



Topsoil Protection Plan

Rule 304.c.(14)

Coyote Fed 0397-14

Section 14 T3N R97W 6<sup>th</sup> P.M.

Moffat County, Colorado

November 2022

## Topsoil Protection Plan

<b>Operator Location Name</b>	Coyote Fed 0397-14 Pad
<b>Federal Unit</b>	Wiley
<b>Legal Description</b>	NWNW Section 14, T3N-R97W
<b>Coordinates (Lat/Long)</b>	40.235177, -108.253509
<b>County</b>	Moffat

### Introduction

This Topsoil Protection Plan (Plan) was prepared for Anschutz Exploration Corporation (Anschutz) by Confluence Compliance Companies, LLC (Confluence) to support permitting efforts of the Coyote Fed 0397-14 well pad referenced above (Location) with the Colorado Oil and Gas Conservation Commission (COGCC). Methodologies and results of a topsoil analysis are detailed below along with a description of the location and pre-disturbance landscape. The following procedures will be implemented to ensure protection of soils through all phases of oil and gas exploration and production.

### Location

#### Site Description

The Location is within Indian Valley, approximately 22.6 miles northwest of Meeker, Colorado by road. The site is located on privately owned land in Section 14, Township 3 North, Range 97 West. Site aspect is south-southwesterly with slopes of one to two percent (%). The terrain surrounding the project consists of a valley bottom with ephemeral drainages and gullies. The project area is approximately 5,904 feet above mean sea level.

The Location's surface disturbance includes the well and facility pad and associated access road and pipeline right-of-ways (ROW). The well pad surface disturbance boundary area to support drilling, completions, and operations is approximately 6.818-acres. Of this, approximately 5.02-acres of surface will be disturbed. This 5.02-acre area constitutes the topsoil salvage area of the well pad disturbance. Approximately 13,481 feet of an existing two-track ranch road will be improved and approximately 605 feet of new road will be constructed for well pad access. Planned road ROW width is 70 feet with a total disturbance area of 21.66-acres. Pipeline installation will parallel the road with a ROW width of 30 feet and total disturbance area of 9.54-acres. The total access road and pipeline ROW disturbance area is 31.2-acres.

#### Soil Description

According to the United States Department of Agriculture (USDA) Web Soil Survey [1], the Location spans four Soil Map Units (SMU): SMU 204 - Typic Natrargids, 0 to 5 % slopes, SMU 93 – Gullied Lands, SMU 77 - Forelle loam, 3 to 12% slopes, and SMU 91 - Grieves-Yamo-Crestman association, 0 to 45% slopes.

#### SMU 204 - Typic Natrargids, 0 to 5 % Slopes

- The A horizon is typically a fine sandy loam texture, 0 to 2 inches in depth.

- The B horizon is typically a sandy clay loam texture 2 to 18 inches in depth.
- These soils are well drained with a medium runoff class and moderate available water supply.
- Depth to a restrictive feature or water table is more than 80 inches.
- Soils have a maximum sodium adsorption ration of 35.0 and slightly saline to strongly saline properties.

#### SMU 93 - Gullied Lands

- Soils are typically found in stream terraces and have variable horizon depths.
- The soils have a very high runoff class and typical slopes of 0 to 15%.

#### SMU 77 - Forelle loam, 3 to 12% slopes

- The A horizon is typically a loam texture 0 to 5 inches in depth.
- The B horizon is typically a clay loam texture 5 to 23 inches in depth.
- The soils are well drained with a medium runoff class and high available water supply.
- Depth to a restrictive feature or water table is more than 80 inches.
- Soils have a maximum calcium carbonate content of 15%, maximum sodium adsorption ration of 5.0, and non-saline to very slightly saline properties.

#### SMU 91 - Grieves-Yamo-Crestman association, 3 to 45% slopes

- The A horizon is typically a loamy fine sand texture 0 to 2 inches in depth.
- The B horizon is typically a fine sandy loam texture 2 to 60 inches in depth.
- The soils are somewhat excessively drained with a low runoff class and moderate available water supply.
- Depth to a restrictive feature or water table is more than 80 inches.
- Soils have a maximum calcium carbonate content of 10% and non-saline to very slightly saline properties.

## **Topsoil Evaluation Methods**

### **Field Assessment**

The field assessment consists of a site evaluation and soil pit analysis. Prior to field assessments, Soil Mapping Units and disturbance boundaries are mapped and potential soil pit locations are identified. While on Location, Confluence assesses mapped soil pit locations and modifies as needed based on field conditions to ensure pre-disturbance soil pits best represent potential variations in topsoil depth. Topsoil depths were calculated by digging soil test pits in undisturbed areas. Topsoil depth analyses were completed using Natural Resource Conservation Service (NRCS) Field Book for Describing and Sampling Soils methods [2]. Master horizons were identified based on physical characteristics and recorded at each reference area soil pit. Pit locations were collected using a handheld GPS unit with submeter accuracy. For the purposes of this analysis, topsoil is considered the O and A horizons. Transitional horizons were not evaluated in detail.

### **Desktop Analysis**

Following the field assessment, field data was used to estimate topsoil depths across the disturbance boundaries. The topsoil depths are compared to planned disturbance acreages to estimate volumes of topsoil to be salvaged.

## Results

The attached Site Diagrams depict the 8 soil pits analyzed and the associated topsoil depths within the planned disturbance boundaries, as well as soil map units. Topsoil depths were found to range from four to six inches within the proposed disturbance areas. Soil horizon transitions were non-abrupt with limited color and texture change, as depicted in the attached Photo Log. Topsoil was identified based on three primary physical characteristics: Soil density, fine root density, and organic matter content. Topsoil was found to have sandy loam to loam textures and limited organic matter content.

Regions of the planned disturbance area with less than 6 inches of topsoil have seedbed quality soils to depths of 6 inches and greater. Though the existing two-track road has light compaction the physical topsoil characteristics remain, soils are of seedbed quality, and should be salvaged. Per COGCC Rule 1002.b.(2), the top six inches of soil shall be separated, stored, and protected until redistributed during interim reclamation operations.

The below table identifies estimates for topsoil salvage volumes on the well pad and the access road and pipeline ROW.

<b>Topsoil Salvage Estimate</b>	
<b>Proposed Well Pad</b>	
Topsoil Stripping Area	5.02 Acres
Topsoil Stripping Depth	6 Inches
Cubic Yards (CY) of Topsoil (Salvage Volume)	4,049.5
<b>Proposed Access Road and Pipeline ROW</b>	
Topsoil Stripping Area	31.2 Acres
Topsoil Stripping Depth	6 Inches
Cubic Yards (CY) of Topsoil (Salvage Volume)	25,168.0

Minimal rock was identified within the soils to be salvaged. The existing two-track has limited ranch traffic, low compaction, and viable topsoil through most of the reach. All soils are found to be salvageable throughout the planned disturbance area.

## Topsoil Protection Procedures

Throughout construction, drilling, completions, and interim reclamation/production phases, soils will be removed, handled, stockpiled, and maintained to prevent degradation from contamination, erosion, compaction, and to the extent possible, loss of biological activity. Stormwater control measures and Best Management Practices (BMPs) will be implemented to ensure topsoil protection. Topsoil will be monitored regularly by Anschutz personnel and during routine stormwater inspections. During construction, drilling, and completions operations, stormwater inspections will occur on a 14-day frequency and within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion.



## Construction

Topsoil will be salvaged from the construction area to a depth of 6 inches. 4,049.5 cubic yards (CY) of topsoil will be salvaged from the well pad disturbance area and stored along the northern and eastern perimeters in a stockpile with slopes no greater than 3:1. The stockpiles will be marked and clearly identified. Salvaged topsoil will be seeded with the below seed mix while stockpiled during drilling and well completions operations. Hydroseeding or broadcast seeding will be used in conjunction with a hydromulch tackifier when earthwork operations are complete.

<b>BLM White River Field Office Seed Mix #7 + Cover Crop</b>			
<b>Cultivar</b>	<b>Species</b>	<b>Scientific Name</b>	<b>Application Rate (Broadcast Rate) lbs. PLS/Acre</b>
VNS	Letterman needlegrass	<i>Elymus lanceolatus ssp. Lanceolatus</i>	6
San Luis	Slender Wheatgrass	<i>Elymus trachycaulus ssp. Trachycaulus</i>	4
Whitmar	Bluebunch Wheatgrass	<i>Pseudoroegneria spicata ssp. Inermis</i>	8
Sodar	Streambank Wheatgrass	<i>Elymus lanceolatus ssp. Psammophilus</i>	6
UP Plateau	Sandberg Bluegrass	<i>Poa secunda ssp. Sandbergii</i>	1
VNS / Quickguard	Oats (Fall Planting) / Tridicale (Spring Planting)	<i>Avena sativa / Triticum aestivum X Secale cereale</i>	10
VNS	Scarlet Globemallow	<i>Sphaeralcea coccinea</i>	0.5
VNS	Sulfur Flower Buckwheat	<i>Eriogonum umbellatum</i>	0.5
<b>Total</b>			<b>36</b>

Topsoil will be salvaged from the access road and pipeline disturbance area to a depth of 6 inches. An estimated 25,168.0 CY of topsoil will be windrowed along the perimeter in a temporary stockpile with slopes no greater than 3:1.

## Drilling and Well Completions

During normal operations and stormwater inspections, Anschutz employees and contractors will monitor topsoil stockpiles for erosion and establishment of undesirable and noxious weeds. Weeds will be treated mechanically when feasible. Chemical treatment of weeds will use broad-leaf herbicides only. Soil sterilant and non-selective herbicides will not be used. Erosion will be repaired as soon as practicable and additional control measures will be installed as necessary to prevent reoccurrence.

## Interim Reclamation and Production

When the Location enters the production phase of operations, areas no longer in use will be interim reclaimed. Topsoil will be redistributed throughout the interim reclamation area and contoured to match pre-disturbance topography. The access road and pipeline topsoil will be redistributed for pipeline reclamation, with greater topsoil placed on the access roadside of the reclaim for future use during final reclamation. The redistributed soils will be tilled to adequately prepare the seedbed for seeding operations. The interim reclamation area will be seeded with a mix approved by the surface owner and temporarily stabilized with crimped straw mulch.

Topsoil will continue to be monitored during 30-day stormwater inspections conducted until the disturbance meets the 70% of reference area cover specified for achieving final stabilization under applicable stormwater CDPHE stormwater permit requirements. Topsoil protection, weed management and erosion control/repair will continue throughout the life of the Location per Anschutz best management practices and COGCC 1000 Series Rules.

Throughout all phases of development, any identified erosion will be repaired as soon as practicable. Additional stormwater control measures will be deployed as needed. All deployed temporary stormwater control measures will be maintained and will remain in place until the disturbance achieves final stabilization and successful interim reclamation as defined in the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division COR400000 permit and COGCC Rule 1003.e.

## Topsoil Protection Best Management Practices

### Pre-disturbance Soil Evaluation

- The Location spans four Soil Map Units (SMU): SMU 204 - Typic Natrargids, 0 to 5 % slopes, SMU 93 – Gullied Lands, SMU 77 - Forelle loam, 3 to 12% slopes, and SMU 91 - Grieves-Yamo-Crestman association, 0 to 45% slopes.
- Soil pits were evaluated to determine pre-disturbance soil horizon depths.
- Topsoil samples were collected for laboratory analysis to determine pre-disturbance agronomic characteristics.
- Pre-disturbance topsoil depth was used to estimate topsoil salvage volumes.

### Topsoil Protection Procedures

- Topsoil will be salvaged from the construction area to a depth of 6 inches.
- Topsoil will be stockpiled with slopes no greater than 3:1.
- Stockpiles will marked and clearly identified.
- Salvaged topsoil will be seeded and stabilized with mulch while stockpiled.
- Anschutz employees and contractors will monitor topsoil stockpiles for erosion and establishment of undesirable and noxious weeds.
- Weeds will be treated mechanically when feasible. Chemical treatment of weeds will use broad-leaf herbicides only. Soil sterilant and non-selective herbicides will not be used.
- Erosion will be repaired as soon as practicable and additional control measures will be installed as necessary to prevent reoccurrence.
- During reclamation, topsoil will be redistributed throughout the interim reclamation area and contoured to match pre-disturbance topography.
- The interim reclamation area will be seeded with a mix approved by the surface owner and temporarily stabilized with crimped straw mulch.

- Topsoil will be monitored throughout all phases of development to identify potential degradation and make repairs as soon as practicable.

The analysis presented here was completed by Confluence Reclamation Specialists. This Plan summarizes Anschutz standard operating procedures for topsoil protection as well as information relevant to topsoil protection acquired from publicly available databases and records analyzed by Confluence Compliance Companies, LLC.

## Attachments

- Topsoil Evaluation Site Diagrams
- Photo Log – Photo Illustrations of Topsoil Evaluation
- Topsoil Agronomic Laboratory Analysis Results

## References

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. <http://websoilsurvey.sc.egov.usda.gov/>. Accessed [June 22, 2022].

Soil Survey Staff, National Soil Survey Center, Natural Resources Conservation Service, U.S. Department of Agriculture. Field Book for Describing and Sampling Soils, Version 3.0. [Field Book for Describing and Sampling Soils; Version 3.0; 2021 Reprint \(usda.gov\)](#). Accessed (November 2021).



SMU 204  
Typic Natrargids, 0 to 5% slopes

## Topsoil Evaluation Site Diagram - Proposed Well and Facility Pad

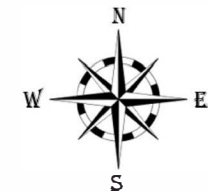
Anschutz Exploration Corporation

Coyote Fed 0397-14





COGCC Location ID: Pending

Moffat County

NWNW Section 14, T3N-R 97W



### Legend

-  Soil Pit
-  Proposed Well and Facility Pad Disturbance Area
-  Proposed Access Road and Pipeline Disturbance Area
-  Soil Map Unit (SMU) Boundaries

Spatial data was collected using a handheld GPS unit with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. The position of illustrated data may have been manually adjusted to align with the aerial imagery in a manner more representative of field conditions for presentation purposes only.

Map created by Adam Roll on 07/25/2022.

Soil Pit 2  
6.0" Topsoil Depth

Soil Sample Point  
0 - 6" Depth  
(220722\_Coyote\_Pit\_1)

Soil Pit 1  
5.5" Topsoil Depth

Soil Sample Point  
0 - 6" Depth  
(220722\_Coyote\_Pit\_4)

Soil Pit 4  
6.0" Topsoil Depth

Soil Pit 3  
5.5" Topsoil Depth

500 ft



SMU 204  
Typic Natrargids,  
0 to 5% slopes

SMU 93  
Gullied land

Indian Valley

SMU 77  
Forelle loam, 3 to 12% slopes

SMU 77  
Forelle loam,  
3 to 12% slopes

SMU 91  
Grieves-Yamo-Crestman association,  
3 to 45% slopes

Soil Pit 5  
5.5" Topsoil Depth

Soil Sample Point  
0 - 6" Depth  
(220722\_Coyote\_Pit\_6)

Soil Pit 6  
4.0" Topsoil Depth

Soil Pit 7  
4.0" Topsoil Depth

Soil Sample Point  
0 - 6" Depth  
(220722\_Coyote\_Pit\_8)

Soil Pit 8  
4.5" Topsoil Depth

## Topsoil Evaluation Site Diagram - Proposed Access Road and Pipeline ROW

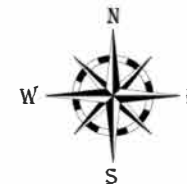
### Anschutz Exploration Corporation

Coyote Fed 0397-14





COGCC Location ID: Pending

Moffat County

NNW Section 14, T3N-R97W



### Legend

-  Soil Pit
-  Proposed Well and Facility Pad Disturbance Area
-  Proposed Access Road and Pipeline Disturbance Area
-  Soil Map Unit (SMU) Boundaries

Spatial data was collected using a handheld GPS unit with submeter accuracy. Illustration discrepancies may be present in this diagram due to the inherent limitations of data accuracy for both project data and the underlying aerial imagery. The position of illustrated data may have been manually adjusted to align with the aerial imagery in a manner more representative of field conditions for presentation purposes only.

Map created by Adam Roll on 07/25/2022.

3000 ft

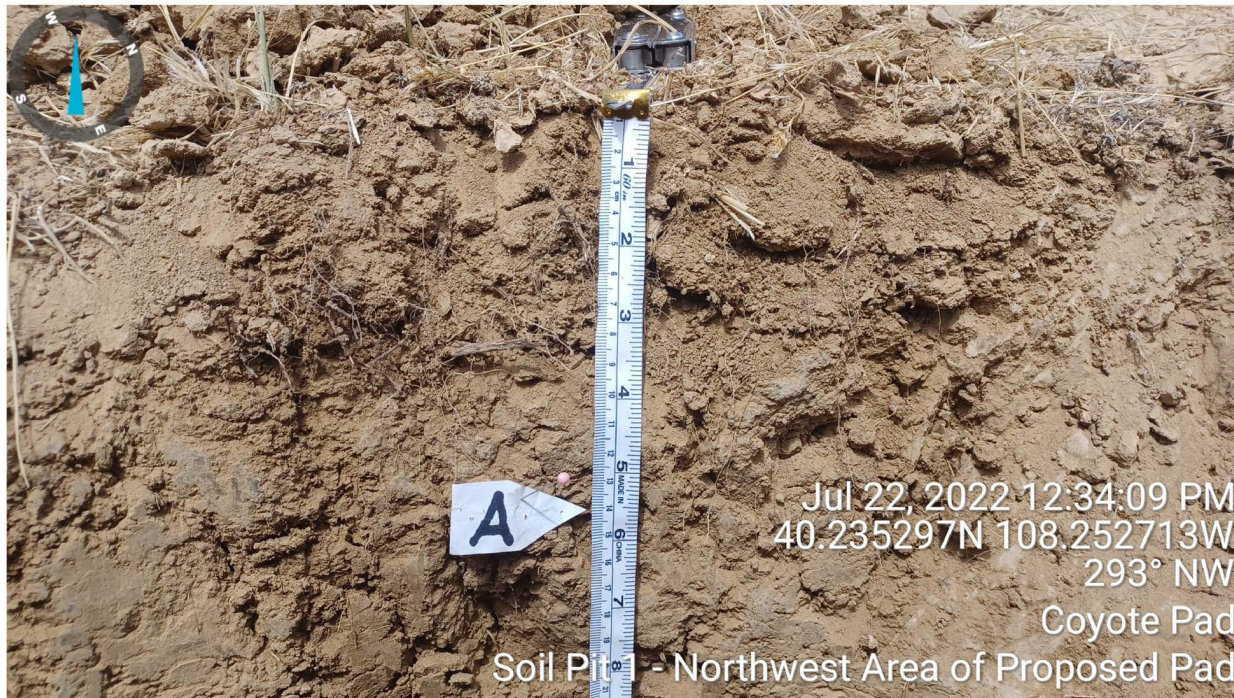




## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 1 of 8



Soil Pit 1 - Northeast Area of Proposed Well and Facility Pad (A and B Markers Indicate Terminal of Horizons)





## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 2 of 8



Soil Pit 2 - Northwest Area of Proposed Well and Facility Pad (A and B Markers Indicate Terminal of Horizons)

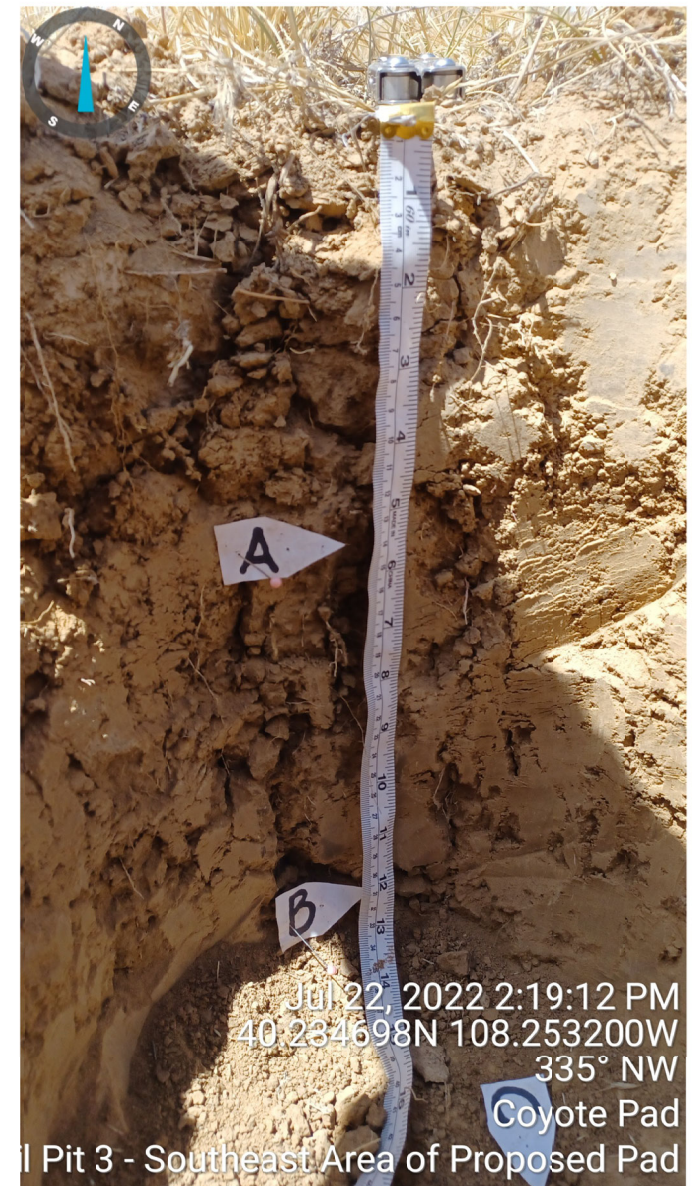




## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 3 of 8



Soil Pit 3 - Southeast Area of Proposed Well and Facility Pad (A and B Markers Indicate Terminal of Horizons)





## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 4 of 8



Soil Pit 4 - Southwest Area of Proposed Well and Facility Pad (A and B Markers Indicate Terminal of Horizons)





## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 5 of 8



Soil Pit 5 - Western Region of Proposed Access Road and Pipeline ROW (Markers Indicate Terminal of Horizons)





## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 6 of 8



Soil Pit 6 - West-Central Region of Proposed Access Road and Pipeline ROW (A Marker Indicates Terminal of Horizon)





## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 7 of 8



Soil Pit 7 - East-Central Region of Proposed Access Road and Pipeline ROW (A Marker Indicates Terminal of Horizon)





## Photo Illustrations of Topsoil Evaluation

Coyote Fed 0397-14-3-1 NH (COGCC Location ID Pending)

Page 8 of 8



Soil Pit 8 - Eastern Region of Proposed Access Road and Pipeline ROW (A Marker Indicates Terminal of Horizon)



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**September 20, 2022**

## Confluence Compliance Companies

**Attn: Adam Roll**

**403 ½ Rockwood Lane**

**Grand Junction, CO 81507**

Laboratory No. Sample ID	E22207-1A Pit1 220722_Coyote	Extraction Method
Sodium (ppm)	123.8	Saturated Paste
Calcium (ppm)	33.55	
Magnesium (ppm)	8.75	
pH	7.85	
EC (mS/cm)	0.611	
Saturated Paste %	49.30	
SAR	4.92	
Nitrate-N (ppm)	1.40	AB-DPTA
Phosphorus (ppm)	2.58	
Potassium (ppm)	225.4	
Copper (ppm)	1.94	
Iron (ppm)	18.4	
Manganese (ppm)	2.8	
Zinc (ppm)	0.5	
Ammonia-N (ppm)	2.8	KCl Water
Chloride (ppm)	19.3	
Boron (ppm)	1.1	Walkley-Black
Sand (%)	14.6	
Fine Sand (%)	9.5	
Silt (%)	62.9	
Clay (%)	13.1	
Classification	SILT LOAM	
Organic Matter (%)	1.0	
% CaCO <sub>3</sub> -C equivalent	0.06	
CEC (meq/100g)	37.69	
ESP (%)	1.43	

  
Project Manager

9-20-22  
Date

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September 20, 2022


## Confluence Compliance Companies

Attn: Adam Roll

403 ½ Rockwood Lane

Grand Junction, CO 81507

Laboratory No. Sample ID	E22207-1B Pit4 220722_Coyote	Extraction Method
Sodium (ppm)	941.25	Saturated Paste
Calcium (ppm)	39	
Magnesium (ppm)	24.1	
pH	8.4	
EC (mS/cm)	3.77	
Saturated Paste %	54.85	
SAR	29.21	
Nitrate-N (ppm)	0.70	AB-DPTA
Phosphorus (ppm)	5.43	
Potassium (ppm)	207.5	
Copper (ppm)	1.86	
Iron (ppm)	19.4	
Manganese (ppm)	2.9	
Zinc (ppm)	0.5	
Ammonia-N (ppm)	2.8	KCl Water
Chloride (ppm)	108.5	
Boron (ppm)	0.6	Walkley-Black
Sand (%)	9.2	
Fine Sand (%)	12.3	
Silt (%)	67.6	
Clay (%)	10.8	
Classification	SILT LOAM	
Organic Matter (%)	1.1	
% CaCO <sub>3</sub> -C equivalent	0.78	
CEC (meq/100g)	33.87	
ESP (%)	12.09	

  
Project Manager

  
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**September 20, 2022**

## Confluence Compliance Companies

**Attn: Adam Roll**

**403 ½ Rockwood Lane**

**Grand Junction, CO 81507**

Laboratory No. Sample ID	E22207-1C Pit6 220722_Coyote	Extraction Method
Sodium (ppm)	38.94	Saturated Paste
Calcium (ppm)	88.66	
Magnesium (ppm)	46.805	
pH	7.01	
EC (mS/cm)	0.88	
Saturated Paste %	30.47	
SAR	0.83	
Nitrate-N (ppm)	1.13	AB-DPTA
Phosphorus (ppm)	6.79	
Potassium (ppm)	183.8	
Copper (ppm)	1.86	
Iron (ppm)	18.3	
Manganese (ppm)	4.7	
Zinc (ppm)	0.7	
Ammonia-N (ppm)	6.0	KCl Water
Chloride (ppm)	110.8	
Boron (ppm)	0.2	Walkley-Black
Sand (%)	57.2	
Fine Sand (%)	14.5	
Silt (%)	19.4	
Clay (%)	9.0	
Classification	SANDY LOAM	
Organic Matter (%)	1.5	
% CaCO <sub>3</sub> -C equivalent	0.20	
CEC (meq/100g)	11.56	
ESP (%)	1.46	

  
Project Manager

  
Date



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**September 20, 2022**

**Confluence Compliance Companies**

**Attn: Adam Roll**

**403 ½ Rockwood Lane**

**Grand Junction, CO 81507**

Laboratory No. Sample ID	E22207-1D Pit8 220722_Coyote	Extraction Method
Sodium (ppm)	17.55	Saturated Paste
Calcium (ppm)	43.05	
Magnesium (ppm)	24.7	
pH	6.46	
EC (mS/cm)	0.474	
Saturated Paste %	30.80	
SAR	0.53	
Nitrate-N (ppm)	0.66	AB-DPTA
Phosphorus (ppm)	1.52	
Potassium (ppm)	137.7	
Copper (ppm)	1.58	
Iron (ppm)	16.0	
Manganese (ppm)	4.3	
Zinc (ppm)	0.5	
Ammonia-N (ppm)	1.2	KCl Water
Chloride (ppm)	15.6	
Boron (ppm)	< 0.1	
Sand (%)	51.0	
Fine Sand (%)	13.6	
Silt (%)	21.5	
Clay (%)	13.8	
Classification	SANDY LOAM	
Organic Matter (%)	1.1	Walkley-Black
% CaCO <sub>3</sub> -C equivalent	0.19	
CEC (meq/100g)	17.15	
ESP (%)	0.45	

  
Project Manager

  
Date