Land Reclamation Report

Bettis State Com #3

Section 20, Township 24 South, Range 33 East

County: Lea

Vertex File Number: 24E-01276

Incident ID: nAPP2409146069

NMSLO Lease Number: LG55470005

Prepared for:

Tap Rock Operating, LLC.

Prepared by:

Vertex Resource Services Inc.

Date:

November 2024

Land Reclamation Report
Bettis State Com #3
Section 20, Township 24 South, Range 33 East
County: Lea

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

Executive Summary

Tap Rock Operating, LLC. retained Vertex Resource Services Inc. to complete an inspection and Land Reclamation Report for Bettis State Com #3 located on State Land in Section 20, Township 24 South and Range 33 East at the Bettis State Com #3, New Mexico (hereafter referred to as "site"). This document provides a description of the site, summary of the previous environmental work and details of the Land Reclamation. Reseeding was completed on August 17, 2024. This document provides a description of the site, summary of the previous environmental work and details of the Land Reclamation. The site is located at 32.195886, -103.594602 on New Mexico State Land. The site is surrounded by native range land that is used for grazing on all sides. The area is largely dominated by grasses, mesquite, and snakeweed. The area surrounding the site contains similar oil and gas pad or facilities that are common in the Permian Basin. The site is located on mostly level land.

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1.0 Introduction

Tap Rock Operating, LLC. (Tap Rock) retained Vertex Resource Services Inc. to complete a Closure Release and Assessment and a Land Reclamation Report for a produced water release that occurred on March 30, 2024 at the site. It is the intent of this reclamation report to provide documentation for the reclaimed release area that met the stipulations set forth in 19.15.29.13 New Mexico Administrative Code (NMAC). Tap Rock submitted an initial C-141 Release Notification to New Mexico Oil Conservation Division (NMOCD) District 1 on April 1, 2024. Incident ID number nAPP2409146069 was assigned to this incident.

This report fulfills the requirements listed under sections of *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book* (U.S. Department of the Interior and U.S. Department of Agriculture, 2007). This document provides a description of the site, summary of the previous environmental reclamation/restoration work, and the details of the Land Reclamation.

2.0 Background

2.1 Site Description

The site is located approximately 25 miles west of Jal, New Mexico, located on New Mexico State land. The surrounding landscape is associated with plains with elevations ranging between 3,000 and 3,900 feet. The site is mostly level and located in Pastureland. An aerial photograph of the site is included in Appendix A.

2.2 Ecological Setting

The site is situated in the Chihuahuan Desert Grasslands Ecoregion (Griffith et al., 2006). This ecoregion is characterized as including the following natural vegetation: the dominant vegetation was determined to be grasslands dominated by grama, bluestem and dropseed species; sand sage and shinnery oak are also evenly distributed in the grassland. Black grama dominate the historical plant community (United States Department of Agriculture, Natural Resources Conservation Service, 2024). Mean annual air temperature is 61 °F. Mean annual precipitation is between 10 to 13 inches and the frost-free period averages 221 days. The site is within the 1w43 National Map Unit and the soil type at the site (Berino Complex) is classified as "Not prime farmland". The predominant soil texture on the site is Loamy fine sands Berino Cacquie, Pyote and Maljamar fine sands. The full Soil Resource Report is included in Appendix D. Land use in the area is predominantly for grazing livestock.

3.0 Land Reclamation

The Land Reclamation for the site (surface reclamation) is detailed below. This section outlines the principles that were used during the surface reclamation phase for the site. A site schematic that outlines the reclamation areas is included in Appendix A. The Daily Site Visit Report detailing seeding is provided in Appendix B and the New Mexico State Land Office (NMSLO) Seed Mixture Application is included in Appendix D.

3.1 Site Evaluation

The land use surrounding the site is defined as natural; therefore, the end land use would be natural land. A natural area is described as: away from human habitation and activities, where the primary concern is the protection of

ecological receptors. The site will be reclaimed so that the capability of the land will match that of the areas immediately surrounding the site, which consists of rangeland. The area around the release is undisturbed pastureland native to sandy loamy areas. Currently, the site consists of a level area. No site contouring was necessary.

3.2 Release Area Reclamation

Remediation of the reportable release was completed July 2024. The Remediation Closure Report was approved by NMOCD on October 8, 2024. Surface reclamation included determination of background topsoil depth as the site conditions are required to meet pre-existing conditions. Reclamation of the location was completed after backfilling operations. A clean, locally sourced topsoil was imported to the site to backfill the excavation. Analytical results of the samples collected are included in Appendix B. Laboratory Data Reports and Chain of Custody Forms are included in Appendix F.

3.3 Erosion Control

There are currently no erosion concerns on-site, and the use of erosion control devices at this location is not anticipated; however, erosion control devices will be installed at the discretion of the on-site environmental inspector.

3.4 Revegetation

3.4.1 Seeding

A NMSLO Loamy seed mix that matches the surrounding area. Reseeding was conducted via hand broadcasting, and hand-raking seeds to be embedded into the soil at double the application rate. This was conducted on August 17, 2024. A Revegetation report will be submitted after regrowth has exceeded 70%. A copy of the seed mixture is included in Appendix D.

3.4.2 Reclamation Standards

Reclamation success will meet requirements outlined in Chapter 6 of The Gold Book (U.S. Department of the Interior and U.S. Department of Agriculture, 2007) which states that “a self-sustaining, vigorous, diverse, native (or otherwise approved) plant community is established on site, with a density sufficient to control erosion and non-native plant invasion and to re-establish wildlife habitat or forage production”.

3.5 Weed Management

The site will be monitored for vegetative growth throughout all phases of the project. Should noxious or troublesome weeds be identified on-site, a weed management program will be implemented. The weed management program will identify weed species of concern and utilize active and effective control methods. These methods include but are not limited to chemical (herbicide) control, mechanical (mowing) control, or biological control as approved by governing regulatory agencies.

4.0 Monitoring Program

Inspections will be conducted every 90 days, during the growing season, to monitor site progression and assess the need for additional best management practices (BMPs) until the site reaches the desired 70% coverage as per 19.15.29.13 NMAC. Inspections will include photographs of the site and BMPs implemented. During the 90-day inspections, if the site conditions are at or nearing background conditions, a final revegetation report will be completed. The report will provide a summary of the vegetation observed at the site, interpretation of monitoring data collected, interpretation of historical monitoring data, and suggested corrective actions if applicable.

5.0 Final Assessment and Closure Request

Vertex recommends no additional action to address the now reclaimed area. Laboratory analyses of backfill samples collected demonstrate values below NMOCD reclamation closure criteria for areas where depth to groundwater is greater than 100 feet below ground surface. There are no anticipated risks to human, ecological, or hydrological receptors at the site. The site has been reclaimed, contoured, and seeded with the appropriate NMSLO seed mix for loamy soils.

Vertex respectfully requests the his reclamation report for the approved remedial area be approved as all closure requirements set forth in 19.15.29.13 NMAC have been met. Tap Rock certifies that all information in this report and the appendices are correct and that they have complied with all applicable closure requirements and conditions specified in Division rules and directives to meet NMOCD and NMSLO requirements.

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

5.0 References

Griffith, G.E., Omernik, J.M., McGraw, M.M., Jacobi, G.Z., Canavan, C.M., Schrader, T.S., Mercer, D., Hill, R., and Moran, B.C. (2006). *Ecoregions of New Mexico.* Available at: https://www.epa.gov/eco-research/ecoregion-download-files-state-region-6#pane-29

United States Department of Agriculture, Natural Resources Conservation Service. (2024). *Web Soil Survey*. Retrieved from https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

U.S. Department of the Interior and U.S. Department of Agriculture. (2007). *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book.* Fourth edition. Available at: https://www.blm.gov/sites/blm.gov/files/Gold%20Book%202007%20Revised.pdf

6.0 Limitations

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

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

APPENDIX A – Reclamation Site Schematic

Reclamation Area (~4,618 sq.ft.)

VERTEX

0 25 50 ft

Map Center:
Lat/Long: 32.195886°N, 103.594602°W

NAD 1983 UTM Zone 13N

Date: Nov 01/24

N

Reclamation Area
Bettis State Com #3

FIGURE:
1

TAP ROCK RESOURCES

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

Note: Georeferenced image from Esri, 2023. Reclamation boundary from GPS by Vertex Professional Services Ltd., 2024.

VERSATILITY. EXPERTISE.

Document Path: S:\04 - Geomatics\1-Projects\ US PROJECTS\Tap Rock\2024\24E-01276\Project\24E-01276_Bettis State Com #3.aprx

APPENDIX B – Backfill Sample Results

Client Name: Tap Rock Operating, LLC.
Site Name: Bettis State Com #3
NMOCD Tracking #: nAPP2409146069
Project #: 24E-01276
Lab Report: E407245

Table 1. Backfill Sample Field Screen and Laboratory Results

Sample Description			Field Screening			Petroleum Hydrocarbons							Inorganic
						Volatile		Extractable					
Sample ID	Depth (ft)	Sample Date	Volatile Organic Compounds (PID)	Extractable Organic Compounds (PetroFlag)	Chloride Concentration	Benzene	BTEX (Total)	Gasoline Range Organics (GRO)	Diesel Range Organics (DRO)	Motor Oil Range Organics (MRO)	(GRO + DRO)	Total Petroleum Hydrocarbons (TPH)	Chloride Concentration
			(ppm)	(ppm)	(ppm)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
			Depth to Groundwater <50										
BG24-01	N/A	July 29, 2024	-	20	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-02	N/A	July 29, 2024	-	31	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-03	N/A	July 29, 2024	-	25	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-04	N/A	July 29, 2024	-	33	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-05	N/A	July 29, 2024	-	21	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-06	N/A	July 29, 2024	-	19	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-07	N/A	July 29, 2024	-	29	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-08	N/A	July 29, 2024	-	40	ND	ND	ND	ND	ND	ND	ND	ND	ND
BG24-09	N/A	July 29, 2024	-	38	ND	ND	ND	ND	ND	ND	ND	ND	ND

"ND" Not Detected at the Reporting Limit
"-" indicates not analyzed/assessed

APPENDIX C – Seeding Field Report with Photographs

Daily Site Visit Report

Client:	Tap Rock	Inspection Date:	8/17/2024
Site Location Name:	Bettis State Com #3	Report Run Date:	8/17/2024 10:11 PM
Client Contact Name:	Bill Ramsey	API #:	
Client Contact Phone #:	720-238-2787		
Unique Project ID		Project Owner:	
Project Reference #		Project Manager:	

Summary of Times

Arrived at Site	8/17/2024 1:50 PM
Departed Site	8/17/2024 2:58 PM

Field Notes

14:10 Arrived on site; assessed site and completed safety paperwork.

14:12 On site to seed the previously excavated area with natural seed.
Located the recently backfilled excavation and began to apply seed.

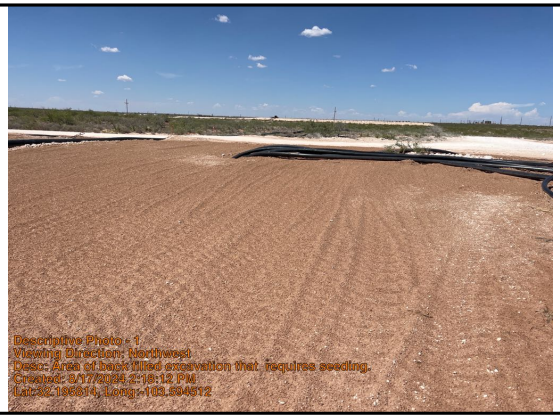
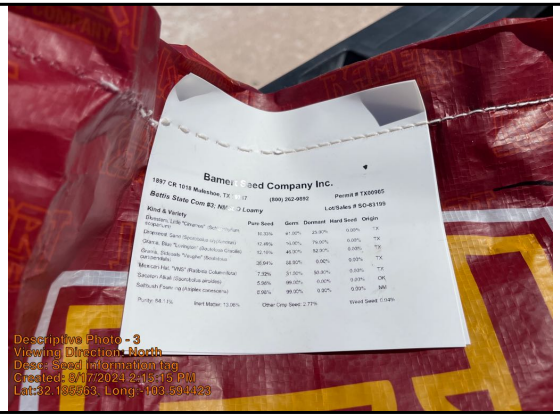
14:13 The area to cover was 0.2 acre. A full bag of seed covers 1 acre, so a fifth of the bag was used to seed the area.

Next Steps & Recommendations

1

Daily Site Visit Report

Site Photos

Viewing Direction: North	**Viewing Direction**: Northwest
	
Area of back filled excavation that requires seeding.	Area of back filled excavation that requires seeding.
Viewing Direction: North	**Viewing Direction**: Northwest
	
Seed information tag	Area post seeding.

Daily Site Visit Report

Daily Site Visit Signature

Inspector: Andrew Ludvik

Signature: 

APPENDIX D – NMSLO Seed Mixture Application

4.4 SEEDING

Drill seeding is the SLO preferred method for applying and incorporating the seed into the soil surface. Other methods of seeding shall only be used when drill seeding is not possible or practical (see Table 3).

Table 3. Recommended seeding methods

Preference	Seeding Method	Situation Best Suited for Seeding Method
1st	Drill Seeding	All applications
2nd	Hydroseeding	Steep slopes – greater than 3 horizontal to 1 vertical*
3rd	Broadcast Seeding - *Mechanical*	Small areas – less than ¼ acres

*Hydroseeding may occur when more economical for smaller sites.

Seed Mixtures

The seed mixtures developed by the SLO are designed to address the soil types and post-reclamation land use, soil stabilization, erosion control issues, seed availability and seed costs. Expensive seed was only specified when absolutely required.

Seeding rates shall be doubled when hydroseeding or broadcast seeding.

The Operator should request the seed supplier to divide the specified seed mixtures into submixtures of: small seed (S), standard sized seed (D), and fluffy and thrashy seed (F).

No substitution of species, variety, or collection for non-varietal species will be allowed unless evidence is submitted in writing by the Operator to the SLO showing that the specified materials are not reasonably available during the seeding period. The substitution of a species, variety, or collection shall be made only with the written approval of the SLO, prior to making a substitution.

"Pure Live Seed" (PLS) is a means of expressing seed quality. Drills need to be calibrated on the basis of PLS/acre. The amount of PLS required for a planting is based on the quality of a given seed lot. Therefore, prior to calibrating a drill, seed lot quality must be known. PLS and bulk seed required are determined by using the seed analysis information on the seed tag in the following formula.

% PLS = [(% germination + % hard or dormant) x % purity)] / 100

Bulk Seed (lbs/ac) = PLS seeding rate recommendation (lbs/ac) / (% PLS / 100)

Recommended seeding rates provide an adequate amount of PLS seed per acre even though seed lots differ in seed size, shape, weight, viability, etc. The variation in individual seed lots causes the amount of bulk seed planted per acre to vary considerably while the actual PLS seeding rates remain constant.

Best Times to Seed

Seeding just prior to the summer monsoon season is recommended. The arrival of the summer monsoon season typically occurs somewhere between the middle of June through the end of August. If seeding immediately prior to the summer monsoons is not practical, the SLO recommends seeding during the monsoons, or after the monsoons and before the first frost. Seeding following the summer monsoons may be successful if rain initiates sufficient growth to allow the plants to go through cool, dry, windy, and hot weather prior to the next summer precipitation events.

Seeding during other times of the year is allowed, however, the risk of failure increases due to spring winds and early germination followed by a dry period. Seeding should not be done when the ground is frozen. Seeding may

proceed when there is evidence of frost, providing the seedbed can be kept in a workable condition so that the seed is planted at the correct depth.

Table 4. Recommended Seeding Times

Preference	Seeding Times
1st	Prior to summer monsoon *June - August*
2nd	During summer monsoon
3rd	After summer monsoon *Before first frost*

Seed Certification

All seed utilized must be purchased through a licensed dealer and meet standards established by the New Mexico Department of Agriculture (NMDA). All seed shall be furnished in sealed, undamaged containers and shall be plainly labeled on tags in accordance with NMDA standards. Following seeding operations, the Operator shall furnish to the SLO the seed tags and one copy of a materials certification signed by the vendor. One or more random samples may be taken by the SLO or his representative prior to, or during drill seeding operations for testing and analysis by an independent seed laboratory.

Drill Seeding

Drill seeding is the most effective seeding method for revegetation of disturbed sites.

Equipment:

Only rangeland drills are recommended. Drills shall be capable of applying the seed in uniform rows spaced at a maximum of 12 inches; 6 to 8 inch spacing between drill rows is most common. Rangeland drills including Truax Flex II drills, Laird rangeland drills, Great Plains rangeland drills, and equivalent are recommended for use.

Light duty drills (drills incapable of withstanding site and soil conditions on sites to be revegetated), standard farm drills, and drills in poor working condition are not acceptable. Use of these drills will result in less than satisfactory revegetation success due to poor seed application and placement. Turf grass type seeders can be utilized, but may have difficulty seeding in rough and rocky terrain and may be subject to considerable damage.

Rangeland drills capable of seeding a variety of seed types are best. Rangeland drills generally have three seed boxes, which can be used for the 3 seed submixtures.

1. Small seed box for small seed.
2. Standard box for average, non fluffy, non trashy seed
3. Fluffy box for fluffy, trashy, or similar seed

All three boxes shall have their own flow metering system. The drill manufacturer will provide operator's instructions for setting flow rates for the drill boxes. Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).

Application Rates:

The seed mixture shall be applied at the drill seed application rate indicated in the seed mixture tables of the Revegetation Plan with adjustments for hydroseeding or broadcast seeding if needed. Variations from the specified seed mixtures must be approved in writing by the SLO.

Application rates identified in the Revegetation Plan seed mixtures are designed to address more factors than the soil type and the standard recommended seeds per acre. The application rates also address practical issues such as

equipment efficiency, operator error, wind, wildlife impact, seed survivability, seed planting depth, and related factors that negatively impact seed placement and survival.

Seeding Depth:

The SLO recommends seed be drilled to a depth of ¼ to ½ inch regardless of the size or type.

Drill Calibration:

Calibrating the drill at the beginning of drill seeding operations is required for each seed mixture. Continual checking and adjusting the drill settings is necessary. Frequency of checking and adjustments depends on the uniformity of the mixed seed, humidity, dust and trash accumulation in the drill metering system, and variability in the roughness of the soil surface.

Drills can be calibrated by a number of different techniques. Utilize drill manufacturers calibration procedures if available; otherwise, the NMSLO recommends the following drill seeding calibration methods described by the NRCS (USDA, 1985. www.mt.nrcs.usda.gov/technical /ecs/plants/technotes/pmtechnotesMT30.html).

Hydraulic Seeding

Hydraulic seeding, or hydroseeding, is the process of broadcast seed using water and a small amount of wood fiber mulch to carry the seed via a hydroseeder. Hydroseeding is typically best suited for steep slope areas where drill seeding is not practical. While the SLO recommends drill seeding as the method of choice for all sites, economics of smaller sites may make hydroseeding more practical. Hydraulic mulching (hydromulching) shall follow hydroseeding on all sites (see section 4.5 Mulching).

Procedures

Following are the three steps for hydroseeding and hydromulching:

1. Preparing the area for seeding;
2. Hydraulic seeding; and,
3. Hydraulic mulching.

1. Preparing the Area for Seeding:

The Operator should first prepare the seedbed (seed section 4.3 Seedbed Preparation).

2. Hydraulic Seeding:

Mix seed, water, and hydraulic mulch fiber into a homogenous slurry and uniformly apply to the areas to be seeded. The slurry must be constantly agitated during application to assure even application and distribution of seed and hydromulch.

Seed should be applied at double the drill seed application rate. At least 1,000 gallons of water should be used per acre for applying the seed and hydraulic mulch. 400 pounds of hydraulic mulch fiber per acre should be included in the mixture to assist the hydroseeder applicator in visually determining the evenness of the seed application and the accuracy of the application rate.

Seed should not be left in the tank with water for more than 2 hours. If this occurs due to equipment failure, or for any other reason, then the mixed material may need to be disposed of either off-site, or applied to the slopes at the Operator's expense. If applied to the slopes, it should not be counted as applied seed and new seed will need to be applied.

3. Hydraulic Mulching (Hydromulching):

Hydromulching is a technique to provide short term soil stabilization and erosion protection while seedlings germinate and begin to establish. Hydromulching differs from hydroseeding in that only hydraulic mulch fiber and tackifier are applied during hydromulching operations. It serves the same purpose as hay mulching and crimping.

Combining seed with all the hydromulch woodfiber and applying everything in a one step operation is highly discouraged and success will be unlikely.

For best results, measure the area(s) to be seeded, divide the disturbed area into small components, depending on the capacity of the hydroseeder, and prepare a chart or plan for determining the number of seed loads and the location(s) for each load. The hydraulic mulch and tackifier should be mixed with water and uniformly applied after seeding, preferably during the same day or within 36 hours. See section 4.5 Mulching for more details on Hydromulching.

Application Rates

Seed mixtures should be applied at double the drill seed application rates in the Revegetation Plans.

Equipment

The hydroseeder shall be equipped with a mechanical power-driven agitator capable of keeping all solids in suspension in a homogeneous slurry until distributed. The pump pressure must maintain a continuous non-fluctuating spray capable of reaching the extremities of the seeding area.

Broadcast Seeding

Broadcast seeding is recommended only for areas inaccessible to a rangeland drill, or too small to warrant the use of a rangeland drill (less than ¼ acres), the SLO recommends drill seeding in all accessible locations. Because the seed is not carefully placed in the soil profile to a controlled depth when broadcast seeding, seed is lost to environmental impacts including wind, rain, wildlife (birds and rodents), sunlight (UV light, heat) and other factors.

Application Rates:

When broadcasting, seed mixtures shall be applied at double the drill seed application rates in the Revegetation Plan.

Procedures:

Areas to be broadcast seeded should receive the same topsoil placement and seedbed preparation as drill seeded areas. If equipment access limitations exist, then some type of soil surface loosening is still necessary such that the topsoil is in a mellow, loosened condition. If slopes are too steep to apply on the contour by drill seeding, broadcast up and down the slope or at a diagonal. Broadcast seeding should not be done during windy conditions.

Do not broadcast an area larger than can be quickly raked, dragged, or chained to cover the seed (within approximately 30 minutes after broadcasting). The seed should be covered approximately ¼ to ½ inches by raking, dragging, chaining, or chain harrowing, unless prevented by equipment access limitations. Care should be taken by the operators and laborers to minimize dragging seed down slope or dragging seed off high spots and concentrating that seed in the low spots. Failure to cover the seed soon after broadcasting, or at all, may result in revegetation failure.

Equipment:

Mechanical broadcast seeding is always recommended over hand broadcast seeding. Mechanical broadcast seeding can be accomplished with any equipment that will evenly spread the seed on the soil surface. A broad range of hand held, ATV mounted, 3-point, and pull type broadcast spreaders are available on the market.

Mechanical broadcasting units must be capable of distributing fluffy and thrashy seed. Most residential type units are not capable. One example of a mechanical broadcasting unit capable of handling fuffy/thrashy seed is distributed by Truax (http://www.truaxcomp.com/seed-slinger.html), other types are available.

NMSLO Seed Mix Shallow (SH)

SHALLOW (SH) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sideoats grama	Vaughn, El Reno	4.0	F
Blue grama	Lovington, Hachita	3.0	D
Little bluestem	Pastura, Cimmaron	1.5	F
Green sprangletop	VNS, Southern	1.0	D
Plains bristlegrass	VNS, Southern	1.0	D
Forbs:			
Firewheel (*Gaillardia*)	VNS, Southern	1.0	D
Shrubs:			
Fourwing saltbush	Marana, Santa Rita	1.0	D
Common winterfat	VNS, Southern	0.5	F
	Total PLS/acre	13.0	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix — Lime – Gypsum (LG)

LIME – GYPSUM (LG) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Black grama	**VNS, Southern**	**1.0**	**D**
Blue grama	**Lovington**	**1.0**	**D**
Sideoats grama	**Vaughn, El Reno**	**4.0**	**F**
Plains bristlegrass	**VNS, Southern**	**2.0**	**D**
Sand dropseed	**VNS, Southern**	**2.0**	**S**
Forbs:			
Firewheel (*Gaillardia*)	**VNS, Southern**	**1.0**	**D**
Annual Sunflower	**VNS, Southern**	**1.0**	**D**
Shrubs:			
Fourwing saltbush	**VNS, Southern**	**1.0**	**F**
	Total PLS/acre	**13.0**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

NMSLO Seed Mix — Loamy (L)

LOAMY (L) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Black grama	VNS, Southern	1.0	D
Blue grama	Lovington	1.0	D
Sideoats grama	Vaughn, El Reno	4.0	F
Sand dropseed	VNS, Southern	2.0	S
Alkali sacaton	VNS, Southern	1.0	
Little bluestem	Cimarron, Pastura	1.5	F
Forbs:			
Firewheel (*Gaillardia*)	VNS, Southern	1.0	D
Shrubs:			
Fourwing saltbush	Marana, Santa Rita	1.0	D
Common winterfat	VNS, Southern	0.5	F
	Total PLS/acre	18.0	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

APPENDIX E – Custom Soil Resource Report

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

April 1, 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

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

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

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

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

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

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

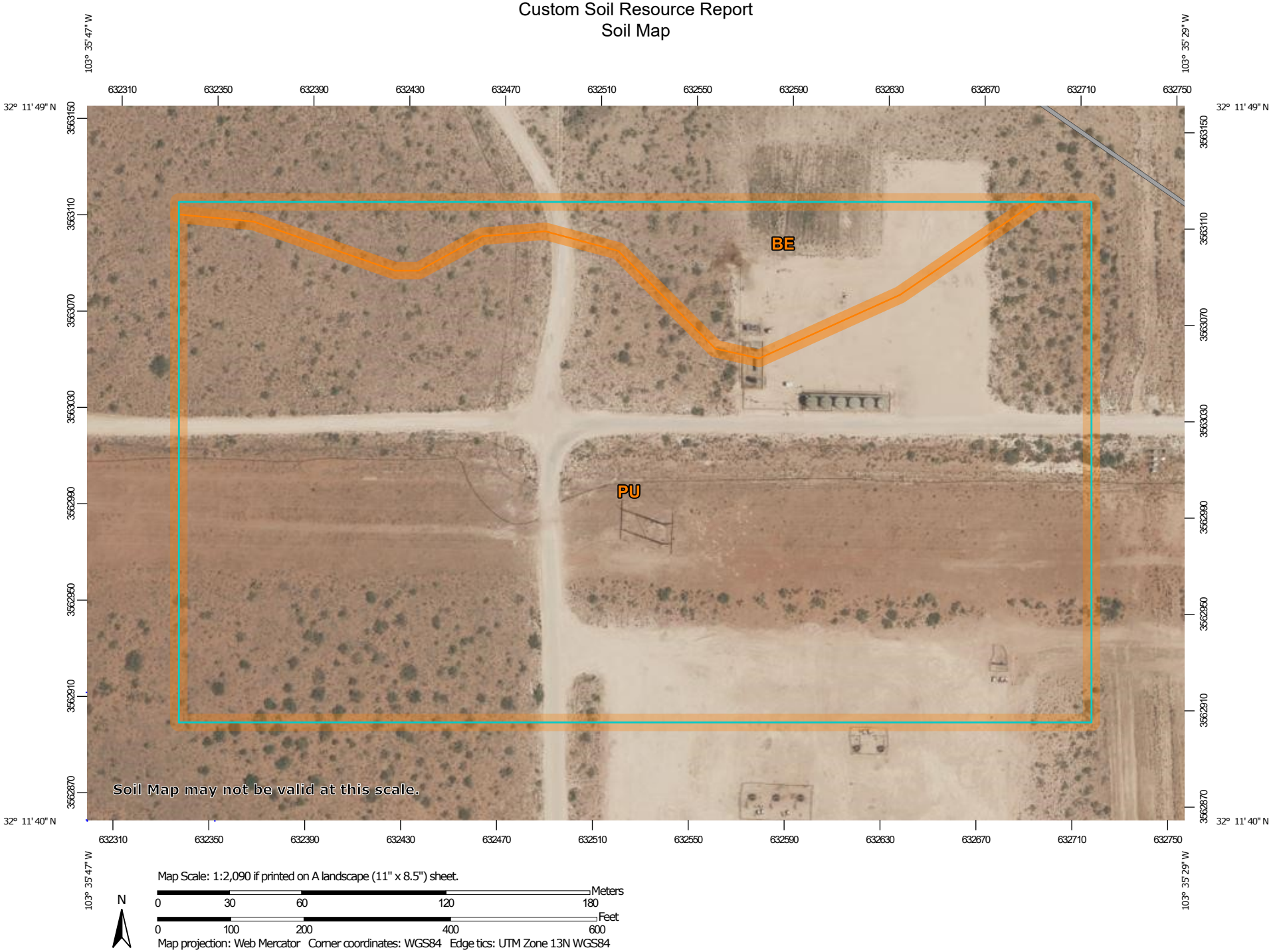
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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

Soil Map

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

Custom Soil Resource Report
Soil Map



MAP LEGEND

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

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

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

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: 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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BE	Berino-Cacique loamy fine sands association	2.5	12.1%
PU	Pyote and Maljamar fine sands	18.0	87.9%
Totals for Area of Interest		**20.4**	**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.

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.

Lea County, New Mexico

BE—Berino-Cacique loamy fine sands association

Map Unit Setting

National map unit symbol: dmpd
Elevation: 3,000 to 3,900 feet
Mean annual precipitation: 10 to 13 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Berino and similar soils: 50 percent
Cacique and similar soils: 40 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berino

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits derived from sedimentary rock over calcareous sandy alluvium derived from sedimentary rock

Typical profile

A - 0 to 6 inches: loamy fine sand
Btk - 6 to 60 inches: sandy clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Description of Cacique

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Calcareous eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 12 inches: loamy fine sand
Bt - 12 to 28 inches: sandy clay loam
Bkm - 28 to 38 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 20 to 40 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: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R070BD004NM - Sandy
Hydric soil rating: No

Minor Components

Maljamar

Percent of map unit: 6 percent
Ecological site: R077CY028TX - Limy Upland 16-21" PZ
Hydric soil rating: No

Palomas

Percent of map unit: 4 percent
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

PU—Pyote and Maljamar fine sands

Map Unit Setting

National map unit symbol: dmqq
Elevation: 3,000 to 3,900 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 60 to 62 degrees F
Frost-free period: 190 to 205 days
Farmland classification: Not prime farmland

Map Unit Composition

Pyote and similar soils: 46 percent
Maljamar and similar soils: 44 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pyote

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 30 inches: fine sand
Bt - 30 to 60 inches: fine sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A

Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Description of Maljamar

Setting

Landform: Plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 24 inches: fine sand
Bt - 24 to 50 inches: sandy clay loam
Bkm - 50 to 60 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 40 to 60 inches to petrocalcic
Drainage class: Well drained
Runoff class: Very low
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: 5 percent
Gypsum, maximum content: 1 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: R070BD003NM - Loamy Sand
Hydric soil rating: No

Minor Components

Kermit

Percent of map unit: 10 percent
Ecological site: R070BC022NM - Sandhills
Hydric soil rating: No

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

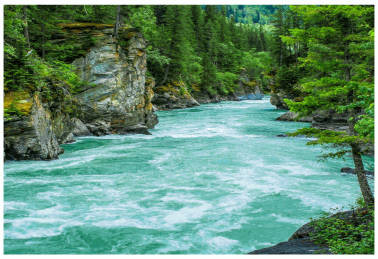
United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX F – Laboratory Data Reports and Chain of Custody Forms

Report to:

Chance Dixon



5796 U.S. Hwy 64
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envirotech

Practical Solutions for a Better Tomorrow

Analytical Report

Vertex Resource Services Inc.

Project Name:	Bettis State Com # 3
Work Order:	E407245
Job Number:	24015-0001
Received:	7/31/2024

Revision: 1

Report Reviewed By:

Walter Hinchman
Laboratory Director
8/1/24

Envirotech Inc. certifies the test results meet all requirements of TNI unless noted otherwise.
Statement of Data Authenticity: Envirotech Inc, attests the data reported has not been altered in any way.
Partial or incomplete reproduction of this report is prohibited, unless approved by Envirotech Inc.
Envirotech Inc, holds the Utah TNI certification NM00979 for data reported.
Envirotech Inc, holds the Texas TNI certification T104704557 for data reported.

Date Reported: 8/1/24

Chance Dixon
3101 Boyd Drive
Carlsbad, NM 88220

Project Name: Bettis State Com # 3
Workorder: E407245
Date Received: 7/31/2024 8:30:00AM

Chance Dixon,

Thank you for choosing Envirotech, Inc. as your analytical testing laboratory for the sample(s) received on, 7/31/2024 8:30:00AM, under the Project Name: Bettis State Com # 3.

The analytical test results summarized in this report with the Project Name: Bettis State Com # 3 apply to the individual samples collected, identified and submitted bearing the project name on the enclosed chain-of-custody. Subcontracted sample analyses not conducted by Envirotech, Inc., are attached in full as issued by the subcontract laboratory.

Please review the Chain-of-Custody (COC) and Sample Receipt Checklist (SRC) for any issues reguarding sample receipt temperature, containers, preservation etc. To best understand your test results, review the entire report summarizing your sample data and the associated quality control batch data.

All reported data in this analytical report were analyzed according to the referenced method(s) and are in compliance with the latest NELAC/TNI standards, unless otherwise noted. Samples or analytical quality control parameters not meeting specific QC criteria are qualified with a data flag. Data flag definitions are located in the Notes and Definitions section of this analytical report.

If you have any questions concerning this report, please feel free to contact Envirotech, Inc.

Respectfully,

Walter Hinchman
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Sample Summary

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	**Reported:**
3101 Boyd Drive	Project Number:	24015-0001	
Carlsbad NM, 88220	Project Manager:	Chance Dixon	08/01/24 11:50

Client Sample ID	Lab Sample ID	Matrix	Sampled	Received	Container
BG 24 - 01 - 0'	E407245-01A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 02 - 0'	E407245-02A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 03 - 0'	E407245-03A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 04 - 0'	E407245-04A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 05 - 0'	E407245-05A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 06 - 0'	E407245-06A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 07 - 0'	E407245-07A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 08 - 0'	E407245-08A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 09 - 0'	E407245-09A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.
BG 24 - 10 - 0'	E407245-10A	Soil	07/29/24	07/31/24	Glass Jar, 2 oz.

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 01 - 0'

E407245-01

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*116 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*90.2 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*108 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*116 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*90.2 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*108 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*94.2 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 02 - 0'

E407245-02

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*117 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.5 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*107 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*117 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.5 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*107 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*81.1 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 03 - 0'

E407245-03

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*114 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*89.6 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*108 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*114 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*89.6 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*108 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*85.0 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 04 - 0'

E407245-04

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*113 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.3 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*113 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.3 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*100 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 05 - 0'

E407245-05

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*116 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*92.9 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*116 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*92.9 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*96.7 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 06 - 0'

E407245-06

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*114 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.2 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*114 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.2 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*90.5 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 07 - 0'

E407245-07

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*118 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.7 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*110 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*118 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*88.7 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*110 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*94.4 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 08 - 0'

E407245-08

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*117 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*89.5 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*117 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*89.5 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*89.2 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 09 - 0'

E407245-09

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*116 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*92.8 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*116 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*92.8 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*109 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*91.7 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

Sample Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

BG 24 - 10 - 0'

E407245-10

Analyte	Result	Reporting Limit	Dilution	Prepared	Analyzed	Notes
Volatile Organic Compounds by EPA 8260B	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Benzene	ND	0.0250	1	07/31/24	07/31/24	
Ethylbenzene	ND	0.0250	1	07/31/24	07/31/24	
Toluene	ND	0.0250	1	07/31/24	07/31/24	
o-Xylene	ND	0.0250	1	07/31/24	07/31/24	
p,m-Xylene	ND	0.0500	1	07/31/24	07/31/24	
Total Xylenes	ND	0.0250	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*115 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*90.8 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*108 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - GRO	mg/kg	mg/kg	Analyst: IY			Batch: 2431078
Gasoline Range Organics (C6-C10)	ND	20.0	1	07/31/24	07/31/24	
Surrogate: Bromofluorobenzene		*115 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: 1,2-Dichloroethane-d4		*90.8 %*	*70-130*	*07/31/24*	*07/31/24*	
Surrogate: Toluene-d8		*108 %*	*70-130*	*07/31/24*	*07/31/24*	
Nonhalogenated Organics by EPA 8015D - DRO/ORO	mg/kg	mg/kg	Analyst: KM			Batch: 2431064
Diesel Range Organics (C10-C28)	ND	25.0	1	07/31/24	07/31/24	
Oil Range Organics (C28-C36)	ND	50.0	1	07/31/24	07/31/24	
Surrogate: n-Nonane		*93.8 %*	*50-200*	*07/31/24*	*07/31/24*	
Anions by EPA 300.0/9056A	mg/kg	mg/kg	Analyst: WF			Batch: 2431073
Chloride	ND	20.0	1	07/31/24	07/31/24	

QC Summary Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	**Reported:**
3101 Boyd Drive	Project Number:	24015-0001	
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

Volatile Organic Compounds by EPA 8260B

Analyst: IY

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2431078-BLK1)									Prepared: 07/31/24 Analyzed: 07/31/24
Benzene	ND	0.0250							
Ethylbenzene	ND	0.0250							
Toluene	ND	0.0250							
o-Xylene	ND	0.0250							
p,m-Xylene	ND	0.0500							
Total Xylenes	ND	0.0250							
Surrogate: Bromofluorobenzene	*0.582*		*0.500*		*116*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.451*		*0.500*		*90.2*	*70-130*			
Surrogate: Toluene-d8	*0.540*		*0.500*		*108*	*70-130*			
LCS (2431078-BS1)									Prepared: 07/31/24 Analyzed: 07/31/24
Benzene	2.23	0.0250	2.50		89.3	70-130			
Ethylbenzene	2.34	0.0250	2.50		93.4	70-130			
Toluene	2.41	0.0250	2.50		96.5	70-130			
o-Xylene	2.56	0.0250	2.50		102	70-130			
p,m-Xylene	5.12	0.0500	5.00		102	70-130			
Total Xylenes	7.68	0.0250	7.50		102	70-130			
Surrogate: Bromofluorobenzene	*0.587*		*0.500*		*117*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.461*		*0.500*		*92.1*	*70-130*			
Surrogate: Toluene-d8	*0.538*		*0.500*		*108*	*70-130*			
Matrix Spike (2431078-MS1)				**Source: E407245-06**					Prepared: 07/31/24 Analyzed: 07/31/24
Benzene	2.18	0.0250	2.50	ND	87.2	48-131			
Ethylbenzene	2.31	0.0250	2.50	ND	92.4	45-135			
Toluene	2.38	0.0250	2.50	ND	95.3	48-130			
o-Xylene	2.53	0.0250	2.50	ND	101	43-135			
p,m-Xylene	4.99	0.0500	5.00	ND	99.7	43-135			
Total Xylenes	7.52	0.0250	7.50	ND	100	43-135			
Surrogate: Bromofluorobenzene	*0.582*		*0.500*		*116*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.464*		*0.500*		*92.7*	*70-130*			
Surrogate: Toluene-d8	*0.537*		*0.500*		*107*	*70-130*			
Matrix Spike Dup (2431078-MSD1)				**Source: E407245-06**					Prepared: 07/31/24 Analyzed: 07/31/24
Benzene	2.38	0.0250	2.50	ND	95.4	48-131	8.91	23	
Ethylbenzene	2.52	0.0250	2.50	ND	101	45-135	8.72	27	
Toluene	2.59	0.0250	2.50	ND	104	48-130	8.48	24	
o-Xylene	2.77	0.0250	2.50	ND	111	43-135	9.10	27	
p,m-Xylene	5.47	0.0500	5.00	ND	109	43-135	9.16	27	
Total Xylenes	8.24	0.0250	7.50	ND	110	43-135	9.14	27	
Surrogate: Bromofluorobenzene	*0.586*		*0.500*		*117*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.472*		*0.500*		*94.4*	*70-130*			
Surrogate: Toluene-d8	*0.538*		*0.500*		*108*	*70-130*			

QC Summary Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	**Reported:**
3101 Boyd Drive	Project Number:	24015-0001	
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

Nonhalogenated Organics by EPA 8015D - GRO

Analyst: IY

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2431078-BLK1)									Prepared: 07/31/24 Analyzed: 07/31/24
Gasoline Range Organics (C6-C10)	ND	20.0							
Surrogate: Bromofluorobenzene	*0.582*		*0.500*		*116*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.451*		*0.500*		*90.2*	*70-130*			
Surrogate: Toluene-d8	*0.540*		*0.500*		*108*	*70-130*			
LCS (2431078-BS2)									Prepared: 07/31/24 Analyzed: 07/31/24
Gasoline Range Organics (C6-C10)	49.9	20.0	50.0		99.7	70-130			
Surrogate: Bromofluorobenzene	*0.579*		*0.500*		*116*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.442*		*0.500*		*88.4*	*70-130*			
Surrogate: Toluene-d8	*0.546*		*0.500*		*109*	*70-130*			
Matrix Spike (2431078-MS2)				**Source: E407245-06**					Prepared: 07/31/24 Analyzed: 07/31/24
Gasoline Range Organics (C6-C10)	51.7	20.0	50.0	ND	103	70-130			
Surrogate: Bromofluorobenzene	*0.587*		*0.500*		*117*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.456*		*0.500*		*91.2*	*70-130*			
Surrogate: Toluene-d8	*0.546*		*0.500*		*109*	*70-130*			
Matrix Spike Dup (2431078-MSD2)				**Source: E407245-06**					Prepared: 07/31/24 Analyzed: 07/31/24
Gasoline Range Organics (C6-C10)	51.5	20.0	50.0	ND	103	70-130	0.395	20	
Surrogate: Bromofluorobenzene	*0.595*		*0.500*		*119*	*70-130*			
Surrogate: 1,2-Dichloroethane-d4	*0.439*		*0.500*		*87.8*	*70-130*			
Surrogate: Toluene-d8	*0.560*		*0.500*		*112*	*70-130*			

QC Summary Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	**Reported:**
3101 Boyd Drive	Project Number:	24015-0001	
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

Nonhalogenated Organics by EPA 8015D - DRO/ORO

Analyst: KM

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2431064-BLK1)									Prepared: 07/31/24 Analyzed: 07/31/24
Diesel Range Organics (C10-C28)	ND	25.0							
Oil Range Organics (C28-C36)	ND	50.0							
Surrogate: n-Nonane	*47.1*		*50.0*		*94.3*	*50-200*			
LCS (2431064-BS1)									Prepared: 07/31/24 Analyzed: 07/31/24
Diesel Range Organics (C10-C28)	255	25.0	250		102	38-132			
Surrogate: n-Nonane	*48.8*		*50.0*		*97.7*	*50-200*			
Matrix Spike (2431064-MS1)				**Source: E407245-07**					Prepared: 07/31/24 Analyzed: 07/31/24
Diesel Range Organics (C10-C28)	259	25.0	250	ND	104	38-132			
Surrogate: n-Nonane	*49.2*		*50.0*		*98.4*	*50-200*			
Matrix Spike Dup (2431064-MSD1)				**Source: E407245-07**					Prepared: 07/31/24 Analyzed: 07/31/24
Diesel Range Organics (C10-C28)	269	25.0	250	ND	108	38-132	3.88	20	
Surrogate: n-Nonane	*48.5*		*50.0*		*96.9*	*50-200*			

QC Summary Data

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	**Reported:**
3101 Boyd Drive	Project Number:	24015-0001	
Carlsbad NM, 88220	Project Manager:	Chance Dixon	8/1/2024 11:50:51AM

Anions by EPA 300.0/9056A

Analyst: WF

Analyte	Result	Reporting Limit	Spike Level	Source Result	Rec	Rec Limits	RPD	RPD Limit	Notes
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	%	%	
Blank (2431073-BLK1)									Prepared: 07/31/24 Analyzed: 07/31/24
Chloride	ND	20.0							
LCS (2431073-BS1)									Prepared: 07/31/24 Analyzed: 07/31/24
Chloride	248	20.0	250		99.3	90-110			
Matrix Spike (2431073-MS1)				**Source: E407245-04**					Prepared: 07/31/24 Analyzed: 07/31/24
Chloride	251	20.0	250	ND	100	80-120			
Matrix Spike Dup (2431073-MSD1)				**Source: E407245-04**					Prepared: 07/31/24 Analyzed: 07/31/24
Chloride	256	20.0	250	ND	102	80-120	2.10	20	

QC Summary Report Comment:
Calculations are based off of the raw (non-rounded) data. However, for reporting purposes all QC data is rounded to three significant figures. Therefore, hand calculated values may differ slightly.

Definitions and Notes

Vertex Resource Services Inc.	Project Name:	Bettis State Com # 3	
3101 Boyd Drive	Project Number:	24015-0001	**Reported:**
Carlsbad NM, 88220	Project Manager:	Chance Dixon	08/01/24 11:50

ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
RPD	Relative Percent Difference
DNI	Did Not Ignite
DNR	Did not react with the addition of acid or base.

Note (1): Methods marked with ** are non-accredited methods.

Note (2): Soil data is reported on an "as received" weight basis, unless reported otherwise.

Chain of Custody

Client Information	Invoice Information	Lab Use Only	TAT	State
Client: Vertex (bill direct to TapRock)	Company: TapRock (Bill Ramsey)	Lab WO# E407245	Job Number 24015-0001	1D 2D 3D Std: 2D ✓	NM ✓ CO UT TX
Project Name: Bettis State Com #3	Address:			
Project Manager: Chance Dixon	City, State, Zip:			
Address: Project #: 24E-01276	Phone:			
City, State, Zip:	Email:			
Phone:	Miscellaneous: Direct bill to TapRock ATTN: Bill Ramsey			
Email: cDixon@vertexresource.com				

Sample Information

Time Sampled	Date Sampled	Matrix	No. of Containers	Sample ID	Field Filter	Lab Number	DRO/ORO by 8015	GRO/DRO by 8015	BTEX by 8021	VOC by 8260	Chloride 300.0	BGDOC - NM	TCEQ 1005 - TX	RCRA 8 Metals				Remarks
10:00	7/29/24	Soil	1	BG 24-01 0'		1	✓	✓	✓		✓							
10:05				BG 24-02 0'		2												
10:08				BG 24-03 0'		3												
10:10				BG 24-04 0'		4												
10:13				BG 24-05 0'		5												
10:15				BG 24-06 0'		6												
10:18				BG 24-07 0'		7												
10:20				BG 24-08 0'		8												
10:22				BG 24-09 0'		9												
10:25	↓	↓	↓	BG 24-10 0'		10	↓	↓	↓		↓							

Analysis and Method

EPA Program

SDWA	CWA	RCRA

Compliance Y or N

PWSID #

Additional Instructions:

I, (field sampler), attest to the validity and authenticity of this sample. I am aware that tampering with or intentionally mislabeling the sample location, date or time of collection is considered fraud and may be grounds for legal action.

Sampled by: Stephanie McCarty

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Stephanie McCarty	7/29/24	11:00	Michelle Gonzales	7-30-24	1100
Michelle Gonzales	7-30-24	1630		7-30-24	1633
	7-30-24	2300		7-31-24	0830

Samples requiring thermal preservation must be received on ice the day they are sampled or received packed in ice at an avg temp above 0 but less than 6C on subsequent days.

Lab Use Only

Received on ice: (Y) N

T1 T2 T3

AVG Temp °C 4

Sample Matrix: S - Soil, Sd - Solid, Sg - Sludge, A - Aqueous, O - Other

Container Type: g - glass, p - poly/plastic, ag - amber glass, v - VOA

Note: Samples are discarded 14 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at the client expense. The report for the analysis of the above samples is applicable only to those samples received by the laboratory with this COC. The liability of the laboratory is limited to the amount paid for on the report.

envirotech

Envirotech Analytical Laboratory

Printed: 7/31/2024 9:39:08AM

Sample Receipt Checklist (SRC)

Instructions: Please take note of any NO checkmarks.
If we receive no response concerning these items within 24 hours of the date of this notice, all the samples will be analyzed as requested.

Client:	Vertex Resource Services Inc.	Date Received:	07/31/24 08:30	Work Order ID:	E407245
Phone:	(575) 748-0176	Date Logged In:	07/30/24 16:17	Logged In By:	Noe Soto
Email:	cdixon@vertex.ca	Due Date:	08/01/24 17:00 (1 day TAT)		

Chain of Custody (COC)

1. Does the sample ID match the COC?	Yes	
2. Does the number of samples per sampling site location match the COC	Yes	
3. Were samples dropped off by client or carrier?	Yes	Carrier: Courrier
4. Was the COC complete, i.e., signatures, dates/times, requested analyses?	Yes	
5. Were all samples received within holding time? Note: Analysis, such as pH which should be conducted in the field, i.e, 15 minute hold time, are not included in this disucssion.	Yes	

Comments/Resolution

Sample Turn Around Time (TAT)

6. Did the COC indicate standard TAT, or Expedited TAT?	Yes	

Sample Cooler

7. Was a sample cooler received?	Yes	
8. If yes, was cooler received in good condition?	Yes	
9. Was the sample(s) received intact, i.e., not broken?	Yes	
10. Were custody/security seals present?	No	
11. If yes, were custody/security seals intact?	NA	
12. Was the sample received on ice? If yes, the recorded temp is 4°C, i.e., 6°±2°C Note: Thermal preservation is not required, if samples are received w/i 15 minutes of sampling	Yes	
13. If no visible ice, record the temperature. Actual sample temperature: 4°C		

Sample Container

14. Are aqueous VOC samples present?	No	
15. Are VOC samples collected in VOA Vials?	NA	
16. Is the head space less than 6-8 mm (pea sized or less)?	NA	
17. Was a trip blank (TB) included for VOC analyses?	NA	
18. Are non-VOC samples collected in the correct containers?	Yes	
19. Is the appropriate volume/weight or number of sample containers collected?	Yes	

Field Label

20. Were field sample labels filled out with the minimum information:		
Sample ID?	Yes	
Date/Time Collected?	Yes	
Collectors name?	Yes	

Sample Preservation

21. Does the COC or field labels indicate the samples were preserved?	No	
22. Are sample(s) correctly preserved?	NA	
24. Is lab filteration required and/or requested for dissolved metals?	No	

Multiphase Sample Matrix

26. Does the sample have more than one phase, i.e., multiphase?	No	
27. If yes, does the COC specify which phase(s) is to be analyzed?	NA	

Subcontract Laboratory

28. Are samples required to get sent to a subcontract laboratory?	No	
29. Was a subcontract laboratory specified by the client and if so who?	NA	Subcontract Lab: NA

Client Instruction

Signature of client authorizing changes to the COC or sample disposition.

Date

envirotech Inc.

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

General Information
Phone: (505) 629-6116

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

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

QUESTIONS

Action 404515

QUESTIONS

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Prerequisites	
Incident ID (n#)	**nAPP2409146069**
Incident Name	**NAPP2409146069 BETTIS STATE COM #3 @ 0**
Incident Type	**Produced Water Release**
Incident Status	**Reclamation Report Received**

Location of Release Source	
Please answer all the questions in this group.	
Site Name	BETTIS STATE COM #3
Date Release Discovered	03/30/2024
Surface Owner	State

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

Nature and Volume of Release	
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	*Not answered.*
Produced Water Released (bbls) Details	Cause: Equipment Failure | Flow Line - Production | Produced Water | Released: 17 BBL | Recovered: 0 BBL | Lost: 17 BBL.
Is the concentration of chloride in the produced water >10,000 mg/l	Yes
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)	Release resulted from a blown gasket within the check valve on the transfer line in pasture just off of the lease road.

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

QUESTIONS (continued)

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Nature and Volume of Release (continued)	
Is this a gas only submission (i.e. only significant Mcf values reported)	**No, according to supplied volumes this does not appear to be a "gas only" report.**
Was this a major release as defined by Subsection A of 19.15.29.7 NMAC	**No**
Reasons why this would be considered a submission for a notification of a major release	*Unavailable.*
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: Chance Dixon Title: Project Manager Email: cdixon@vertex.ca Date: 04/01/2024

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

General Information
Phone: (505) 629-6116

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

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

QUESTIONS (continued)

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

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)	Greater than 5 (mi.)
An occupied permanent residence, school, hospital, institution, or church	Between 1 and 5 (mi.)
A spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes	Between 500 and 1000 (ft.)
Any other fresh water well or spring	Between 500 and 1000 (ft.)
Incorporated municipal boundaries or a defined municipal fresh water well field	Greater than 5 (mi.)
A wetland	Between 1 and 5 (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	Yes

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)	17800
TPH (GRO+DRO+MRO) (EPA SW-846 Method 8015M)	0
GRO+DRO (EPA SW-846 Method 8015M)	0
BTEX (EPA SW-846 Method 8021B or 8260B)	0
Benzene (EPA SW-846 Method 8021B or 8260B)	0
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	06/19/2024
On what date will (or did) the final sampling or liner inspection occur	07/12/2024
On what date will (or was) the remediation complete(d)	07/12/2024
What is the estimated surface area (in square feet) that will be reclaimed	2814
What is the estimated volume (in cubic yards) that will be reclaimed	1380
What is the estimated surface area (in square feet) that will be remediated	2814
What is the estimated volume (in cubic yards) that will be remediated	1380
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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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

QUESTIONS (continued)

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

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.)	Yes
Which OCD approved facility will be used for **off-site** disposal	OWL LANDFILL JAL [fJEG1635837366]
OR which OCD approved well (API) will be used for **off-site** disposal	*Not answered.*
OR is the **off-site** disposal site, to be used, out-of-state	No
OR is the **off-site** disposal site, to be used, an NMED facility	No
(Ex Situ) Excavation and **on-site** remediation (i.e. On-Site Land Farms)	No
(In Situ) Soil Vapor Extraction	No
(In Situ) Chemical processing (i.e. Soil Shredding, Potassium Permanganate, etc.)	No
(In Situ) Biological processing (i.e. Microbes / Fertilizer, etc.)	No
(In Situ) Physical processing (i.e. Soil Washing, Gypsum, Disking, etc.)	No
Ground Water Abatement pursuant to 19.15.30 NMAC	No
OTHER (Non-listed remedial process)	No
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: Chance Dixon Title: Project Manager Email: cdixon@vertex.ca Date: 08/22/2024
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 (continued)

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

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 (continued)

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Sampling Event Information	
Last sampling notification (C-141N) recorded	**362340**
Sampling date pursuant to Subparagraph (a) of Paragraph (1) of Subsection D of 19.15.29.12 NMAC	**07/15/2024**
What was the (estimated) number of samples that were to be gathered	**1**
What was the sampling surface area in square feet	**200**

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	2814
What was the total volume (cubic yards) remediated	1380
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	2814
What was the total volume (in cubic yards) reclaimed	1380
Summarize any additional remediation activities not included by answers (above)	The site was remediated to reclamation standards for areas where depth to groundwater is greater than 100 feet bgs.

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: Chance Dixon Title: Project Manager Email: cdixon@vertex.ca Date: 08/22/2024

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QUESTIONS (continued)

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Reclamation Report	
Only answer the questions in this group if all reclamation steps have been completed.	
Requesting a reclamation approval with this submission	Yes
What was the total reclamation surface area (in square feet) for this site	4618
What was the total volume of replacement material (in cubic yards) for this site	1380
Per Paragraph (1) of Subsection D of 19.15.29.13 NMAC the reclamation must contain a minimum of four feet of non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg as analyzed by EPA Method 300.0, or other test methods approved by the division. The soil cover must include a top layer, which is either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.	
Is the soil top layer complete and is it suitable material to establish vegetation	Yes
On what (estimated) date will (or was) the reseeding commence(d)	08/17/2024
Summarize any additional reclamation activities not included by answers (above)	Remediation closure was approved. Reclamation activities including backfill, contouring, backfill sampling, and seeding took place immediately after.
The responsible party must attach information demonstrating they have complied with all applicable reclamation requirements and any conditions or directives of the OCD. This demonstration should be in the form of attachments (in .pdf format) including a scaled site map, any proposed reseeding plans or relevant field notes, photographs of reclaimed area, and a narrative of the reclamation activities. Refer to 19.15.29.13 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: Chance Dixon Title: Project Manager Email: cdixon@vertex.ca Date: 11/18/2024

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QUESTIONS (continued)

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

QUESTIONS

Revegetation Report	
Only answer the questions in this group if all surface restoration, reclamation and re-vegetation obligations have been satisfied.	
Requesting a restoration complete approval with this submission	No
Per Paragraph (4) of Subsection (D) of 19.15.29.13 NMAC for any major or minor release containing liquids, the responsible party must notify the division when reclamation and re-vegetation are complete.	

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CONDITIONS

Operator: TAP ROCK OPERATING, LLC 523 Park Point Drive Golden, CO 80401	OGRID: 372043
	Action Number: 404515
	Action Type: [C-141] Reclamation Report C-141 (C-141-v-Reclamation)

CONDITIONS

Created By	Condition	Condition Date
nvelez	None	3/4/2025