Topsoil Protection Plan

North Cheyenne
Oil and Gas Development

Pfaffly 1-12

This Topsoil Protection Plan has been prepared by Navex Resources, LLC (Navex) for its North Cheyenne Pfaffly 1-12 Oil and Gas Location in Kit Carson County, Colorado. The Plan addresses the Colorado Oil & Gas Conservation Commission (COGCC) requirement at Rule 304.c.(14) to prepare a Topsoil Protection Plan consistent with Rule 1002 and COGCC guidance.

1.0 Certification

The Topsoil Protection Plan has been prepared under the supervision of a person with relevant expertise.

Bruce Thomas, Operations Manager — 5/26/22 Date

2.0 Disturbance Acreage

The extent of the disturbed area is shown on the Form 2A, Construction Layout Drawing and Form 2A, Related Location and Flowline Map. The figures show the Oil and Gas Location, access road, and off-location flowline. The estimated disturbance acreages are listed in Table 1.

Table 1. Estimated Disturbance Acreages

Area	Estimated Acreage	Description
Oil and Gas Location	3.00	New Disturbance
Access Road	0.50	New Disturbance
Flowline[1]	0.003	New Disturbance
TOTAL	3.50	

[1]A 2-inch diameter flowline will be buried for approximately 200 feet south of the location to a tie in with the Ladder Creek Gathering System operated by Tumbleweed Midstream.

3.0 Soil Types

The Natural Resource Conservation Service (NRCS) soil type at the Oil and Gas Location is:

52: Norka, silt loam, 0 to 3 percent slopes

56: Norka-Colby, silt loams, 5 to 15 percent slopes

The access road will be constructed in:

52: Norka, silt loam, 0 to 3 percent slopes

The flowline will be constructed in:

52: Norka, silt loam, 0 to 3 percent slopes

A Soil Unit Map and NRCS soil unit descriptions are provided with the Form 2A.

4.0 Soil Evaluation

A topsoil pit evaluation was conducted at the proposed Oil and Gas Location (Figure 1). The results of the onsite evaluation are shown in Table 2 and Figures 1 and 2. Topsoil depth is approximately 2 to 3 inches. Results of soil sample analysis conducted by an accredited lab are provided in Attachment 1.

Table 2. Topsoil Pits

	Topsoil Pit 2-1		Topsoil Pit 2-2
Location	39.104192, -102.516471	**Location**	39.103429, -102.517375
Soil Units	56: Norka-Colby	**Soil Units**	52: Norka
0" - 2"	Silty clay loam, granular structure	**0" - 2"**	Silty clay loam, granular structure
2" - 8"	Loamy clay, blocky structure	**2" - 9"**	Clay, blocky structure
8" - 16"	Loamy clay loam, blocky structure	**9" - 13"**	Dual matrix clay, massive structure
Organic Matter	None observed	**Organic Matter**	None observed
Hard Pan	16"	**Hard Pan**	13"

Figure 1. Topsoil Pit 2-1

Figure 2. Topsoil Pit 2-2

5.0 Topsoil Stockpile Location

The topsoil stockpile location is shown on the Construction Layout Drawing and on the Soil Test Pit Location Map.

6.0 Topsoil to be Salvaged

The Oil and Gas Location will disturb portions of a 3.0-acre area. Current land use is dryland farming. An estimated 1,140 cubic yards of topsoil will be salvaged. Salvaged topsoil will be mounded on the Oil and Gas Location with a slope of approximately 1:3. The maximum height of the stockpile will be an estimated 12 feet. Areas for disturbance will be cleared of stubble from past crops. Topsoil will be stripped and segregated based on characteristics, such as texture, color, structure, and consistency. The topsoil will be protected by segregating it on the Oil and Gas Location. It will be marked with a labeled surveyor stake to distinguish it from the surrounding area. Navex will further protect the topsoil stockpile in the following ways:

Contamination

Navex will keep the area surrounding the stockpile clear of stored materials and vehicle parking.

Compaction

The topsoil stockpile will be placed on the edge of the Working Pad Surface to avoid the risk that equipment will be operated over the stockpile.

Wind and Water Erosion

The stockpile will be consolidated and mounded to minimize loose soils. It will be located on a portion of the Working Pad Surface that promotes natural drainage and avoids ponding and stormwater runnels. Surface roughening and an erosion control blanket will be used if needed to contain loose soils, while maintaining soil microbial activity.

A 2-inch gas flowline will be buried for approximately 200 feet south of the location to a tie in with the Ladder Creek Gathering System operated by Tumbleweed Midstream. The flowline trench will be an estimated 8 inches wide and 4 feet deep with approximately 3 feet of cover. Approximately 20 cubic yards of soil will be excavated for flowline installation. Soil will be windrowed along the flowline trench to be replaced over the flowline in the order that it was removed following installation and integrity testing.

7.0 Best Management Practices

Table 3. Best Management Practices

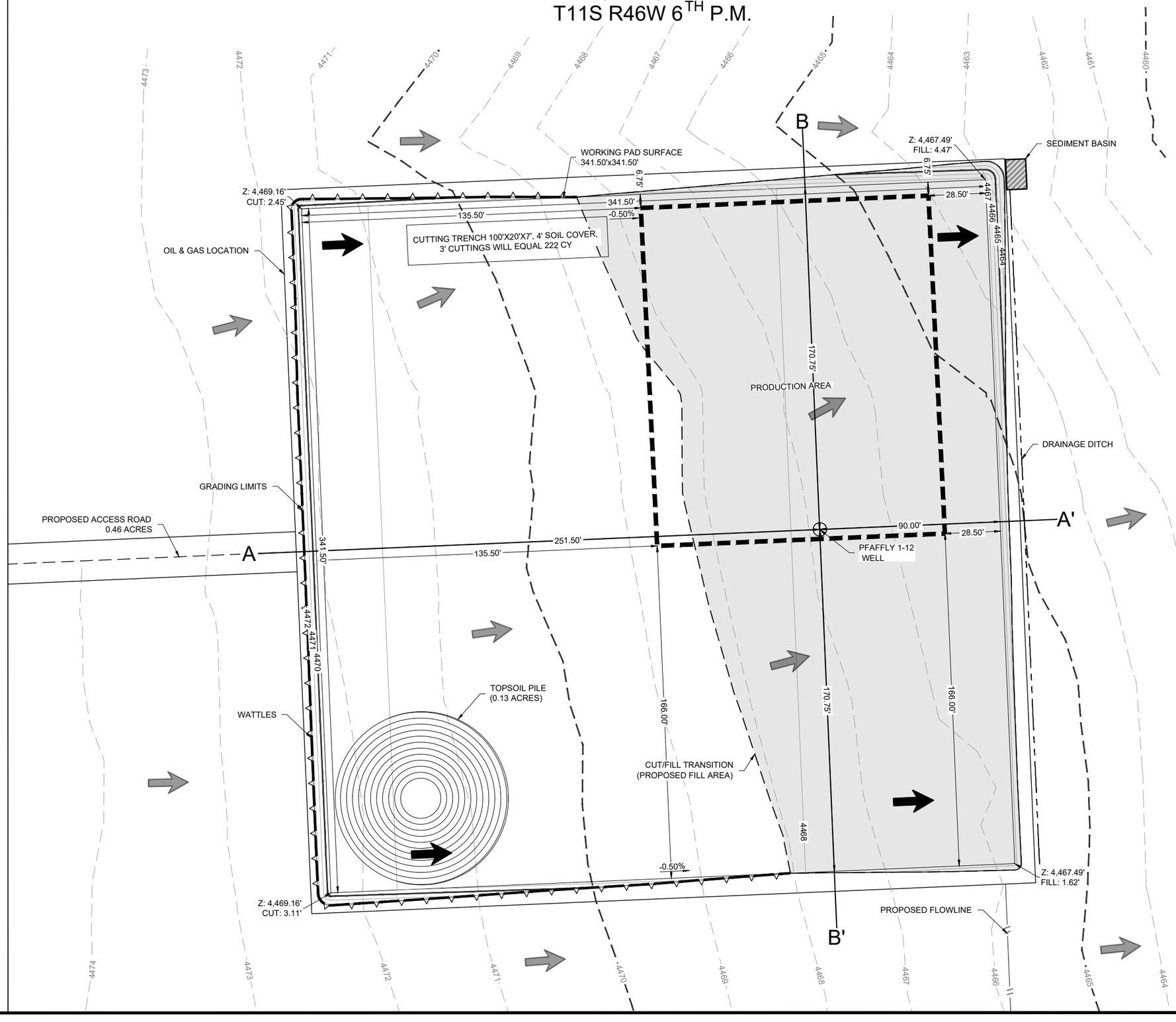
Short-Term
• Vegetation removal and soil disturbance on the Oil and Gas Location will be minimized to the area sufficient to site and level the drill rig, tanks, and equipment.
• The operator will salvage and segregate topsoil based on soil characteristics of texture, color, structure, and consistency.
• Salvaged topsoil will be mounded on the Oil and Gas Location to a maximum height of approximately 12 feet and a slope of approximately 1:3.
• Topsoil will be protected from contamination by stockpiling it in a location free from drilling, fuel storage, and parking.
• Soil removed during flowline trenching will be segregated based on changes in physical characteristics. The soil layers will be windrowed adjacent to the trench.
• Soils from the flowline trench will be replaced promptly in the order in which they were removed.
Long-Term
• The topsoil stockpile will be protected from compaction by designating it with surveyor staking and flagging as topsoil for reclamation.
• The topsoil stockpile will be protected from wind degradation by mounding at an approximately 1:3 steepness to prevent loose soils while promoting continued microbial activity.
• The topsoil stockpile will be protected from erosion by ensuring that stormwater controls and diversions are installed, where needed, to divert stormwater away from the stockpile.
• Surface roughening, crimped straw mulching, or an erosion control blanket will be used if needed to contain loose soils, while maintaining soil microbial activity.
• Vegetation will be allowed to establish on the topsoil stockpile to stabilize it, outcompete weeds, and promote soil microbial activity.

- The topsoil stockpile will be monitored and managed for weeds during weed management monitoring conducted at the Oil and Gas Location by the site operator.

Attachments

Construction Layout Drawing
Soil Test Pit Location Map
Soil Sample Analysis

KIT CARSON COUNTY
NW $\frac{1}{4}$ SW $\frac{1}{4}$ SEC. 12
T11S R46W 6TH P.M.



SCALE: 1" = 50'

0' 25' 50'

- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- WATTLES
- FILL AREA
- WELLHEAD
- PROPOSED DRAINAGE
- EXISTING DRAINAGE

WELLHEAD ELEVATIONS

GRADED ELEVATION:	4,467.93'
UNGRADED ELEVATION:	4,466.88'

EARTHWORK QUANTITIES:

CUT:	4,270 CY
FILL:	3,100 CY
TOPSOIL (3"):	1,140 CY
EXPORT:	30 CY
FILL FACTOR:	1.10

DISTURBANCE ACREAGES:

WORKING PAD SURFACE (AC):	2.68
OIL & GAS LOCATION (AC):	3.00
PROPOSED ACCESS ROAD (AC):	0.46
FLOWLINE ROW (AC):	0.003

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, STE. 146
FORT WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512
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CONSTRUCTION LAYOUT - PLAN VIEW

PFAFFLY #1-12

NAVEX RESOURCES, LLC

PRELIMINARY, THIS DOCUMENT SHALL NOT BE RECORDED FOR ANY PURPOSE AND SHALL NOT BE USED OR VIEWED OR RELIED UPON AS A FINAL ENGINEERING OR SURVEY DOCUMENT.

DATE:	05/05/22
DRAWN BY:	TJM
REVIEWED BY:	CCC
SCALE:	1" = 50'
SHEET :	1 OF 6

REVISION:		
XXX	XX/XX/XX	XXX
XXX	XX/XX/XX	XXX
XXX	XX/XX/XX	XXX

Pfaffly
1-12

52

56

Soil Test Pit 2-1
Topsoil Depth: 2-3"

Topsoil Pile

Soil Test Pit 2-2
Topsoil Depth: 2-3"

Aota Technical, LLC

NAVEX RESOURCES, LLC

Pfaffly 1-12

Soil Test Pit Location Map

Kit Carson County
NW1/4SW1/4 Sec. 12, T11S R46W 6th P.M.

Date
5/26/22

Legend

- Proposed Well
- Working Pad Surface
- Oil and Gas Location
- Parcels
- Public Road
- New Access Road
- Flowline Tie In to Ladder Creek Gathering System

NRCS Soil Survey

- Soil Map Unit
- 52: Norka silt loam, 0 to 3 percent slopes
- 56: Norka-Colby silt loams, 5 to 15 percent slopes

N

0 15 30 60 90 120
Feet

Data Source:
COGCC GIS Online
Natural Resources Conservation Service. Web Soil Survey

Colorado Analytical LABORATORIES, INC.

Soil Nutrient Laboratory Report

Lab No.: *211005023-01* **Date Rec:** *10/4/21* **Reported:** *10/21/21*	**Report To:** Jason Voight	**Company:** Topographic Land Surveyors 1400 Everman Pkwy Ste 146 Fort Worth TX 76107

Sample ID: *Site 2-1*

Project: *North Cheyenne*

Laboratory Results:

	Sample Result	Low----------Ave----------High
Field Texture (EST)	Silt Loam	
pH (units)	8.3	**********
Salts (MMHOS/CM)	1.0	**********
CEC Est. (MEQ/100G)	12.9	**********
Lime (Qual.)	Medium	**********
Organic Matter (%)	2.0	**********
Organic N (lbs/acre)	61.5	**********
Sodium (meq/100g Soil)	0.14	**
Available Nutrients (ppm)		
Nitrate Nitrogen	21.2	**********
Phosphorus	13.7	**********
Potassium	524.5	**********
Calcium	5220.0	**********
Magnesium	436.5	**********
Sulfur	3.1	**
Boron	0.4	
Zinc	0.4	*****
Iron	2.2	**********
Manganese	2.8	**********
Copper	0.8	**********

Note: Average Values are for Colorado Soils

Fertilizer Recommendations

General Landscape

Nitrogen:	*90 lbs/Acre*
Phosphorus - P2O5:	*60 lbs/Acre*
Potassium - K2O:	*0 lbs/Acre*
Sulfur SO4-S:	*60 lbs/Acre*
Lime:	*0 lbs/Acre*

**To convert recommendations to lbs/1000 sq. ft. divide by 40.*

Comments ***Split Nitrogen Recommendations 2 to 3 Times Throughout the Growing Season.***

Colorado Analytical LABORATORIES, INC.

Analytical Results

Report To: Jason Voight
Company: Topographic Land Surveyors
1400 Everman Pkwy
Ste 146
Fort Worth TX 76107

Task No: 211005023
Date Received 10/4/21
Reported: 10/21/21
Client PO:
Client Project: North Cheyenne

Customer Sample ID Site 2-1
Sample Date/Time: 10/1/21 8:30 AM

Lab Number: 211005023-01
Matrix: Soil - Environmental

Test	Result	Reporting Limit	Method	Date Analyzed	Analyzed By
Dry Weight Basis					
Chloride	**1.5 mg/kg**	0.1	USDA60 6(13)	10/13/21	AMJ
Sand	**22 %**	1	ASA1 43-5	10/20/21	HNB
Silt	**62 %**	1	ASA1 43-5	10/20/21	HNB
Clay	**16 %**	1	ASA1 43-5	10/20/21	HNB
USDA Texture	**Silt Loam**	0	ASA1 43-5	10/20/21	HNB
Soluble Nutrients - Dry Weight Basis					
Calcium	**8.7 meq/L**	0.1	USDA60 6 (20b)	10/15/21	MBN
Magnesium	**2.2 meq/L**	0.1	USDA60 6 (20b)	10/15/21	MBN
Sodium	**0.3 meq/L**	0.1	USDA60 6 (20b)	10/15/21	MBN
Sodium Adsorption Ratio	**0.1 units**	0.1	USDA60 6 (20b)	10/15/21	MBN

ASA = "Methods of Soil Analysis, Parts 1 and 2", Second Edition, American Society of Agronomy and Soil Science Society of America. Madison, WI, 1982.
SW-846 = "Test Methods for Evaluating Solid Waste"; USEPA; November 1986
AB-DTPA = "Soil Testing Methods Used at Colorado State University for the Evaluation of Fertility, Salinity and Trace Element Toxicity"; Colorado State University Technical Bulletin LTB88-2; Jan 1998; SM Workman, PN Soltanpour and RH Follett.

DATA APPROVED FOR RELEASE BY

10411 Heinz Way / Commerce City, CO 80640 / 303-659-2313
Mailing Address: P.O. Box 507 / Brighton, CO 80601-0507

211005023
1/9

Colorado Analytical LABORATORIES, INC.

Soil Nutrient Laboratory Report

Lab No.: *211005023-02* **Date Rec:** *10/4/21* **Reported:** *10/21/21*	**Report To:** Jason Voight	**Company:** Topographic Land Surveyors 1400 Everman Pkwy Ste 146 Fort Worth TX 76107

Sample ID: *Site 2-2*

Project: *North Cheyenne*

Laboratory Results:

	Sample Result	Low----------Ave----------High
Field Texture (EST)	Silt Clay Loam	
pH (units)	7.8	**********
Salts (MMHOS/CM)	1.2	*******
CEC Est. (MEQ/100G)	20.9	**********
Lime (Qual.)	Medium	**********
Organic Matter (%)	2.0	**********
Organic N (lbs/acre)	60.4	**********
Sodium (meq/100g Soil)	0.13	**
Available Nutrients (ppm)		
Nitrate Nitrogen	7.8	*******
Phosphorus	11.5	**********
Potassium	428.6	**********
Calcium	4234.5	**********
Magnesium	630.5	**********
Sulfur	3.5	***
Boron	0.5	*
Zinc	0.4	***
Iron	8.0	**********
Manganese	4.5	**********
Copper	0.9	**********

Note: Average Values are for Colorado Soils

Fertilizer Recommendations

General Landscape

Nitrogen:	*120 lbs/Acre*
Phosphorus - P2O5:	*60 lbs/Acre*
Potassium - K2O:	*0 lbs/Acre*
Sulfur SO4-S:	*60 lbs/Acre*
Lime:	*0 lbs/Acre*

**To convert recommendations to lbs/1000 sq. ft. divide by 40.*

Comments ***Split Nitrogen Recommendations 2 to 3 Times Throughout the Growing Season.***

Colorado Analytical LABORATORIES, INC.

Analytical Results

Report To: Jason Voight
Company: Topographic Land Surveyors
1400 Everman Pkwy
Ste 146
Fort Worth TX 76107

Task No: 211005023
Date Received 10/4/21
Reported: 10/21/21
Client PO:
Client Project: North Cheyenne

Customer Sample ID Site 2-2
Sample Date/Time: 10/1/21 8:30 AM

Lab Number: 211005023-02
Matrix: Soil - Environmental

Test	Result	Reporting Limit	Method	Date Analyzed	Analyzed By
Dry Weight Basis					
Chloride	**1.2 mg/kg**	0.1	USDA60 6(13)	10/13/21	AMJ
Sand	**18 %**	1	ASA1 43-5	10/20/21	HNB
Silt	**53 %**	1	ASA1 43-5	10/20/21	HNB
Clay	**29 %**	1	ASA1 43-5	10/20/21	HNB
USDA Texture	**Silt Clay Loam**	0	ASA1 43-5	10/20/21	HNB
Soluble Nutrients - Dry Weight Basis					
Calcium	**7.7 meq/L**	0.1	USDA60 6 (20b)	10/15/21	MBN
Magnesium	**3.4 meq/L**	0.1	USDA60 6 (20b)	10/15/21	MBN
Sodium	**0.8 meq/L**	0.1	USDA60 6 (20b)	10/15/21	MBN
Sodium Adsorption Ratio	**0.3 units**	0.1	USDA60 6 (20b)	10/15/21	MBN

ASA = "Methods of Soil Analysis, Parts 1 and 2", Second Edition, American Society of Agronomy and Soil Science Society of America. Madison, WI, 1982.
SW-846 = "Test Methods for Evaluating Solid Waste"; USEPA; November 1986
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