-01.0-S (H236799-11)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	288	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 92.4 % 48.2-134

Surrogate: 1-Chlorooctadecane 108 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-002.4-01.0-S (H236799-12)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	352	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 108 % 48.2-134

Surrogate: 1-Chlorooctadecane 128 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-003.3-01.0-S (H236799-13)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 96.9 % 48.2-134

Surrogate: 1-Chlorooctadecane 116 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-006.0-01.0-S (H236799-14)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEx	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	224	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	214	107	200	3.24	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	214	107	200	3.15	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 89.9 % 48.2-134

Surrogate: 1-Chlorooctadecane 106 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-005.0-01.0-S (H236799-15)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	736	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	191	95.4	200	1.49	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	205	102	200	0.626	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 92.4 % 48.2-134

Surrogate: 1-Chlorooctadecane 88.7 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-005.1-01.0-S (H236799-16)

BTEX 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEX	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 103 % 71.5-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	224	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	191	95.4	200	1.49	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	205	102	200	0.626	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 107 % 48.2-134

Surrogate: 1-Chlorooctadecane 104 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

Analytical Results For:

TRINITY OILFIELD SERVICES & RENTALS, LLC
 DAN DUNKELBERG
 P. O. BOX 2587
 HOBBS NM, 88241
 Fax To: NONE

Received:	12/20/2023	Sampling Date:	12/13/2023
Reported:	12/28/2023	Sampling Type:	Soil
Project Name:	VGWU BATTERY (BERM) - 10.17.23	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Tamara Oldaker
Project Location:	LEA CO., NM		

Sample ID: DH-007.0-01.0-S (H236799-17)

BTEx 8021B		mg/kg		Analyzed By: JH						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	12/22/2023	ND	2.31	116	2.00	7.34		
Toluene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	7.71		
Ethylbenzene*	<0.050	0.050	12/22/2023	ND	2.34	117	2.00	8.08		
Total Xylenes*	<0.150	0.150	12/22/2023	ND	6.96	116	6.00	7.02		
Total BTEx	<0.300	0.300	12/22/2023	ND						

Surrogate: 4-Bromofluorobenzene (PID) 104 % 71.5-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AC						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	256	16.0	12/22/2023	ND	432	108	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/22/2023	ND	191	95.4	200	1.49	
DRO >C10-C28*	<10.0	10.0	12/22/2023	ND	205	102	200	0.626	
EXT DRO >C28-C36	<10.0	10.0	12/22/2023	ND					

Surrogate: 1-Chlorooctane 101 % 48.2-134

Surrogate: 1-Chlorooctadecane 95.4 % 49.1-148

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Celey D. Keene, Lab Director/Quality Manager



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Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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A handwritten signature in black ink, appearing to read "Celey D. Keene".

Celey D. Keene, Lab Director/Quality Manager



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: Trinity Oilfield Services										BILL TO					ANALYSIS REQUEST												
Project Manager: Dan Dunkelberg										P.O. #:					<div style="display: flex; justify-content: space-around;"> <div>Chloride</div> <div>TPH</div> <div>BTEX</div> </div>												
Address: 8426 N. Dal Paso										Company: MorningStar Operating																	
City: Hobbs State: NM Zip: 88241										Attn: Kevin Bennett																	
Phone #: 575-397-4961 Fax #:										Address:																	
Project #: Project Owner: Dan										City:																	
Project Name: VGWU Battery (Berm) - 10.17.23										State: Zip:																	
Project Location: Lea Co., NM										Phone #:																	
Sampler Name: KA										Fax #:																	
FOR LAB USE ONLY				(G)RAB OR (C)OMP.		# CONTAINERS		MATRIX		PRESERV.		SAMPLING															
Lab I.D.		Sample I.D.												DATE		TIME											
H236799																											
1		DV-001.0-00.0-S		G 1				X						12/13/2023													
2		DV-001.0-01.0-S		G 1				X						12/13/2023													
3		DV-002.0-00.0-S		G 1				X						12/13/2023													
4		DV-003.0-00.0-S		G 1				X						12/13/2023													
5		DH-001.0-01.0-S		G 1				X						12/13/2023													
6		DH-001.1-01.0-P		G 1				X						12/13/2023													
7		DH-002.0-01.0-S		G 1				X						12/13/2023													
8		DH-003.0-01.0-S		G 1				X						12/13/2023													
9		DH-003.1-01.0-S		G 1				X						12/13/2023													
10		DH-004.0-01.0-S		G 1				X						12/13/2023													

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Relinquished By:		Date: 12-20-23 Time: 1630		Received By:		Verbal Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #:	
Relinquished By:		Date:		Received By:		REMARKS:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Observed Temp. °C Corrected Temp. °C		Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No		CHECKED BY: (Initials) Turnaround Time: Standard <input checked="" type="checkbox"/> Rush <input type="checkbox"/> Thermometer ID #140 Correction factor -0°C	
						Bacteria (only) Sample Condition Cool Intact Observed Temp. °C <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No Corrected Temp. °C	

† Cardinal cannot accept verbal changes. Please email changes to celey.keene@cardinallabsnm.com



CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: Trinity Oilfield Services				BILL TO				ANALYSIS REQUEST																											
Project Manager: Dan Dunkelberg				P.O. #:																															
Address: 8426 N. Dal Paso				Company: MorningStar Operating																															
City: Hobbs		State: NM		Zip: 88241		Attn: Kevin Bennett																													
Phone #: 575-397-4961		Fax #:		Address:																															
Project #:		Project Owner: Dan		City:																															
Project Name: VGWU Battery (Berm) - 10.17.23				State:																Zip:															
Project Location: Lea Co., NM				Phone #:																															
Sampler Name: KA				Fax #:																															
FOR LAB USE ONLY								MATRIX				PRESERV.				SAMPLING																			
Lab I.D.		Sample I.D.		(G)FAS OR (C)OMP.		# CONTAINERS		GROUNDWATER		WASTEWATER		SOIL		OIL		SLUDGE		OTHER:		ACID/BASE:		ICE / COOL		OTHER:		DATE		TIME		Chloride		TPH		BTEX	
11		DH-004.1-01.0-S		G		1						X														12/13/2023				1		1			
12		DH-002.4-01.0-S		G		1						X														12/13/2023				1		1			
13		DH-003.3-01.0-S		G		1						X														12/13/2023				1		1			
14		DH-006.0-01.0-S		G		1						X														12/13/2023				1		1			
		DH-006.1-01.0-S <i>RJS</i>		G		1						X														12/13/2023									
		DH-006.2-01.0-S <i>RJS</i>		G		1						X														12/13/2023									
15		DH-005.0-01.0-S		G		1						X														12/13/2023				1		1			
16		DH-005.1-01.0-S		G		1						X														12/13/2023				1		1			
17		DH-007.0-01.0-S		G		1						X														12/13/2023									

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: <i>[Signature]</i>		Date: 12-20-23 Time: 1630		Received By: <i>[Signature]</i>		Verbal Result: <input type="checkbox"/> Yes <input type="checkbox"/> No Add'l Phone #:	
Relinquished By:		Date:		Received By:		All Results are emailed. Please provide Email address:	
Relinquished By:		Date:		Received By:		REMARKS:	
Delivered By: (Circle One) Sampler - UPS - Bus - Other:		Observed Temp. °C -2.7 Corrected Temp. °C		Sample Condition Cool Intact <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No		CHECKED BY: (Initials) <i>[Signature]</i>	
						Turnaround Time: Standard <input checked="" type="checkbox"/> Rush <input type="checkbox"/>	
						Bacteria (only) Sample Condition Cool Intact Observed Temp. °C <input type="checkbox"/> Yes <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> No Corrected Temp. °C	

† Cardinal cannot accept verbal changes. Please email changes to celey.keene@cardinallabsnm.com

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QUESTIONS

Action 303599

QUESTIONS

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID:	330132
	Action Number:	303599
	Action Type:	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Prerequisites	
Incident ID (n#)	nAPP2329041721
Incident Name	NAPP2329041721 VACUUM GLORIETTA WEST UNIT BATTERY @ 0
Incident Type	Oil Release
Incident Status	Remediation Closure Report Received
Incident Facility	[FTO1424537321] VGWU PRODUCTION AND INJECTION SYSTEM BATTERY

Location of Release Source	
Please answer all the questions in this group.	
Site Name	VACUUM GLORIETTA WEST UNIT BATTERY
Date Release Discovered	10/17/2023
Surface Owner	State

Incident Details	
Please answer all the questions in this group.	
Incident Type	Oil 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	
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.	
Crude Oil Released (bbls) Details	Cause: Equipment Failure Production Tank Crude Oil Released: 215 BBL Recovered: 200 BBL Lost: 15 BBL.
Produced Water Released (bbls) Details	Not answered.
Is the concentration of chloride in the produced water >10,000 mg/l	Not answered.
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)	Not answered.

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QUESTIONS, Page 2

Action 303599

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID:	330132
	Action Number:	303599
	Action Type:	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

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	Yes
Reasons why this would be considered a submission for a notification of a major release	From paragraph A. "Major release" determine using: (1) an unauthorized release of a volume, excluding gases, of 25 barrels or more.
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.	

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	Not answered.

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: Dan Dunkelberg Title: Consultant Email: dan@trinityoilfieldservices.com Date: 01/22/2024
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QUESTIONS, Page 3

Action 303599

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID:	330132
	Action Number:	303599
	Action Type:	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS**Site Characterization**

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.

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 1 and 5 (mi.)
Any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)	Between ½ and 1 (mi.)
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 ½ and 1 (mi.)
Any other fresh water well or spring	Between 1000 (ft.) and ½ (mi.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between 1000 (ft.) and ½ (mi.)
A subsurface mine	Greater than 5 (mi.)
An (non-karst) unstable area	Greater than 5 (mi.)
Categorize the risk of this well / site being in a karst geology	Low
A 100-year floodplain	Greater than 5 (mi.)
Did the release impact areas not on an exploration, development, production, or storage site	No

Remediation Plan

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.

Requesting a remediation plan approval with this submission	Yes
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.	
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)	2040
TPH (GRO+DRO+MRO) (EPA SW-846 Method 8015M)	368.1
GRO+DRO (EPA SW-846 Method 8015M)	312
BTEX (EPA SW-846 Method 8021B or 8260B)	0
Benzene (EPA SW-846 Method 8021B or 8260B)	0
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.	
On what estimated date will the remediation commence	12/13/2023
On what date will (or did) the final sampling or liner inspection occur	12/13/2023
On what date will (or was) the remediation complete(d)	12/13/2023
What is the estimated surface area (in square feet) that will be reclaimed	0
What is the estimated volume (in cubic yards) that will be reclaimed	0
What is the estimated surface area (in square feet) that will be remediated	0
What is the estimated volume (in cubic yards) that will be remediated	0
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.	
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.	

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QUESTIONS, Page 4

Action 303599

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID:	330132
	Action Number:	303599
	Action Type:	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS**Remediation Plan (continued)**

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.

This remediation will (or is expected to) utilize the following processes to remediate / reduce contaminants:

(Select all answers below that apply.)	
(Ex Situ) Excavation and off-site disposal (i.e. dig and haul, hydrovac, etc.)	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)	Yes
Other Non-listed Remedial Process. Please specify	Remediation activities not required as delineation samples are under NMOCD Closure Criteria.

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 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: Dan Dunkelberg Title: Consultant Email: dan@trinityoilfieldservices.com Date: 03/15/2024
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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.

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QUESTIONS, Page 5

Action 303599

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID:
	330132
	Action Number:
	303599
Action Type:	
[C-141] Remediation Closure Request C-141 (C-141-v-Closure)	

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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QUESTIONS, Page 6

Action 303599

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID:	330132
	Action Number:	303599
	Action Type:	[C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	306042
Sampling date pursuant to Subparagraph (a) of Paragraph (1) of Subsection D of 19.15.29.12 NMAC	12/13/2023
What was the (estimated) number of samples that were to be gathered	17
What was the sampling surface area in square feet	5392

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	Yes
Have the lateral and vertical extents of contamination been fully delineated	Yes
Was this release entirely contained within a lined containment area	No
All areas reasonably needed for production or subsequent drilling operations have been stabilized, returned to the sites existing grade, and have a soil cover that prevents ponding of water, minimizing dust and erosion	Yes
What was the total surface area (in square feet) remediated	0
What was the total volume (cubic yards) remediated	0
All areas not reasonably needed for production or subsequent drilling operations have been reclaimed to contain a minimum of four feet of non-waste contain earthen material with concentrations less than 600 mg/kg chlorides, 100 mg/kg TPH, 50 mg/kg BTEX, and 10 mg/kg Benzene	Yes
What was the total surface area (in square feet) reclaimed	0
What was the total volume (in cubic yards) reclaimed	0
Summarize any additional remediation activities not included by answers (above)	Remediation activities not required as delineation samples are under NMOCD Closure Criteria.

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 (in .pdf format) 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.

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.

I hereby agree and sign off to the above statement	Name: Dan Dunkelberg Title: Consultant Email: dan@trinityoilfieldservices.com Date: 03/15/2024
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QUESTIONS, Page 7

Action 303599

QUESTIONS (continued)

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 303599
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

QUESTIONS

Reclamation Report	
Only answer the questions in this group if all reclamation steps have been completed.	
Requesting a reclamation approval with this submission	No

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CONDITIONS

Action 303599

CONDITIONS

Operator: MorningStar Operating LLC 400 W 7th St Fort Worth, TX 76102	OGRID: 330132
	Action Number: 303599
	Action Type: [C-141] Remediation Closure Request C-141 (C-141-v-Closure)

CONDITIONS

Created By	Condition	Condition Date
nvelez	None	4/25/2024