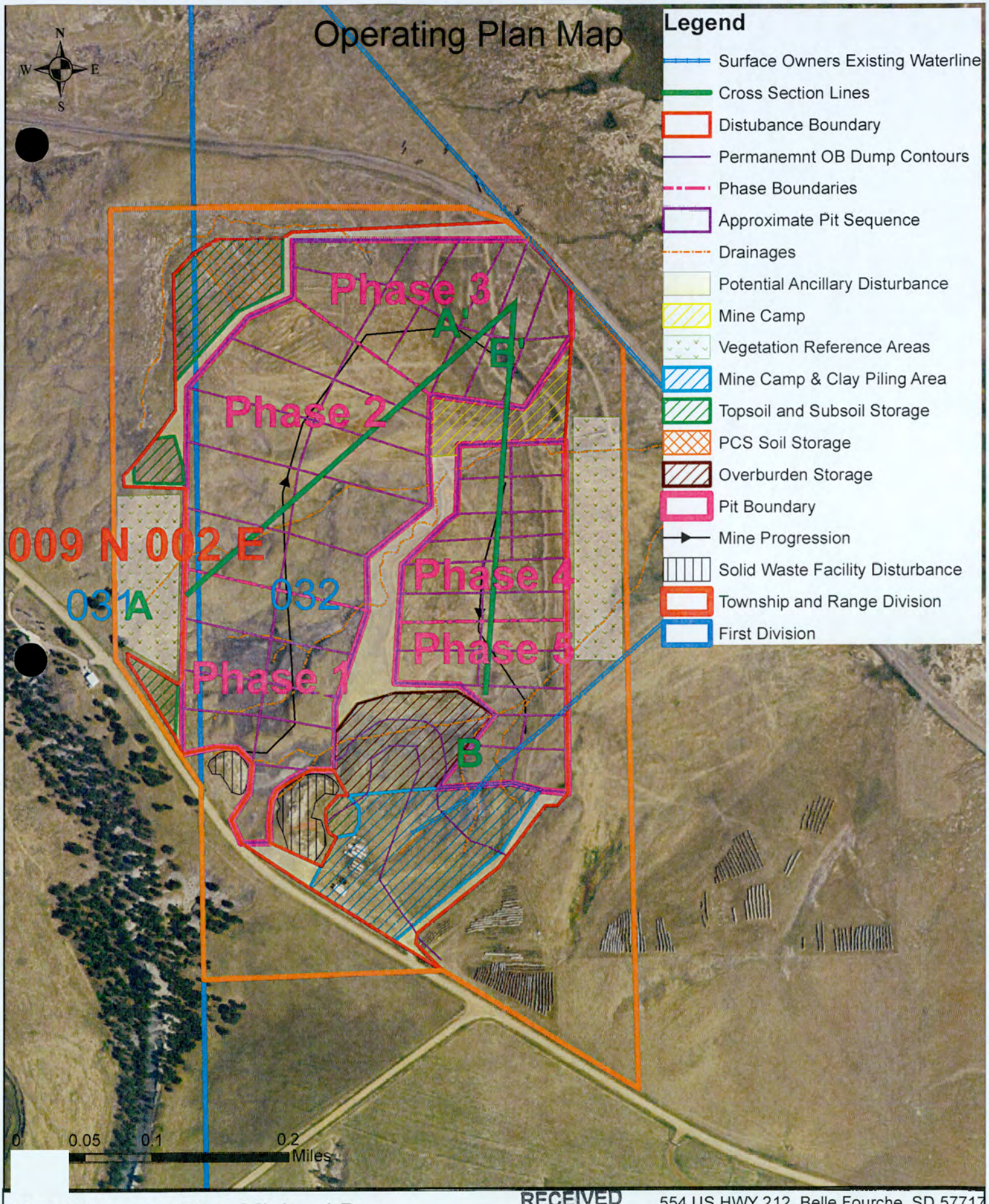
Appendix A

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Appendix A

BPM Security Bentonite Mine



Map Prepared By: Michael Barr

Date/Signature: 2/16/24

Map Criteria: 45-6B-10 (1 & 5), 74:29:02:09

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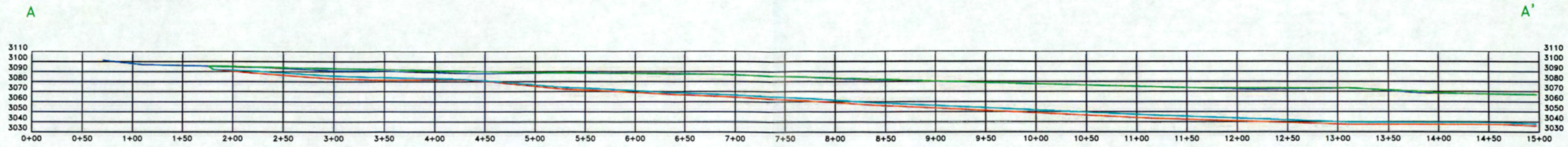
MINERALS & MINING PROGRAM

554 US HWY 212, Belle Fourche, SD 57717

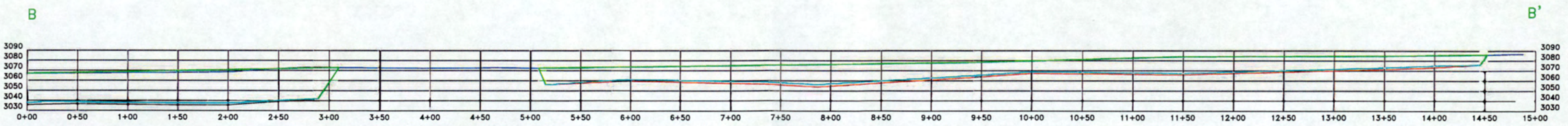
BENTONITE

Performance Minerals LLC

Operating Plan Cross Sections



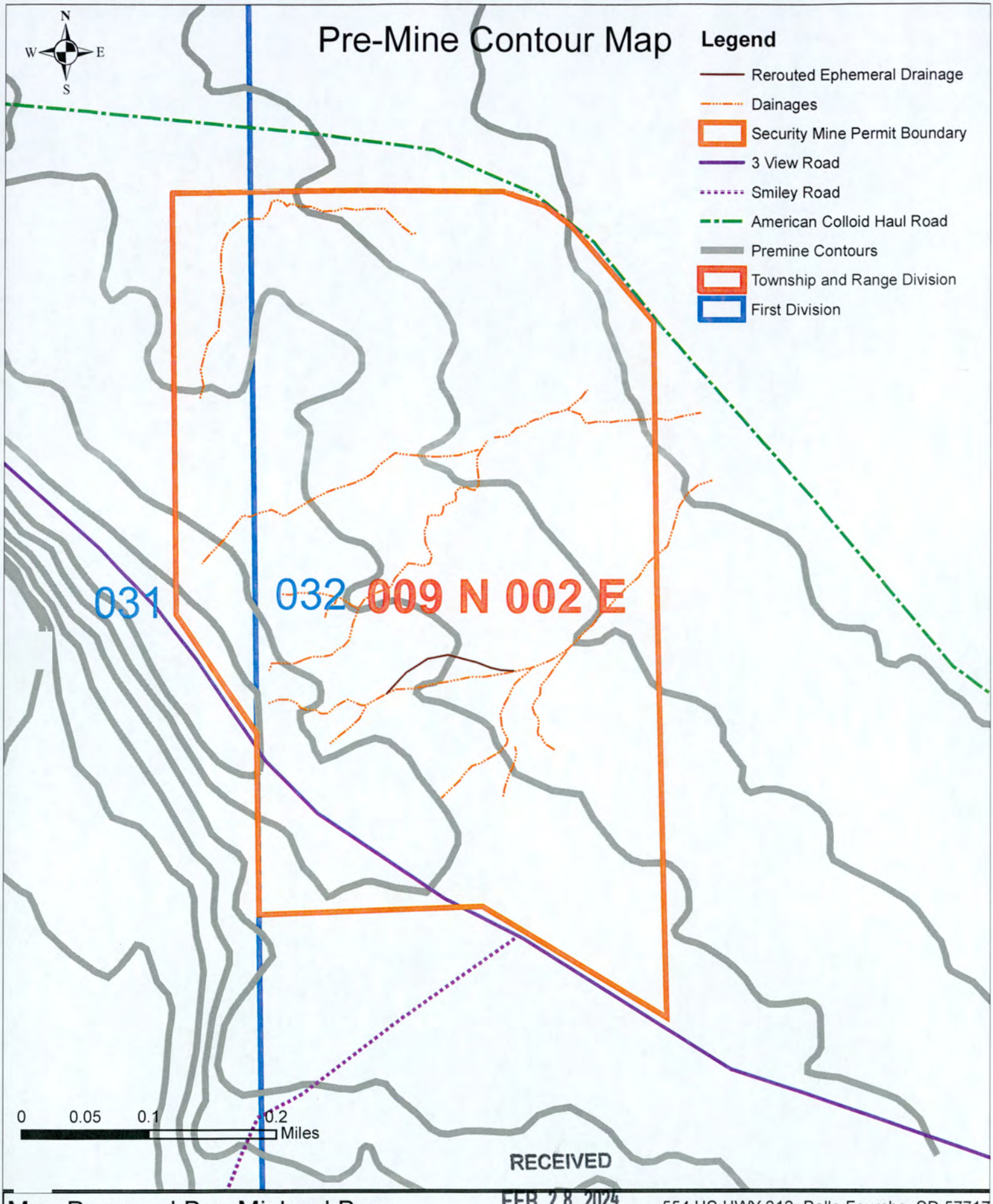
Ground Surface
Reclamation Surface
Bentonite Surface
Pit Floor



Stations are set to 50' increments

Created By: Michael Barr
Date:1/29/24
Criteria: ARSD 74:29:02:04 (2 &3), SDCL 45-6B-6 (8a)
Bentonite Performance Minerals, LLC

Pre-Mine Contour Map



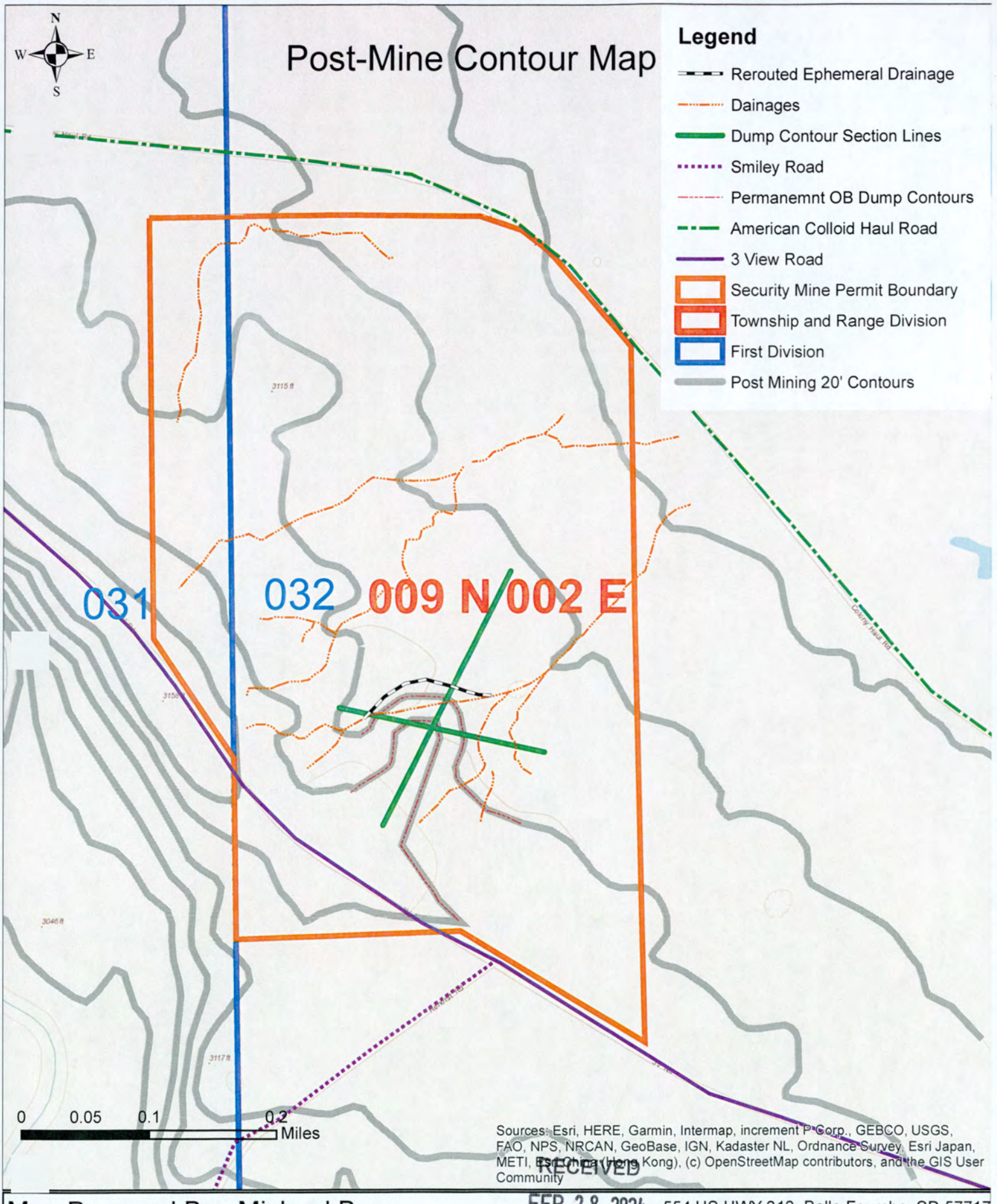
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Map Prepared By: Michael Barr
Date/Signature: 2/14/24
Map Criteria: ARSD 74:29:02:04(2), SDCL: 45-6B-6(8a)

554 US HWY 212, Belle Fourche, SD 57717

BENTONITE
Performance Minerals LLC

Post-Mine Contour Map



Legend

- Rerouted Ephemeral Drainage
- Dainages
- Dump Contour Section Lines
- Smiley Road
- Permanemnt OB Dump Contours
- American Colloid Haul Road
- 3 View Road
- Security Mine Permit Boundary
- Township and Range Division
- First Division
- Post Mining 20' Contours

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

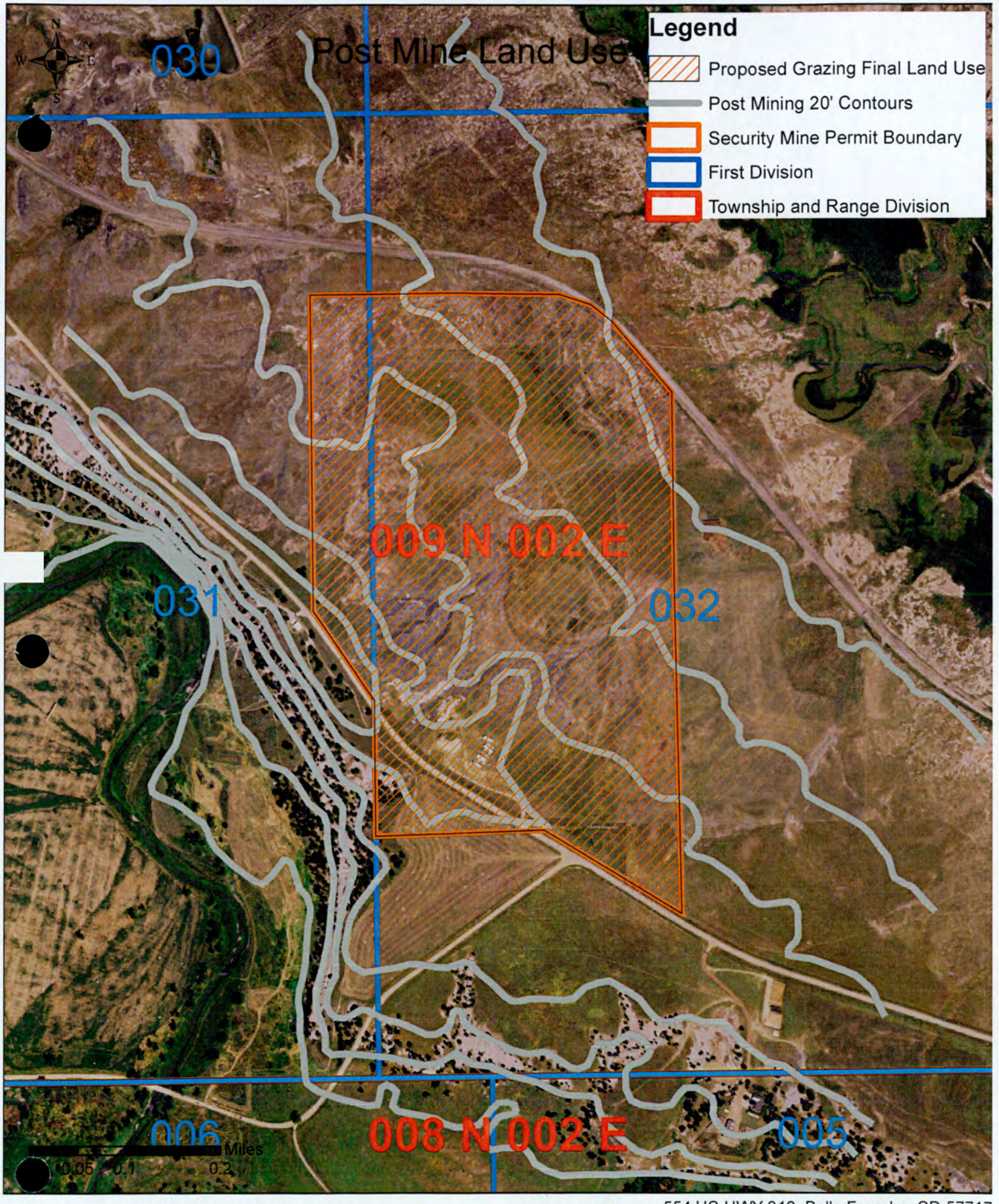
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Map Prepared By: Michael Barr
Date/Signature: 2/14/24 MBC
Map Criteria: 74:29:02:04(2), 45-6B-6(8a), 45-6B-7(8b)

554 US HWY 212, Belle Fourche, SD 57717

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BENTONITE
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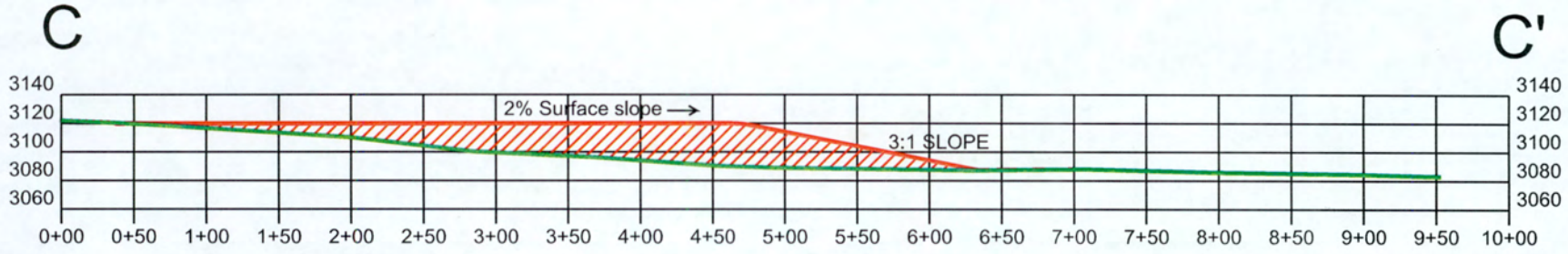
Map Prepared By: Michael Barr
Date/Signature: 2/14/24
Map Criteria: SDCL 45-6B-7 (8)

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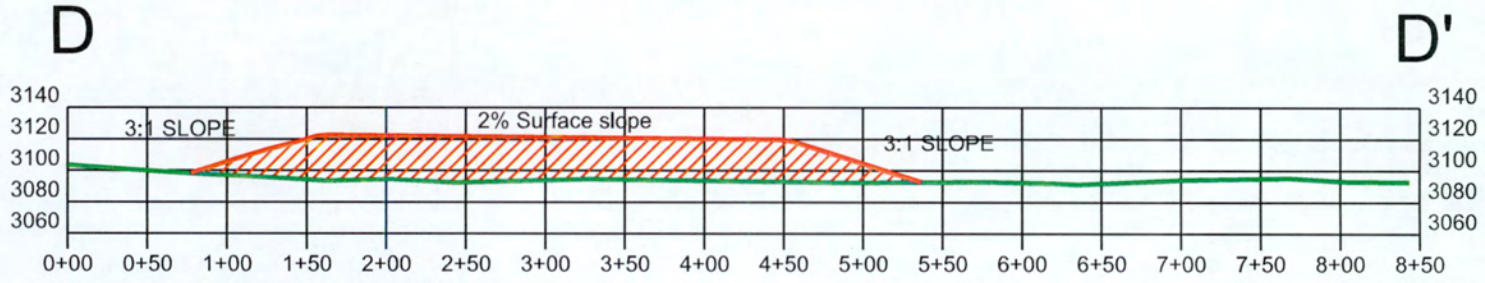
PERMANENT OB X-SECTION



Stations are set to 50' increments

Existing Surface

Reclaimed OB Stockpile Surface

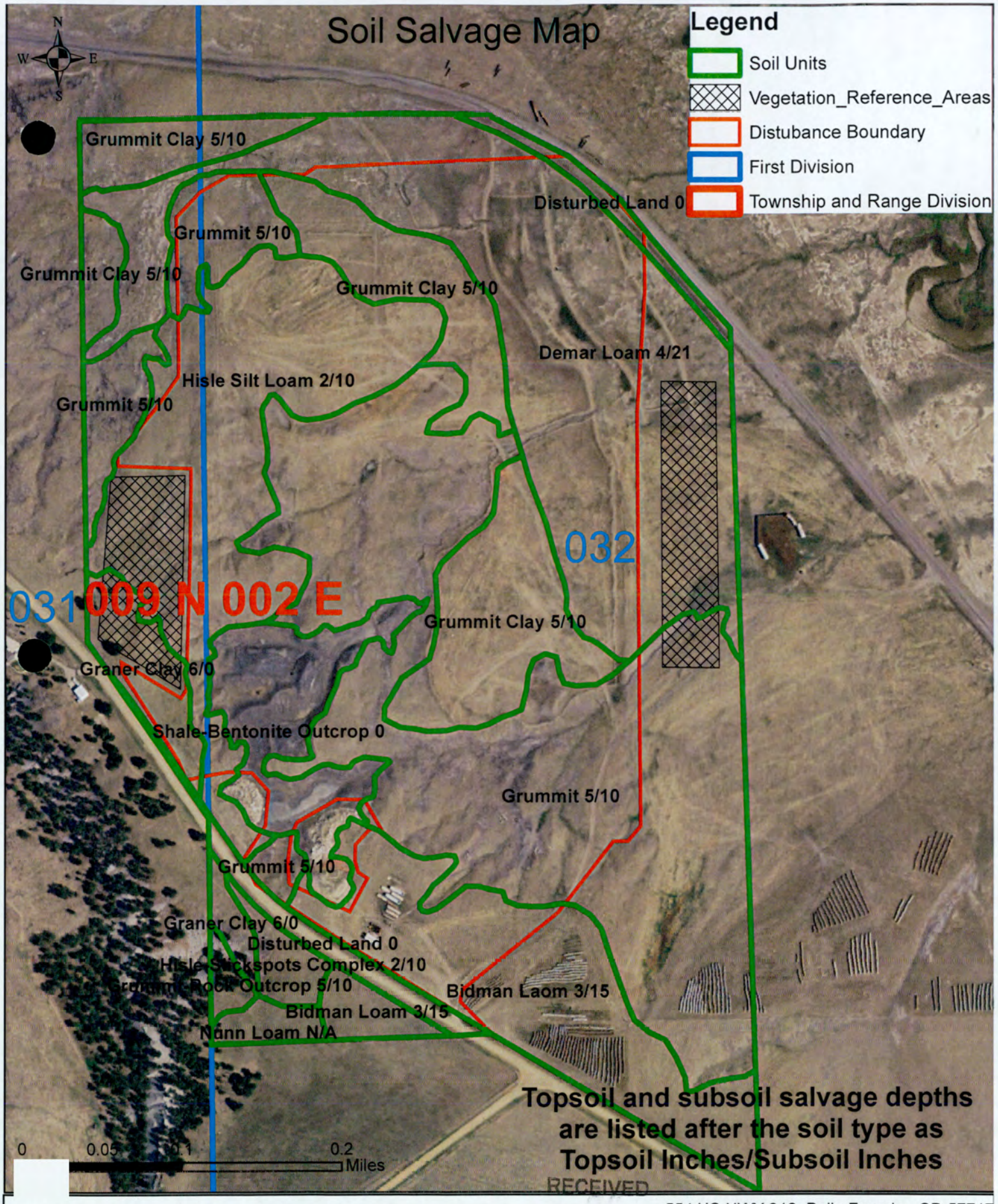


Completed By: Michael Bew

Date: 2/14/24

Criteria: ARSD 74:29:02:04 (2 & 3), SDCL 45-6B-6 (8a)

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Map Prepared By: Michael Barr

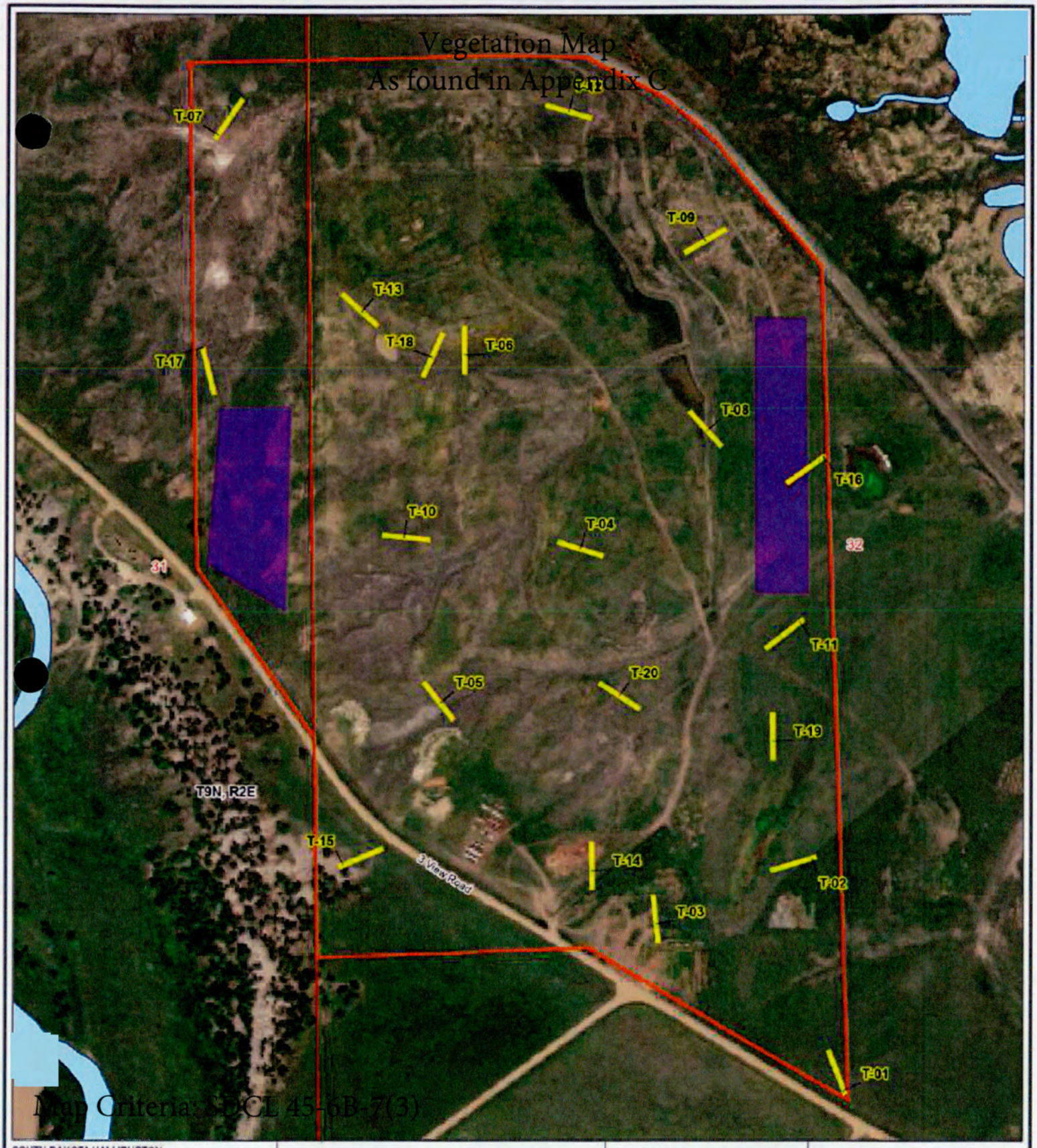
Date/Signature: 2/14/24

Map Criteria: 45-6B-7(2). 74:29:07:06(3) & 45-6B-10(6)

554 US HWY 212, Belle Fourche, SD 57717

BENTONITE
Performance Minerals LLC

Vegetation Map
As found in Appendix C



Map Criteria: SDCL 45-6B-7(3)

SOUTH DAKOTA HALLIBURTON BASELINE

Project Overview, A-1

Project Boundary
Proposed Reference Areas
Vegetative Transects
National Wetlands Inventory
Township/ Range
Section

Butte County, South Dakota
USGS 7.5' Quadrangle:
Sourdough Flats, SD, 44103-F8

NAD 1983 UTM Zone 13N
103.9104°W 44.6982°N

Base Map: ESRI ArcGIS Online, accessed July 2021

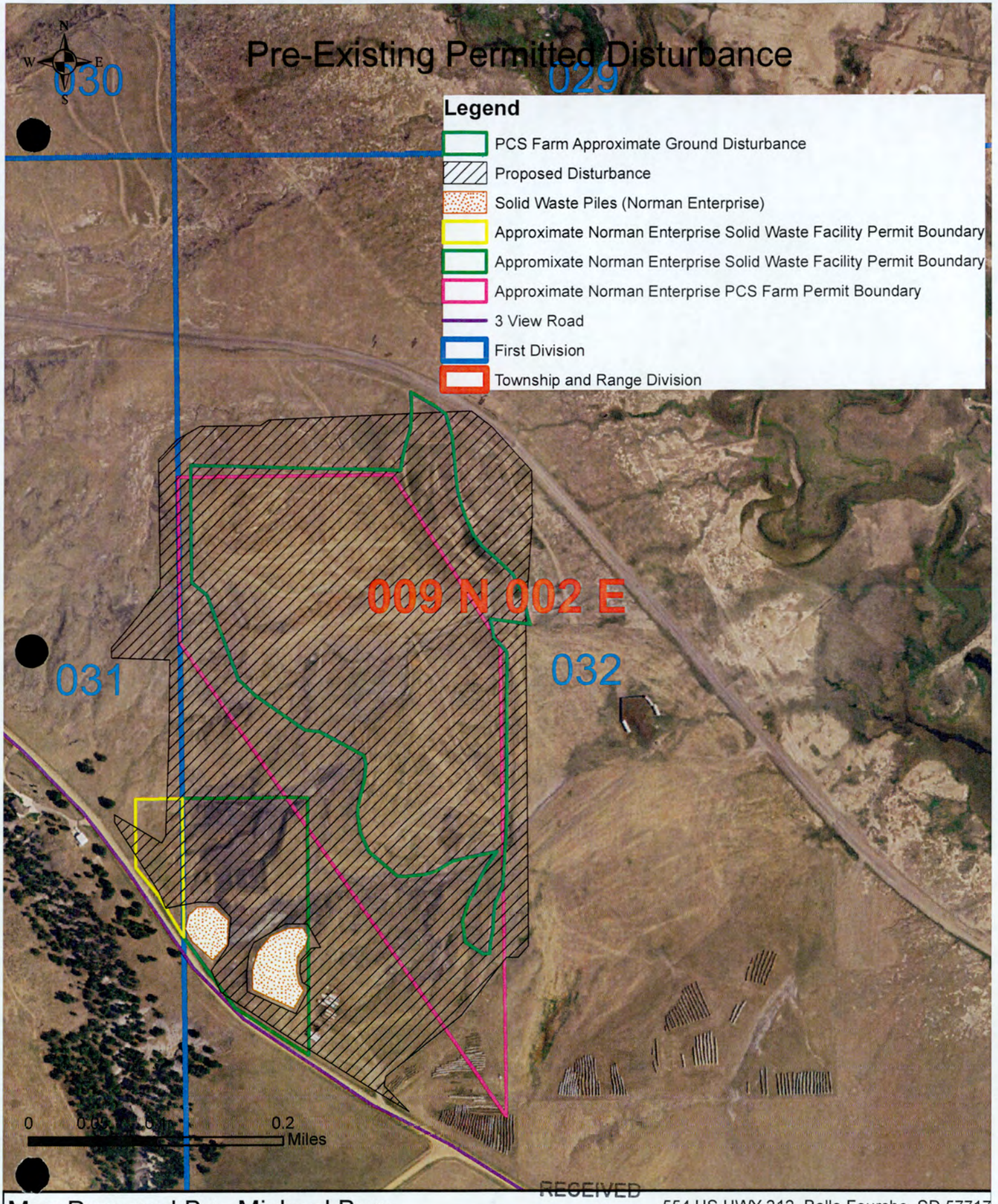
Updated: 7/19/2021
Project No. 61278
File: Fig1_1_VegetativeTransects

N
1:5,000
South Dakota

0 200 400 Feet
0 50 100 Meters

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SWCA ENVIRONMENTAL CONSULTANTS



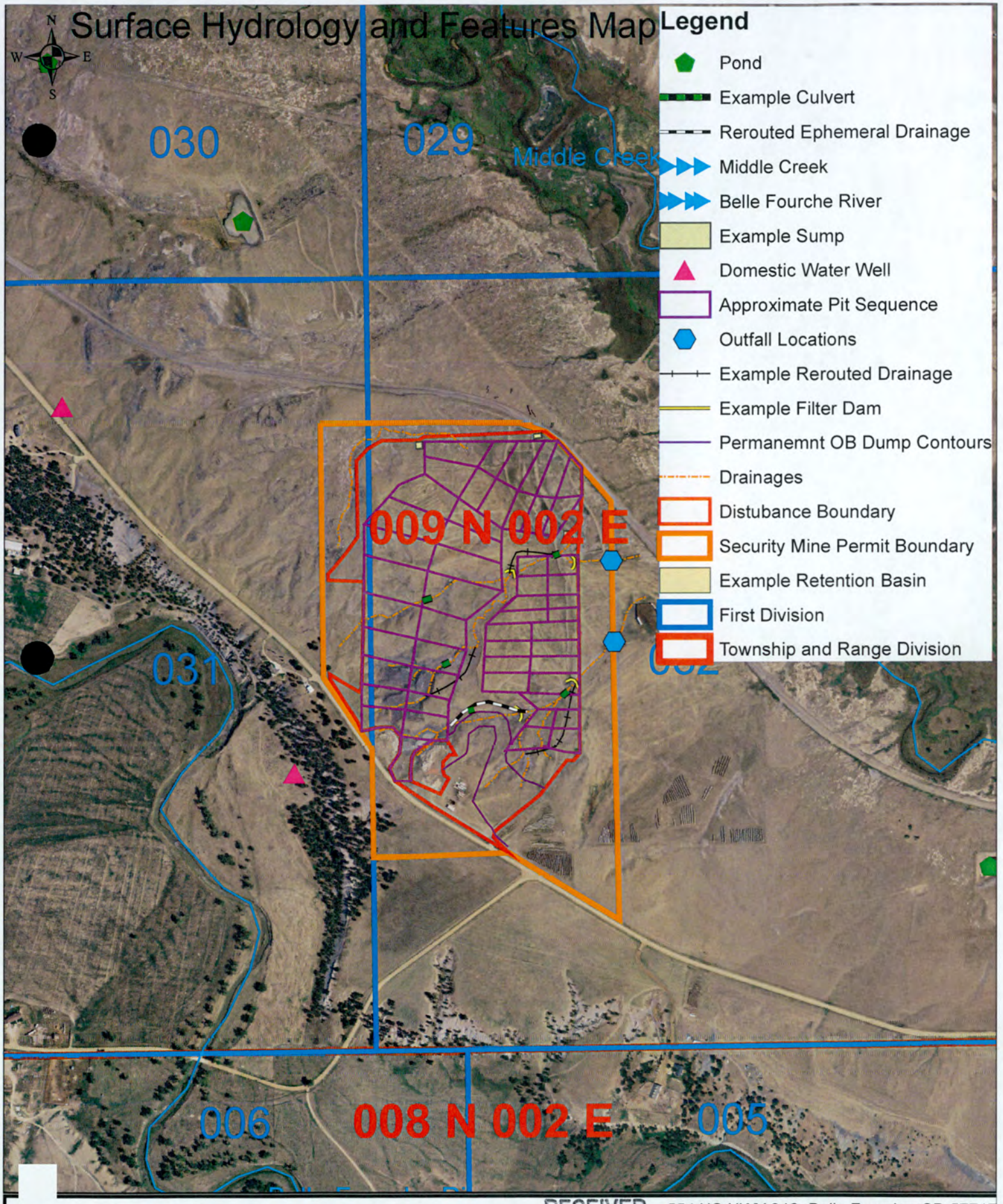
Map Prepared By: Michael Barr
Date/Signature: 2/14/24
Map Criteria: DANR Requested

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BENTONITE
Performance Minerals LLC

Surface Hydrology and Features Map



Legend

- Pond
- Example Culvert
- Rerouted Ephemeral Drainage
- Middle Creek
- Belle Fourche River
- Example Sump
- Domestic Water Well
- Approximate Pit Sequence
- Outfall Locations
- Example Rerouted Drainage
- Example Filter Dam
- Permanemnt OB Dump Contours
- Drainages
- Distubance Boundary
- Security Mine Permit Boundary
- Example Retention Basin
- First Division
- Township and Range Division

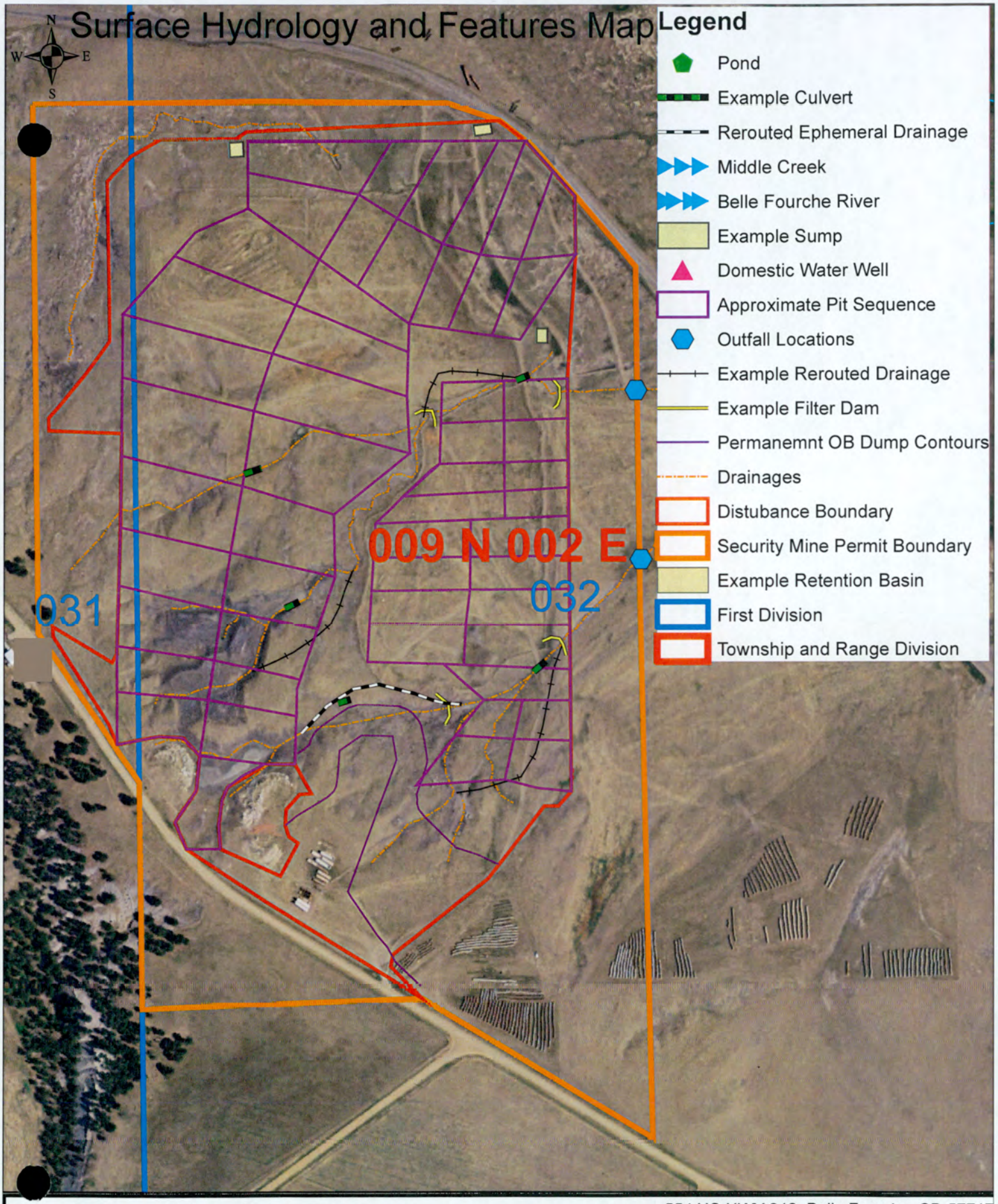
Map Prepared By: Michael Barr
Date/Signature: 2/14/24
Map Criteria: 74:29:07:08 (6), 74:29:02:11

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235A
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BENTONITE
Performance Minerals LLC

Surface Hydrology and Features Map



Legend

- Pond
- Example Culvert
- Rerouted Ephemeral Drainage
- Middle Creek
- Belle Fourche River
- Example Sump
- Domestic Water Well
- Approximate Pit Sequence
- Outfall Locations
- Example Rerouted Drainage
- Example Filter Dam
- Permanemnt OB Dump Contours
- Drainages
- Distubance Boundary
- Security Mine Permit Boundary
- Example Retention Basin
- First Division
- Township and Range Division

Map Prepared By: Michael Barr
Date/Signature: 2/14/24
Map Criteria: 74:29:07:08 (6), 74:29:02:11

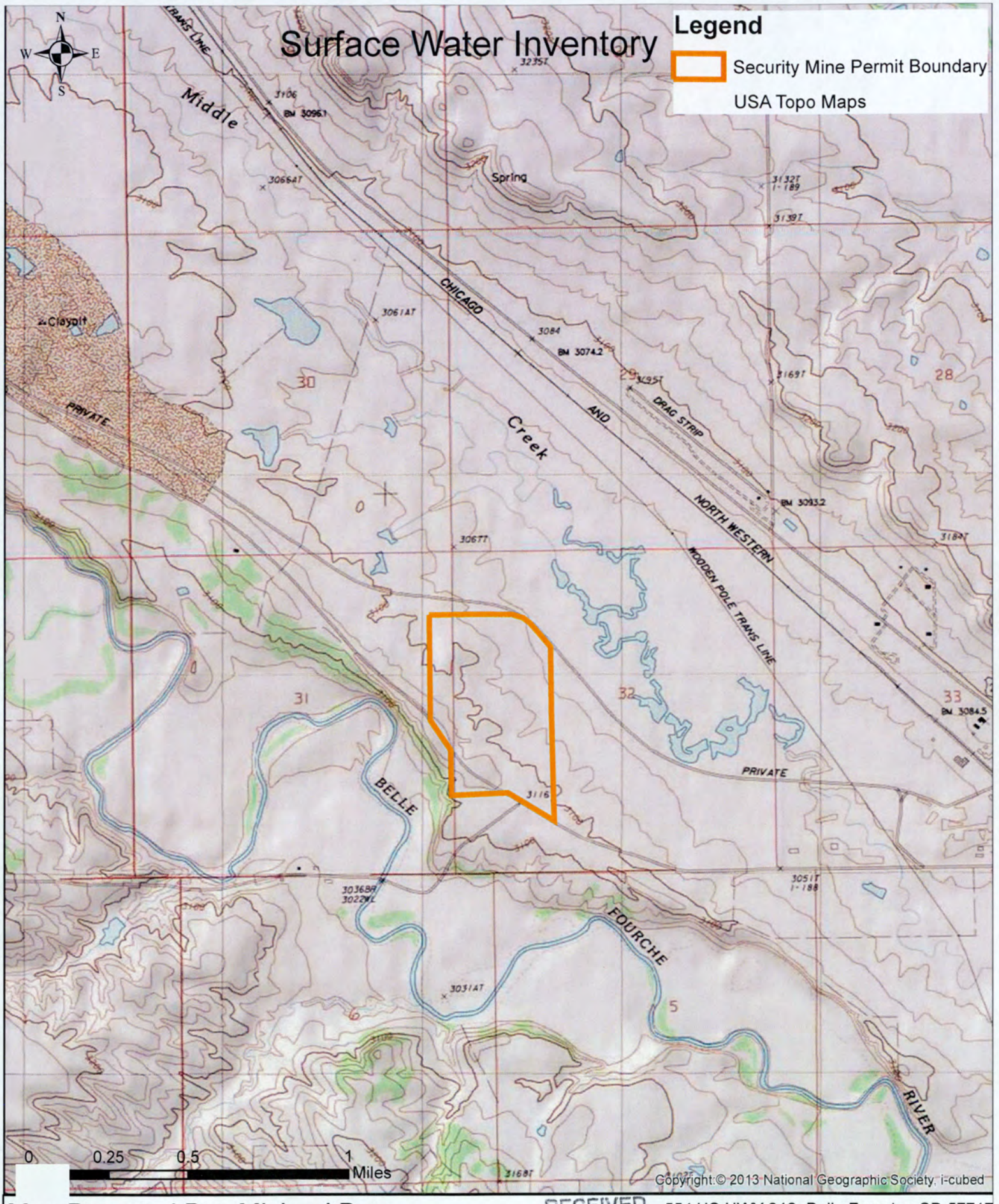
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235B

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Performance Minerals LLC

Surface Water Inventory



Copyright:© 2013 National Geographic Society, i-cubed

Map Prepared By: Michael Barr

Date/Signature: 2/14/24

Map Criteria: ARSD 74:29:02:11 (3)

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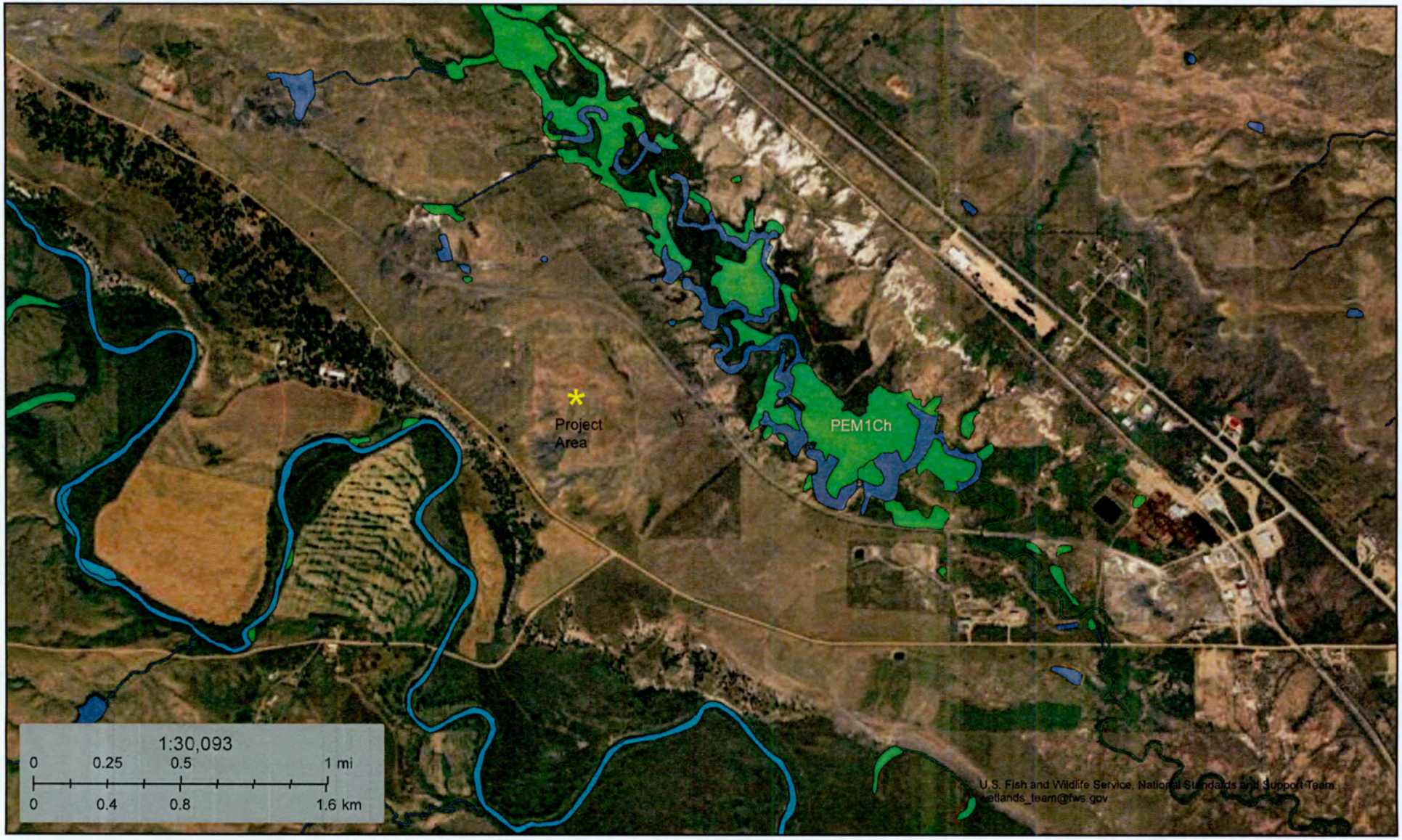
BENTONITE
Performance Minerals LLC

U.S. Fish and Wildlife Service

National Wetlands Inventory

Security

2/14/24 MMM



February 9, 2024

Wetlands

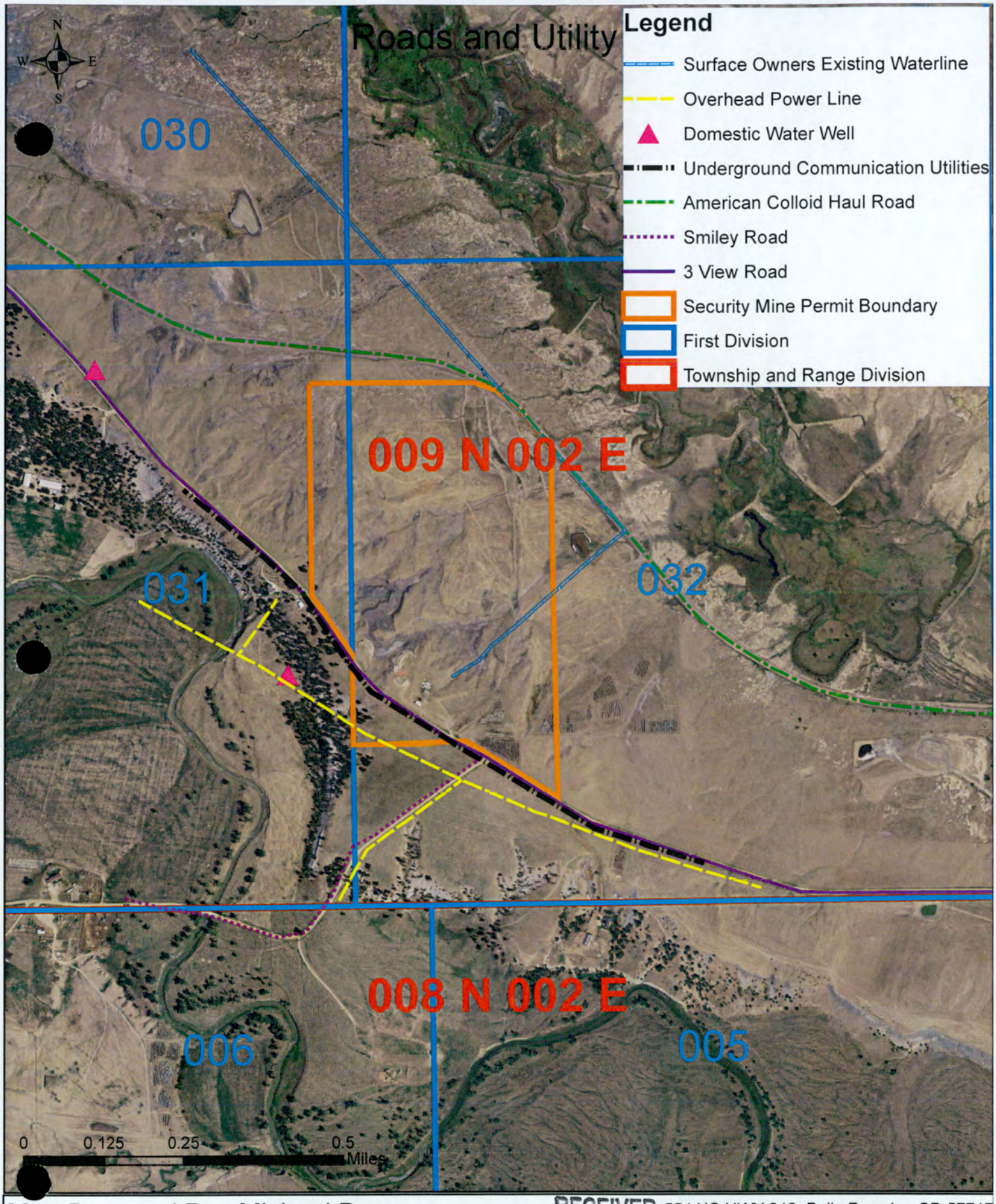
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

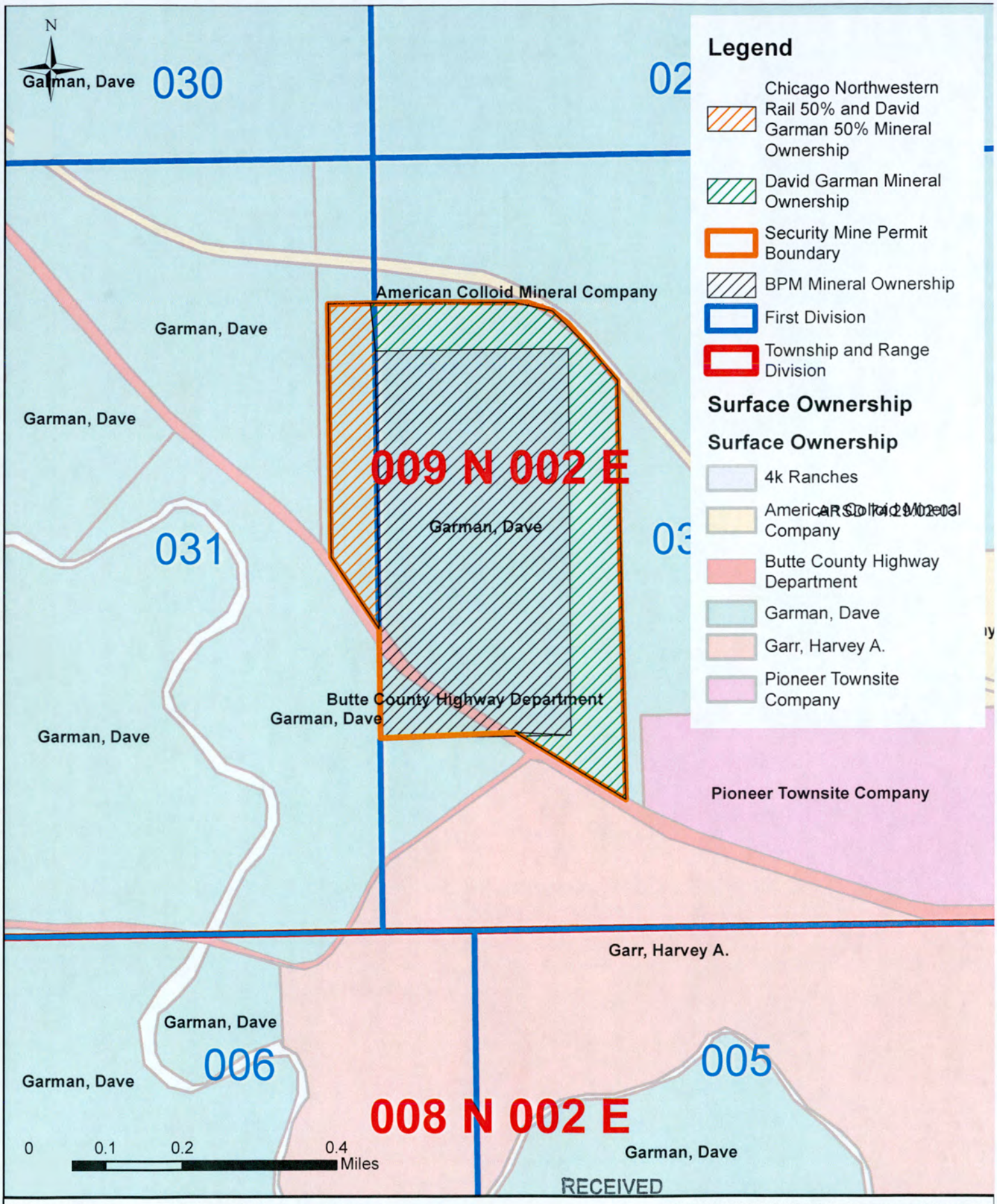


Map Prepared By: Michael Barr
Date/Signature: 2/14/24
Map Criteria: SDCL 45-6B-10 (3 & 4)

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554 US HWY 212, Belle Fourche, SD 57717

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Map Prepared By: Michael Barr

Date/Signature: 2/16/24

Map Criteria: ARSD 74:29:02:03 & SDCL 45-6B-10(2)

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554 US HWY 212, Belle Fourche, SD 57717

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Appendix B

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Appendix B

BPM Security Bentonite Mine

HALLIBURTON

554 US HWY 212 ▪ Belle Fourche, SD 57717
BPM Colony Mine ▪ MSHA Mine ID: 48-00889
Direct (307)896-2596 ▪ Fax (307)896-4588

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April 13, 2022

Katie Adair
Stormwater Program Assistant
Surface Water Quality Program
523 East Capitol Avenue
Pierre, South Dakota 57501-3181

Bentonite Performance Minerals, LLC Notice of Intent to Obtain Coverage Under the SWD General Permit for Storm Water Discharges Associated with Industrial Activities

Dear Katie,

Bentonite Performance Minerals, LLC (BPM) is submitting this Notice of Intent to apply for coverage for the Security Bentonite Mine located in Butte County South Dakota. It will hold a SD DANR mining permit number separate from permits 481 and 482 which BPM already holds.

If you have any questions about this application, please feel free to contact me at 307-896-6060 or Michael.Barr@Halliburton.com

Sincerely,

Michael Barr

Senior Resource Coordinator – Baroid HIP

554 US Hwy 212
Belle Fourche, SD 57717

Email: Michael.Barr@Halliburton.com

Office: +1.307.896.6060
Mobile: +1.775.455.5942

DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

NOTICE OF INTENT (NOI)
to Obtain Coverage Under the SWD General Permit for
Storm Water Discharges Associated with Industrial Activities

Return to: SD Department of Agriculture and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue
Pierre, South Dakota 57501-3181
Telephone: (605) 773-3351 or 1-800-SDSTORM

PLEASE PRINT OR TYPE

I. Applicant Information

Name Bentonite Performance Minerals, LLC Phone 307-896-2596

Responsible Contact Person Tyler Tetrault, Mine Manager

Street 554 U.S. Highway 212

City Belle Fourche State SD Zip Code 57717

II. Facility/Site Information:

Name Security Project Phone 307-896-2596

Responsible Contact Person Tyler Tetrault, Mine Manager

Street 554 U.S. Highway 212

City Belle Fourche State SD Zip Code 57717

III. Type of Ownership: ☑ Private ☐ State ☐ Federal ☐ Public (Other than Federal or State)

III. Type of Permit Requested: Check (X) the appropriate response:

☑ Industrial Activity ☐ Sand/Gravel Mining Activity ☐ Construction Activity

IV. Pollution Prevention Plan

A. Has the Pollution Prevention Plan been developed as required? Yes ☑ No ☐

If No, when will it be developed? _____

Please note: The plan must be developed before permit coverage begins

B. Please include a brief description of best management practices (pollution control measures) being used at the facility/site:

Collection sumps, containment structures,vegetated buffer zones or berms, road maintenance stockpile seeding, good housekeeping, diversion ditches, reclamation seeding

FOR DANR USE ONLY

Postmark Date: Permit Number: Date Permitted:

V. Facility/Site Location:

A. Quarter Portions of Section 31-32 Township 9N Range 2E

County Butte [*If available*: Latitude 44.698378 Longitude -103.910390]

B. Site/Project Name: Security Project

C. What is the **total** area covered by the site (in acres) 128.4 Acres

VI. Receiving Waters:

Please list all possible receiving waters of the storm water discharge (if discharging to a Municipal Storm Sewer, indicate which municipality and the ultimate receiving water):

Middle Creek

VII. Nature of Discharge

A. **Standard Industrial Classification (SIC) codes of this facility** (Include at least one, and up to four, SIC or 6-digit North American Industry Classification (NAIC) codes which best describe the facility. For example, the SIC Code for a sand/gravel pit is **1442**. For construction activities, no codes are assigned; therefore, indicate **CO**):

1459 - Clay, Ceramic and Refractory Minerals, Not elsewhere Classified

B. Please include a brief description of the activities conducted at this facility or construction site:

Open pit bentonite mining which includes the removal and storage of topsoil and overburden prior to the removal of the bentonite. Raw bentonite will be hauled to the process facility in Colony, WY.

VIII. Operational History (Industrial Only) **Construction Project History** (Construction or sand/gravel mining)

Date Constructed: Not yet constructed Project Start Date (MM/DD/YY): 09/01/2023

Operational Start-up: 09/01/2023 (est) Estimated Area of Total Disturbance (in acres): 84

Estimated Completion Date (MM/DD/YY): 12/31/2031

IX. Existing Environmental Permits

Please check (X) all other Environmental Permits which are held by this facility/activity. Include permit numbers in the space provided:

☐ SWD or NPDES (Discharges to Surface Water) _____

☐ UIC (Underground Injection of Fluids) _____

☐ RCRA (Hazardous Wastes) _____

☐ PSD (Air Emissions from Proposed Sources)

☑ Other (please specify) SD Mine permit

X. **Certification** (Authorized representative should ***initial*** the box)

TT **I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including revocation of the permit and the possibility of fine and imprisonment for knowing violations. In addition, I certify that I am aware of the terms and conditions of the General Storm Water permit and I agree to comply with those requirements.**

SD EForm - 2088LD V1

STATE OF SOUTH DAKOTA

BEFORE THE SECRETARY OF

THE DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

IN THE MATTER OF THE APPLICATION OF	)	
Bentonite Performance Minerals, LLC	)	**CERTIFICATION OF**
	)	**APPLICANT**
STATE OF Wyoming	)	
COUNTY OF Crook	)	

I, Tyler Tetrault, the applicant in the above matter after being duly sworn upon oath hereby certify the following information in regard to this application:

I have read and understand South Dakota Codified Law Section 1-40-27 which provides:

"The secretary may reject an application for any permit filed pursuant to Titles 34A or 45, including any application by any concentrated swine feeding operation for authorization to operate under a general permit, upon making a specific finding that:

(1) The applicant is unsuited or unqualified to perform the obligations of a permit holder based upon a finding that the applicant, any officer, director, partner, or resident general manager of the facility for which application has been made:

(a) Has intentionally misrepresented a material fact in applying for a permit;

(b) Has been convicted of a felony or other crime involving moral turpitude;

(c) Has habitually and intentionally violated environmental laws of any state or the United States which have caused significant and material environmental damage;

(d) Has had any permit revoked under the environmental laws of any state or the United States; or

(e) Has otherwise demonstrated through clear and convincing evidence of previous actions that the applicant lacks the necessary good character and competency to reliably carry out the obligations imposed by law upon the permit holder; or

(2) The application substantially duplicates an application by the same applicant denied within the past five years which denial has not been reversed by a court of competent jurisdiction. Nothing in this subdivision may be construed to prohibit an applicant from submitting a new application for a permit previously denied, if the new application represents a good faith attempt by the applicant to correct the deficiencies that served as the basis for the denial in the original application.

All applications filed pursuant to Titles 34A and 45 shall include a certification, sworn to under oath and signed by the applicant, that he is not disqualified by reason of this section from obtaining a permit. In the absence of evidence to the contrary, that certification shall constitute a prima facie showing of the suitability and qualification of the applicant. If at any point in the application review, recommendation or hearing process, the secretary finds the applicant has intentionally made any material misrepresentation of fact in regard to this certification,

consideration of the application may be suspended and the application may be rejected as provided for under this section.

Applications rejected pursuant to this section constitute final agency action upon that application and may be appealed to circuit court as provided for under chapter 1-26."

I certify pursuant to 1-40-27, that as an applicant, officer, director, partner, or resident general manager of the activity or facility for which the application has been made that I; a) have not intentionally misrepresented a material fact in applying for a permit; b) have not been convicted of a felony or other crime of moral turpitude; c) have not habitually and intentionally violated environmental laws of any state or the United States which have caused significant and material environmental damage; (d) have not had any permit revoked under the environmental laws of any state or the United States; or e) have not otherwise demonstrated through clear and convincing evidence of previous actions that I lack the necessary good character and competency to reliably carry out the obligations imposed by law upon me. I also certify that this application does not substantially duplicate an application by the same applicant denied within the past five years which denial has not been reversed by a court of competent jurisdiction. Further;

"I declare and affirm under the penalties of perjury that this claim (petition, application, information) has been examined by me, and to the best of my knowledge and belief, is in all things true and correct."

Dated this 23rd day of March, 2022.

Tyler Tetrault
Applicant (print)

Applicant (signature)

Subscribed and sworn before me this 23rd day of March, 2022.

Cheryl L. Wolff
Notary Public (signature)

My commission expires: 10-23-2024

NOTARY PUBLIC
CHERYL L. WOLFF
STATE OF WYOMING
COUNTY OF CAMPBELL
My Commission Expires 10-23-2024

PLEASE ATTACH ANY ADDITIONAL INFORMATION NECESSARY TO DISCLOSE ALL FACTS AND DOCUMENTS PERTAINING TO SDCL 1-40-27 (1) (a) THROUGH (e). ALL VIOLATIONS MUST BE DISCLOSED, BUT WILL NOT AUTOMATICALLY RESULT IN THE REJECTION OF AN APPLICATION

Bentonite Performance Minerals, LLC

South Dakota Mining Operations

Storm water Pollution Prevention Plan (SWPPP)

General Permit for Storm Water Discharges for Industrial Activities

December 19, 2023

Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature **Date**

by: Tyler Tetrault, Mine Manager

TABLE OF CONTENTS

1.0 PLANT LOCATION - PLANT DESCRIPTION

2.0 ADMINISTRATIVE REQUIREMENTS

- 2.1 Plan Location
- 2.2 Signatory Requirements
- 2.3 Certification Statement
- 2.4 Submittals/Amendments
- 2.5 Implementation
- 2.6 SWPP Plan Administrator
- 2.7 Pollution Prevention Team

3.0 EXPOSED MATERIAL INVENTORY

- 3.1 Exposed Material Inventory
  - Section 3.1.1 – **Overburden Piles**
  - Section 3.1.2 - Open **Pits**
  - Section 3.1.3 - **Topsoil and Subsoil Piles**
  - Section 3.1.4 - **Staging Areas**
  - Section 3.1.5 - **Petroleum Storage Area**
  - Section 3.1.6 - **Roads**
  - Section 3.1.7 - **Bentonite Stockpile Areas**
  - Section 3.1.8 - **Truck Loading Areas**

4.0 SPILL HISTORY

5.0 SAMPLING DATA

6.0 MEASURES AND CONTROLS

- 2.1 Housekeeping Procedures
- 2.2 Preventative Maintenance

2.3 Spill Prevention and Response Procedures
2.4 Sediment and Erosion Control
2.5 Storm water and Erosion Control
2.6 Management of Runoff

7.0 COMPREHENSIVE SITE COMPLIANCE EVALUATION

8.0 NON-STORM WATER DISCHARGES

9.0 SAMPLING REQUIREMENTS

9.1 Inspections and Record Keeping
9.2 Reporting

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10.0 INSPECTIONS RECORD KEEPING AND REPORTING

11.0 EMPLOYEE TRAINING

12.0 DISCHARGES TO WATER QUALITY IMPAIRED WATERS

LIST OF APPENDICES

APPENDIX A	**Figure 1 – Facility Overview Map** **Figure 2 – Killinger Site Map** **Figure 3 – Purple Site Map** **Figure 4 – Security Site Map**
APPENDIX B	**Storm Water Inspection Form**
APPENDIX C	**Spill Prevention, Control, & Countermeasure Plan (SPCC)**
APPENDIX D	**General Permit for Storm Water Discharges Associated with Industrial Activities**
APPENDIX E	**Completed Storm Water Inspection Forms**
APPENDIX F	**Monitoring Summary**

1.0 MINING OPERATIONS LOCATION and DESCRIPTION

The Bentonite Performance Minerals, LLC operations are located in Butte County, South Dakota as shown on Figure 1, Appendix A.

- Killinger - Sections 31 and 32, Township 9N, Range 2E (Figure 2, Appendix A)
- Purple - Section 32, Township 9N, Range 2E, (Figure 3, Appendix A)
- Security – Sections 31 and 32, Township 9N, Range 2E (Figure 4, Appendix A)

The site is served by the Belle Fourche, SD Fire Department.

The site mailing address is:

Bentonite Performance Minerals, LLC
Box 554, US Hwy. 212
Belle Fourche SD 57717:
Phone # - (307)-896-2596

Name and Address of Owner/ Operator:

Halliburton Energy Services, Inc
3000 N Sam Houston Pkwy E
Houston, TX 77032

The mining method consists of cut and fill.

2.0 ADMINISTRATIVE REQUIREMENTS

2.1 Plan Locations

In accordance with the SD general permit for storm water discharges associated with industrial activities (General Permit), an updated copy of this Storm Water Pollution Prevention Plan (SWPPP) will be maintained in the Environmental Department Filing System at the Colony Plant Site in Colony Wyoming. Additionally, a copy of the SWPPP will be made available at the Bentonite Performance Minerals, LLC (BPM) and if applicable the Contractor's field sites.

2.2 Signatory Requirements

As a corporation and in accordance with the General Permit, all applications, reports, or information submitted to the South Dakota Department of Agriculture and Natural Resources (SD DANR) by BPM on behalf of this Permit shall be signed and certified by a responsible corporate officer as defined under §6.8 of the General Permit. By regulation, a responsible corporate officer is defined as an individual that has direct oversight in the development and that all information is true and correct.

2.3 Certification Statement

All applications, reports, or information submitted to the SD DANR by BPM on behalf of this Permit shall contain the following certification:

> "*I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.*"

2.4 Submittals/Amendments

This SWPPP shall be amended whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to surface waters, or if this SWPPP proves to be ineffective in achieving the general objectives of managing storm water.

2.5 Implementation

This SWPPP takes immediate effect upon finalization. Implementation of this SWPPP shall be the primary responsibility of the Mine Manager and the Environmental Specialist in cooperation with on-site operating personnel.

2.6 SWPPP Plan Administrator

The Environmental Specialist shall have the responsibility of plan administration and implementation.

2.7 Pollution Prevention Team

BPM has appointed a Storm Water Pollution Prevention Team. This team is responsible for developing and implementing this SWPPP, and for supervising the construction and maintenance of all storm water control structures. This committee is comprised of the following staff positions and associated personnel:

Environmental Specialist	**Jennifer Hartman - Team Lead**
Minerals Resource Coordinator	**Michael Barr – Cooperating Team Lead**
Mine Manager	**Tyler Tetrault – Implementation/Costing**
Field Supervisor	**Jay Pfarr - Implementation**
Mine Supervisor	**Rick Bevier - Implementation**
Mine Engineer	**Nathan Swanson- Implementation**

Day-to-day implementation of storm water management is accomplished by the mine crew, as directed by the mine Supervisor and mine Engineer. Storm water inspections, assessments, planning, and coordination of committee meetings, projects, etc. are managed through the Environmental Specialist. The Storm Water Pollution Prevention Committee will meet, as needed, to address storm water concerns, issues, BMPs, or related matters.

The following table is a list of emergency response team members and represents a concise list of operations personnel who are familiar with sites storm water management.

BPM Minerals, LLC – Colony Facility Spill / Emergency Response Team Phone Numbers	
Jennifer Hartman – Environmental Specialist (Office Number)	**307-896-8507**
Mr. Jay Pfarr – Field Supervisor (Office Number)	**307-896-8525**
Mr. Tyler Tetrault – Mine Manager (Office Number)	**307-896-8532**
Mr. Rick Bevier – Mine Supervisor (Cell Phone Number)	**605-892-5283**
Mr. Mike DeHaven – Mine Supervisor (Cell Phone Number)	**605-569-6191**
Nathan Swanson – Mine Engineer (Office Number)	**307-896-9143**
Mr. Michael Barr – Minerals Resource Coordinator (Cell Phone Number)	**775-455-5942**

3.0 EXPOSED MATERIAL INVENTORY

3.1 EXPOSED MATERIAL DESCRIPTION

Potential significant storm water pollutant source areas at the South Dakota Mine operations consist of:

- **Overburden Piles** (Section 3.1.1)
- **Open Pits** (Section 3.1.2)
- **Topsoil Piles and Subsoil Piles** (Section 3.1.3)
- **Staging Areas** (Section 3.1.4)
- **Petroleum Storage Areas**(Section 3.1.5)
- **Roads** (Section 3.1.6)
- **Bentonite Stockpile Areas** (Section 3.1.7)
- **Truck Loading Areas** (Section 3.1.8)

Each of these source areas is identified in Appendix A, Figures 2 through 4. South Dakota Mining operations discharge storm water to various channels and draws which drain to Middle Creek and the Belle Fourche River. Both Killinger and Purple are in final reclamation. Soil disturbance is only planned northeast of 3 View Road for the Security Project (Figure 4) and storm water flows northeast to Middle Creek. In most cases, storm water is collected in cups (shallow moat) around pits or in stock ponds or sumps that act as sediment traps and settling ponds. Potential pollutant sources and materials are discussed in further detail below.

3.1.1 Overburden Piles

3.1.1.1 Method and Location for Storage, Handling and Processing

Overburden is generated when mining for clay. In general, overburden is backfilled into previous pits, graded, topsoiled and seeded to minimize disturbance. There are occasions where overburden is placed on undisturbed areas. In this case, the topsoil and subsoil is removed before placing the overburden. The overburden is then placed, graded to 5:1 or less, topsoiled and seeded. A berm, trench or "cup" typically rings or surrounds the overburden pile to prevent storm water runoff/run-on.

3.1.1.2 Pollution Potential

The pollution potential from the overburden is suspended solids (TSS). The overburden has been characterized extensively over the years and found not to contain harmful metals or other leachable substances that can damage the environment. This is further evidenced by the historical record and observation of the runoffs lack of impact on the surrounding vegetation, water quality and animal populations.

3.1.1.3 Management Practices and Controls

The TSS in storm water is managed by placing overburden directly into backfill or designing cups and sumps around the overburden pile. Cups and sumps collect runoff from the piles and typically do not discharge. Further, any errant runoff from the overburden piles is collected in drainages that have additional Best Management Practices (BMPs) such as meander bars, stock/sediment ponds and less often filtration dams (see BMP Section for a description of these controls).

3.1.2 Open Pits

3.1.2.1 Method and Location for Storage, Handling and Processing

Bentonite mining creates pits to access the bentonite layers. These pits typically collect storm water. The open pit life is short (1-5 years) and often backfilled the same year, as cast-back mining progresses. The backfilled pit is graded, topsoiled and seeded.

3.1.2.2 Pollution Potential

Pits tend to collect storm water, therefore there are times that BPM must dewater storm water collected in pits in order to mine the bentonite. A strict procedure has been established for removing water from these pits in accordance with state guidelines.

3.1.2.3 Management Practices and Controls

First, a 6 to 10 foot buffer zone is created around pits. The buffer is bermed on the outside to prevent un-impacted storm water run-on into the pits.

Second, before pumping water from a pit, the clay in the water must first be given an opportunity to settle. Water may only be pumped from a pit into an area that does not connect with a major drainage. If water is pumped to a major drainage, the drainage must contain BMPs such as meander bars or a stock or sediment pond(s) which does not allow the pumped storm water to flow directly to Middle Creek or other potential waters of the state. A vegetation buffer zone exists between BPM's mining and either Middle Creek or Belle Fourche River.

3.1.3 Topsoil and Subsoil Piles

3.1.3.1 Method and Location for Storage, Handling and Processing

Topsoil and subsoil piles are created to reclaim disturbed land (i.e. pits, overburden, and other disturbed areas). The piles are temporary. The locations

of the topsoil and subsoil piles are reported annually to the SD DANR Minerals and Mining Program.

3.1.3.2 Pollution Potential

The pollution potential from the topsoil piles is TSS entrained in storm water runoff.

3.1.3.3 Management Practices and Controls

Topsoil is usually spread immediately after it is collected in accordance with BPM's policy of concurrent mining and reclamation. However, there are times when topsoil and subsoil piles must be created to reclaim pits, roads and other miscellaneous disturbances at a later date. The topsoil and subsoil piles that remain in place for longer than 6 months are sloped at 3:1 or less and seeded to minimize erosion and pile diminution. A cup is often placed around piles as a BMP to help collect storm water runoff and prevent a discharge away from the disturbance

3.1.4 Staging Area (Camp Sites)

3.1.4.1 Method and Location for Storage, Handling and Processing

In preparation of mining an area, BPM and its contractors must set up an equipment staging area or camp. The camps are usually about one to two acres in size and contain a parking area for equipment, support vehicles, fuel storage, a fueling area, a parts trailer, and a mobile lunch room/meeting place. The camps sites are selected based on grade, and convenience to the mining area. Disturbance areas and campsites are reported annually to SD DANR Minerals and Mining Program.

3.1.4.2 Pollution Potential

The pollution potential for the camp site(s) is runoff containing TSS, hydrocarbons, and miscellaneous trash. Hydrocarbons are discussed in Section 3.1.5 and is managed by the SPCC plan (Appendix C).

3.1.4.3 Management Practices and Controls

Each campsite is encircled by a 1 to 2 foot berm and constructed on a 1 to 2% grade. On the down-gradient end of the camp a sump is constructed to catch storm water runoff and prevent a spill of petroleum product to a localized drainage. All trash and debris generated at the camp is collected and regularly transported to the plant site or landfill for disposal.

3.1.5 Petroleum Storage and Fueling Area

3.1.5.1 Method and Location for Storage, Handling and Processing

Camp-sites may contain oils/greases and other petroleum products (hydraulic oils) that help maintain the mining equipment. Bulk fueling, lubrication and maintenance of equipment may also take place inside the camp-sites. The locations of the camp-sites are reported annually to the SD DANR under permit.

3.1.5.2 Pollution Potential

The pollution potential is the result of spills and leaks outside the designed containment drums, tanks, hoses and equipment of petroleum products.

3.1.5.3 Management Practices and Controls

The management of field storage, dispensing, and clean up of hydrocarbons is discussed in the BPM SPCC Plan (Appendix C). In summary, this plan directs all storage of petroleum products to be maintained within the bermed and graded camp area. The camp area has a sump that is capable of storing 110% of the largest storage container in the camp area. The regular fueling of equipment is also to be performed in the camp area. Hoses and dispensing valves/nozzles are to be accomplished above 50-gallon drip pans.

The camp area is typically situated on bentonitic clays and soils or shale-clay soils. Both surfaces are extremely impermeable and readily soak up petroleum products and other liquids (Floor-Dri is a bentonite product). This unique characteristic of bentonite makes it an ideal surface for containment of spills. In the event of a spill of petroleum product, the soil is excavated and placed into pile and removed to the permitted BPM landfarm in Colony, WY. The spill is reported internally (if less than 25-gallons and not impacting local surface water) as a spill inside containment per the SPCC plan.

BPM maintains 95-gallon spill kits and overpack drums at each camp site.

3.1.6 Roads

3.1.6.1 Method and Location for Storage, Handling and Processing

BPM constructs roads to access mining areas and to haul bentonite to its Colony Plant site. There are several types of roads which include haul roads, access roads and two-track roads. Many of the roads BPM constructs are temporary. Main haul roads are constructed to very exact standards to hold up in the rain and heavy traffic. The locations of the roads are reported annually to the SD-DANR annually. All roads are reclaimed unless otherwise requested by a landowner or the state.

3.1.6.2 Pollution Potential

The pollution potential from the roads is TSS, potential leaks and spills of petroleum products (from trucks and equipment), and air-borne dust.

3.1.6.3 Management Practices and Controls

The management of the roads includes, dust control (watering), blading and ditching, crowning, use of proper road construction materials (shale) and routine maintenance. The dust control measures include watering the roads using several water trucks on a regular basis during each day. The roads are also bladed with a maintainer to remove fines and help establish a crown. The road ditches are cut to help promote water runoff and settling. Appropriately sized culverts are installed to divert water under roads and keep open drainages.

3.1.7 Bentonite Stockpile Areas

3.1.7.1 Method and Location for Storage, Handling and Processing

Typically stockpiled bentonite is left in pits awaiting removal by loader and trucks. However, occasionally bentonite is removed from pits and stockpiled on previously disturbed ground.

3.1.7.2 Pollution Potential

The stockpiled bentonite may create TSS in storm water runoff.

3.1.7.3 Management Practices and Controls

The stockpiles of bentonite in pits and outside of pits are cupped (ditched) and bermed to prevent loss of bentonite and to prevent storm water runoff/run-on.

3.1.8 Truck Loading Areas

3.1.8.1 Method and Location for Storage, Handling and Processing

Trucks are loaded with bentonite in the field. The bentonite is typically loaded in pits floors. On occasion bentonite is loaded outside of pits. The trucks transport the bentonite to the Colony Plant.

3.1.8.2 Pollution Potential

Truck loading has the potential to increase TSS loading to localized drainages as well as trucks breaking a hydraulic line or spilling diesel fuel.

Bentonite is typically loaded into trucks within the depression of a pit; therefore, sediments are contained. Storm water pumping from pits is discussed in section 3.1.2. However, clay loaded on trucks outside of a pit may result in additional TSS loading. The spillage of hydrocarbons from trucks is addressed in the SPCC plan and below.

3.1.8.3 Management Practices and Controls

The loading of bentonite outside of pits occurs in areas that are flat and are bermed to prevent runoff. The bentonite piles are cupped to prevent storm water runoff from the bentonite piles and storm water run-on from undisturbed areas.

Trucks are required to carry spill control equipment and immediately report spills of hydrocarbons. Petroleum contaminated soils are to collected and transported to the permitted BPM landfarm in Colony, WY.

4.0 SPILL HISTORY

There are no known reportable spills in the field area.

5.0 MONITORING SAMPLING DATA

Storm water runoff from South Dakota mining operations enters various channels and swales where various BMPs help to minimize sediment loading before discharging into Middle Creek and/or other potential waters of the state. The outfalls and storm water sampling sites are identified on Figures 2 through 4. These outfalls are potential storm water exit points from BPM's permit boundary. Visual monitoring and/or sampling is required per §3.9.3 of the General Permit. Monitoring must be performed in accordance with §5.1 of the General Permit at least once per calendar year. Monitoring must be conducted within 24 hours of a storm event greater than 2 inches or snowmelt large enough to cause runoff. If an oil sheen is visible, a grab sample for oil and grease shall be taken immediately, analyzed and reported. A summary of the sampling data collected must be kept as Appendix F to the SWPPP. Below is the sampling table from the General Permit §3.9.3:

Effluent Characteristic	Reporting Values	Sample Type
Oil and Grease	Presence or Absence of Sheen	Visual[1]
Oil and Grease, mg/L[2]	Daily Maximum	Grab[1]
Visible Pollutants	Presence or Absence of Visible Pollutants, Discoloration, Etc.	Visual

[1] The presence or absence of an oil sheen shall be visually monitored. In the event that an oil sheen or floating oil is observed during discharge, a grab sample for Oil and Grease shall be taken immediately, analyzed, and reported.

[2] Use Standard Methods 1664A – hexane extraction.

6.0 Best Management Practices

6.1 Housekeeping Procedures

Proper housekeeping is an integral component of BPM's operating, environmental, and safety programs. Both environmental and safety inspections are conducted routinely in the South Dakota mining areas, evaluating, among other things, the proper storage of chemicals; water management; erosion control; air quality; waste management; and related environmental matters.

Failure to adhere to BPM's housekeeping policies, the SPCC Plan, and/or this SWPPP will result in an inspection finding and trigger the implementation of corrective measures.

6.2 Preventative Maintenance

BPM conducts routine (at a minimum of twice/year) inspections of storm water control structures and evaluates compliance with SWPPP requirements. Further, preventative maintenance is performed on sources of air pollution and operating equipment that could contribute pollution (primarily dust) to the South Dakota operations.

Identified corrective action items from the storm water inspections are communicated to the Mine Manager upon completion of each inspection. The Environmental Manager is responsible for implementation of remedial measures within a reasonable time period, usually before 14 days. In general, the mine crews are responsible for completing the necessary repairs.

6.3 Spill Response and Countermeasures

Please refer to the attached Spill Prevention, Control, and Countermeasure Plan (SPCC Plan) in Appendix C.

6.4 Sediment and Erosion Control

The South Dakota Mining operations utilize a wide range of BMPs and measures relating to storm water control. These BMPs are intended to minimize the loss of soil resources and maintain water quality. To date, these BMPs have proven effective in minimizing soil loss and eliminating the potential for storm water runoff. The following structures and practices are currently utilized to control storm water runoff:

Comprehensive Site Drainage Plan
Road BMPs

Cupping and Berming
Buffer Zones with Sediment Traps
Channels (to control and route drainage)
Sediment Containment Basins
Native Vegetative Buffer Zones
Petroleum Containment
Filter Dams
Meander Bars
Seeding Practices

6.5 Storm Water Exposure Control

BPM has implemented many operational practices that are intended to minimize erosion and prevent the transport of sediments to surface water. Where practical, storm water is routed around operations and areas of concern to limit exposure. Please refer to Sections 3.0 and 6.6

6.6 Management of Runoff

Selecting environmentally and economically sound BMPs for storm water management is a critical component of BPMs Storm Water Management Program. The physical and chemical characteristics of the potential source areas, as well as the type of conveyance are all considered when selecting appropriate BMPs. At the South Dakota Mining operations, the following BMPs are currently in place or proposed as part of this plan.

Road BMPs – A number of road BMPs are currently and will be utilized within the permit area to drain water away from the general facility areas toward central sediment control and collection areas. BMPs may include diversion channels, buried culverts, road grade sloping, earthen berms, road swales, and coarse road base material.

Buffer Zones with Sediment Traps – Overburden stockpiles, topsoil piles, and subsoil piles are often constructed with an area around the toe that has been grubbed, graded and cupped to allow runoff from the piles to collect and not discharge. This keeps storm water runoff from leaving the disturbance area.

Sediment traps are often constructed outside of pits. Water is pumped into these traps from pits. Fines settle out sediment in the traps before the collected water flows to swales, vegetative buffer zones, and ephemeral drainages. Storm water may evaporate from the sediment traps which results in the fines remaining within the sediment trap.

Berms and Channels – Just as runoff is prevented from leaving disturbed areas, run-on is also managed by constructing berms, and diversion ditches that route non-impacted storm water around pits, overburden piles, topsoil piles and camps.

Sediment Retention Basins – Sediment traps are constructed at variable and strategic locations as needed within the permit boundary – primarily downstream of mining activities. The basins are man-made and vary in size to promote settling of TSS prior to storm water leaving the permit boundary. Storm water may evaporate from the sediment traps which results in the fines remaining within the sediment trap.

Vegetation Buffer Zones – Where possible storm water is encouraged to migrate to vegetation areas where sediment can settle or be filtered. This is typically where discharge from dewatering pits is directed. For the Security site, a vegetative buffer zone (approximately 0.12 miles) extends from BPM's permit boundary northeast to Middle Creek. Furthermore, ACC Haul Road serves as a dividing line between Security's disturbance area and Middle Creek. BPM tries to reclaim disturbed areas in proportion to newly disturbed areas thus practicing concurrent reclamation and mining. This practice minimizes disturbance exposed to storm water.

Petroleum Containment – All storage and fueling of mining equipment is performed within the camp area. This area is bermed, graded and contains a collection sump to ensure that a spill or leak does not leave the camp area. The sump is sized to be at least 110% or the largest bulk storage container. The camp areas are typically situated on clay or clay-shale soils, which are relatively impermeable. Again storm water run-on to the camp area is prevented by berms and ditches.

Filter Dams – Filter dams have been tested in the mine area with limited success and application. These dams consist of a rock buttress, pea gravel and sand layered in a channel. The sand is held in place by the pea gravel and 6-8-inch rock buttress. The sand initiates the filtering of sediment in channels. As a layer of fines develop on the sand layer the dam becomes more effective in its filtering capacity.

Filter dams cannot handle high velocity flows and heavy solids loading as they may become plugged. They require maintenance (raking) and overflow diversion to prevent washouts.

Meander Bars - Channels downstream of mining may contain meander bars. These bars are installed in man-made sinuous channels and extend into the channel to trap sediment. The meander bars are installed in channels that do not have a high gradient.

Seeding Practices – Typical reclamation practices on the South Dakota mining operations require seeding on all disturbed areas including overburden piles, topsoil piles, subsoil piles, reclaimed pits and camps. Seeding typically takes place in the fall and employs a NRCS and DANR approved seed mix.

7.0 SEMI-ANNUAL INSPECTIONS AND COMPREHENSIVE SITE EVALUATION

Annual Comprehensive Site Evaluation:

At least annually, BPM shall conduct a comprehensive site compliance evaluation. This site evaluation will encompass the aspects in the General Permit §3.8 in addition to any monitoring which the department may require. The site compliance evaluation must include:

1. Industrial materials, residue or trash that may have or could come into contact with storm water
2. Leaks or spills from industrial equipment, drums, tanks, and other containers
3. Offsite tracking of industrial or waste materials
4. Tracking or blowing raw, final or waste materials from areas of no exposure to exposed areas
5. Structural control measures needing replacement, maintenance, or repair
6. Areas of potential non-compliance with the General Permit
7. Any areas with potential pollutant sources identified in SWPPP §3.0
8. Visual inspection of equipment needed to implement the SWPPP
9. Updates required for the site SWPPP Maps
10. Visually inspect Spill Response equipment/kits

Within two weeks of the inspection, the description of any new potential pollutant sources identified will be addressed based on the results of the inspection. Within 12 weeks after the inspection, changes to the plan will be implemented.

Based on the results of the inspection, the SWPPP will be revised within 14-days of such inspection and must provide for implementation of the changes in a timely manner. Further, an annual report summarizing the scope of the inspection, personnel making the inspection, inspection dates, major observations, and actions taken in accordance with the site inspection must be developed and retained in the SWPPP.

Semi-Annual Comprehensive Site Evaluation:

Site inspections must be conducted semi-annually by an appropriately trained person familiar with the General Permit conditions and the SWPPP. The inspection must determine if structural and non-structural control measures require maintenance or changes and evaluate the completeness and accuracy of the SWPPP. At least one semi-annual inspection must be conducted within 24 hours of a storm event greater than 2 inches or snowmelt large enough to cause runoff. A visual evaluation of storm water discharge must be documented which detects presence/absence of an oil sheen and any visible pollutants (color, clarity, suspended solids etc.). If an oil sheen is detected a grab sample for oil and grease must be taken immediately.

8.0 NON-STORM WATER DISCHARGES

Sources of storm water discharges at the South Dakota Mining operation have been evaluated for the presence of non-storm water discharges or "related effluents". Since the South Dakota operations do not use any makeup or process water in the mining process non-storm water discharges do not occur.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Tyler Tetrault, Mine Manager

9.0 MONITORING REQUIREMENTS

Storm water sampling for oil and grease is required if visible monitoring of stormwater required in §3.9 detects a sheen.

10.0 RECORD KEEPING, AND REPORTING

10.1 Record Keeping and Reporting

(§5.2 and §5.3)

BPM will retain records of the SWPPP, General Permit, authorization letter, inspection records, monitoring and sampling data, and all reports required by the General Permit for a period of at least 3 years after the record is generated.

Records of monitoring information must include:

a. Date, exact place, and time of sampling.
b. Name of individual performing the sampling.
c. Dates and times of laboratory analyses.
d. Initials or name of person doing the analyses.
e. Reference to analytical techniques or testing methodology used
f. Analytical testing results
g. Date and duration of the storm event sampled.
h. An estimate of rainfall associated with the runoff.
i. Number of days since the last measurable rainfall.
j. Estimated total volume of discharged or discharge rate at that outfall during the monitoring event.

10.2 Reporting Requirements

Any discharge monitoring results obtained during the permit period must be reported to SD DANR within one month of the end of the year the samples were taken (January 31st). All monitoring reports must be signed in accordance with § 5.3.

10.3 Spill Prevention and Response Procedures

The only hazardous materials that pose a spill threat in the South Dakota Mining Operations are petroleum products such as diesel, oil, and grease. A response to a spill of these materials is covered extensively in the BPM SPCC Plan found in Appendix C of this document.

11.0 EMPLOYEE TRAINING

In accordance with §4.5.5 training will include all supervisors will become familiar with the requirements of the General Permit and the maintenance and control measures outlined within this Plan. In addition, employees that are responsible for the maintenance of roads, berms, and drainage structures within the mining area and related storm water control structures outlined within this Plan will also be trained.

Training will also be provided to all other employees regarding chemical management; spill response procedures; storm water management; waste management; and associated topics. This training will be provided annually to employees as part of the annual refresher training courses. Additional training will be provided throughout the year as needed and depending on site-specific concerns or needs.

Appendix A
Site Maps

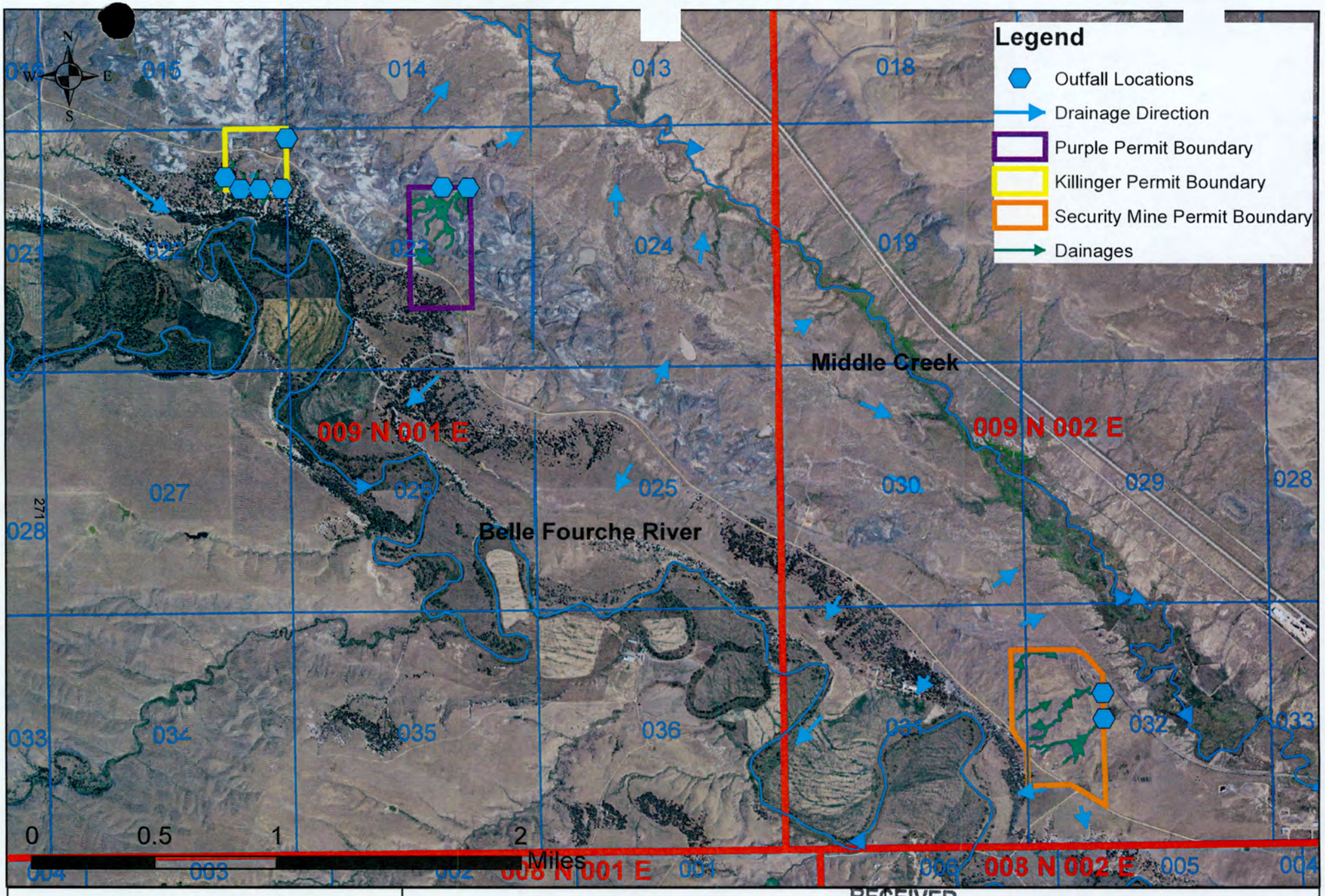


Figure One
Facility Overview Map
SWPPP

BENTONITE
Performance Minerals LLC

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MINERALS & MINING PROGRAM

554 US HWY 212
Belle Fourche, SD 57717

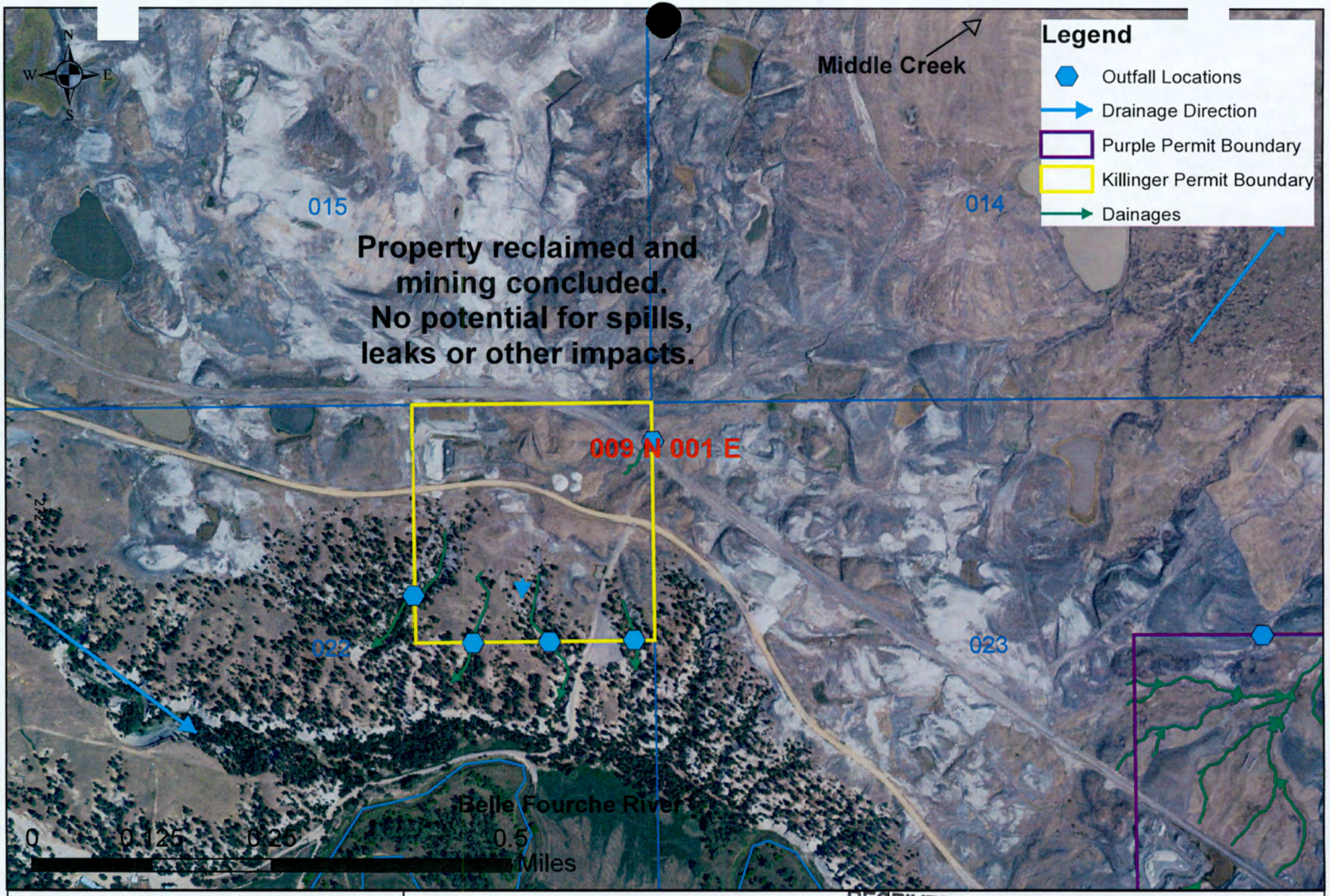
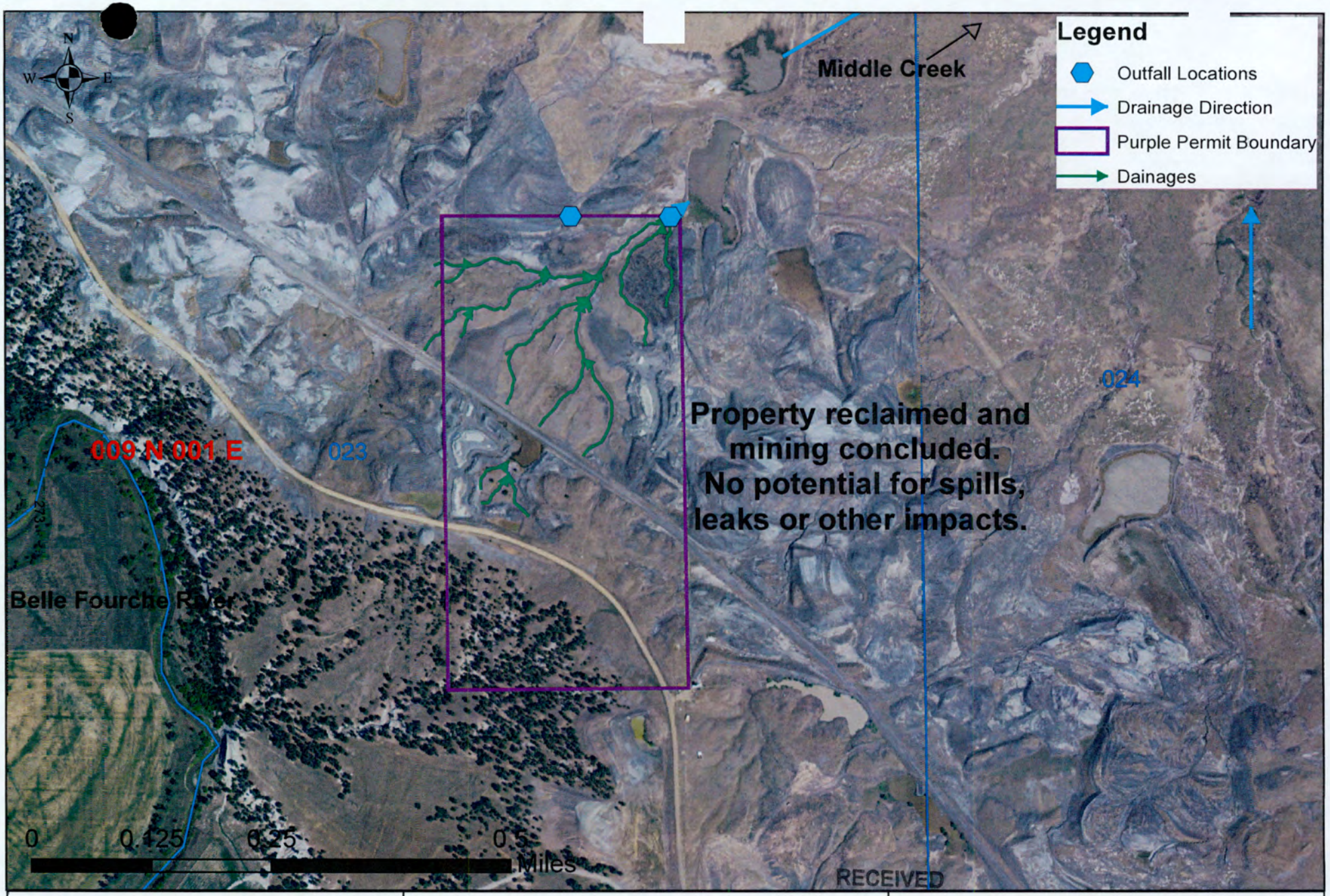


Figure Two
Killinger Site Map
SWPPP

BENTONITE
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Figure Three
Purple Site Map
SWPPP

BENTONITE
Performance Minerals LLC

554 US HWY 212
Belle Fourche, SD 57717

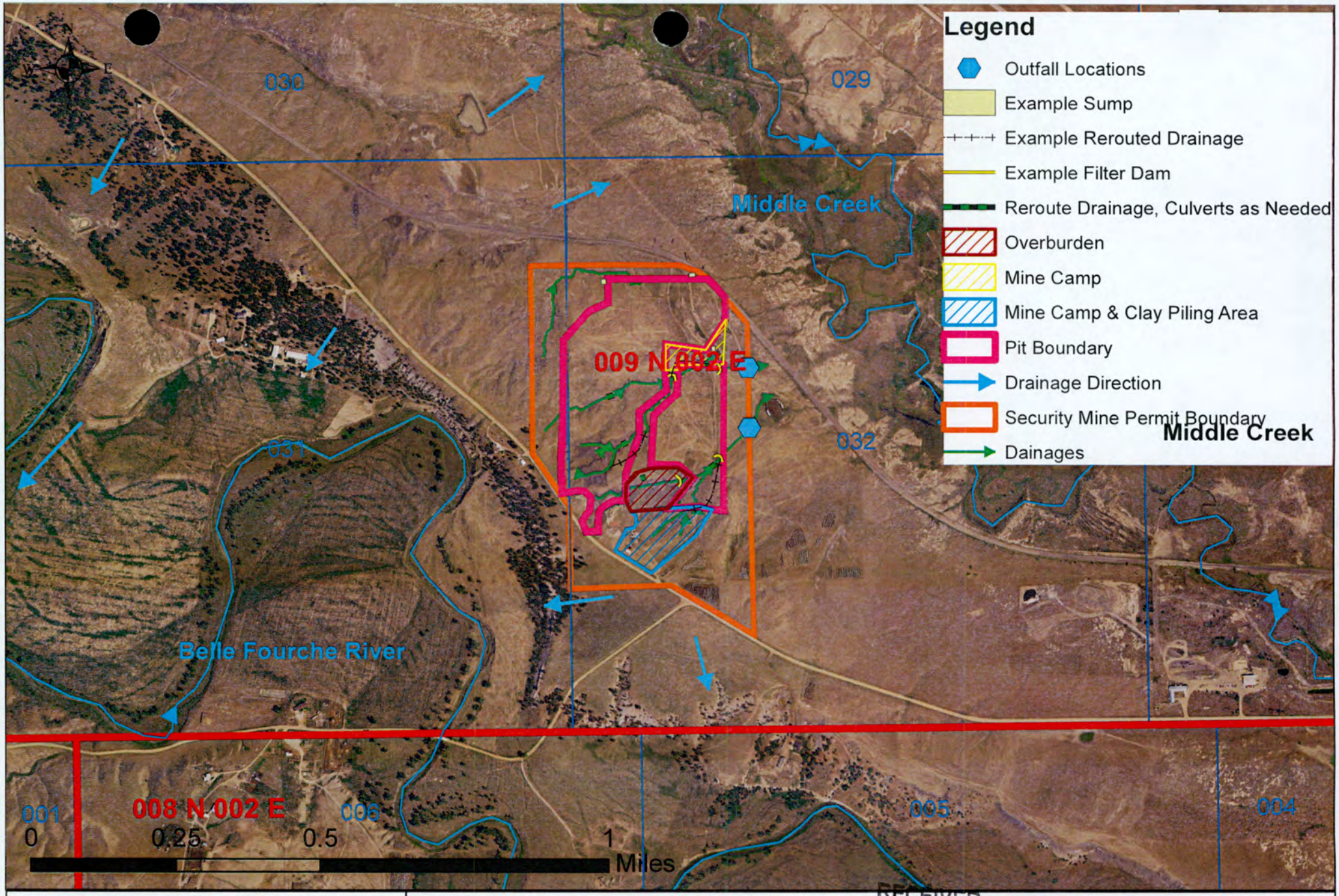


Figure Four
Security Site Map
SWPPP

BENTONITE
Performance Minerals LLC

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MINERALS & MINING PROGRAM

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Belle Fourche, SD 57717

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Appendix B

Storm Water Inspection Form

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Appendix C

Spill Prevention, Control and Countermeasure Plan (SPCC)

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Appendix D

General Permit for Storm Water Discharges Associated with Industrial Activities

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Appendix E

Completed Storm Water Inspection Forms

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Appendix F
Monitoring Summary

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HALLIBURTON

SPILL PREVENTION, CONTROL, AND COUNTERMEASURE PLAN

COLONY MINE CAMP SPCC PLAN
HALLIBURTON ENERGY SERVICES, INC.
BENTONITE PERFORMANCE MINERALS LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

NOVEMBER 2021

Prepared for:

HALLIBURTON ENERGY SERVICES, INC.
3000 NORTH SAM HOUSTON PARKWAY EAST
HOUSTON, TEXAS 77032

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LIST OF ACRONYMS AND ABREVIATIONS

API	American Petroleum Institute
AST	Aboveground Storage Tank
ARM	Administrative Rules of Montana
ARSD	Administrative Rules of South Dakota
BPM	Bentonite Performance Minerals
CFR	Code of Federal Regulations
CRDM	Continuous Release Detection Method
DES	Disaster and Emergency Services
EPA	U.S. Environmental Protection Agency
HSE	Health, Safety, and Environment
MTDEQ	Montana Department of Environmental Quality
NPDES	National Pollutant Discharge Elimination System
NRC	National Response Center
OWS	Oil-Water Separator
PE	Professional Engineer
POTW	Publicly Owned Treatment Works
PST	Petroleum Storage Tank
SDDENR	South Dakota Department of Environmental and Natural Resources
SDCL	South Dakota Codified Law
SPCC	Spill Prevention, Control, and Countermeasure
STI	Steel Tank Institute
U.S.	United States
UST	Underground Storage Tank
WDEQ	Wyoming Department of Environmental Quality

GENERAL INFORMATION SUMMARY

ITEM	INFORMATION
Facility Operator:	Halliburton Energy Services, Inc.
Facility Address:	554 US Hwy 212, Belle Fourche, SD 57717
Facility Location:	Approximately 22 miles northwest of Belle Fourche, South Dakota
Type of Facility:	Bentonite Mining Facility
Management Official for Facility:	Tyler Tetrault, Mine Manager
Phone Number:	Office: 307-896-8532 Mobile: 307-622-6932
Primary Facility Contact:	Tyler Tetrault, Mine Manager
Phone Number:	Office: 307-896-8532 Mobile: 307-622-6932
Emergency Coordinator:	Jared Waltz, HSE Coordinator
Phone Number:	Office: 307-896-6069 Mobile: 307-281-1894
Alternative Emergency Coordinator	Jaci Etzkorn, HSE Coordinator
Phone Number:	Office: 307-896-9144 Mobile: 605-490-0634
Wyoming Crook County Sheriff:	Main: 307-283-1225, Emergencies: 911
Wyoming Crook County Fire Department:	Main: 307-283-1441, Emergencies: 911
Wyoming Local Emergency Planning Committee:	Main: 307-283-2390
State of Wyoming Spill Emergency Reporting:	Main: 307-777-7781
Wyoming Department of Environmental Quality:	Main: 307-777-7937
Montana Carter County Sheriff:	Main: 406-775-8743
Montana Carter County Rural Fire Department:	Main: 406-775-8743
State of Montana Spill Emergency Reporting:	Main: 800-457-0568 Emergencies: 911 Outside normal business hours: 406-324-4777
Montana Department of Environmental Quality Enforcement Division:	Main: 406-444-0379

ITEM	INFORMATION
Belle Fourche, South Dakota Sheriff:	Main: 605-892-3324
Belle Fourche, South Dakota Fire Department:	Main: 605-892-6237
South Dakota Local Emergency Planning Committee:	Main: 605-892-3324
State of South Dakota Spill Emergency Reporting:	Main: 605-773-3296 After normal business hours: 605-773-3231
South Dakota Department of Environmental and Natural Resources:	Main: 605-773-5559
EPA Region 8 Emergency Response Center:	Main: 800-227-8917
National Response Center:	Main: 800-424-8802
Emergency Response Contractor:	Chemtrec: 800-424-9300 Interstate Power Systems: 307-682-8596

SUMMARY OF SPCC PLAN COMPLIANCE REQUIREMENTS

ACTIVITY	PLAN SECTION	FREQUENCY	REQUIREMENT	ADDITIONAL ACTIONS
Administrative Plan Review	Plan Review Log, Section 1.5	As necessary	Review and update the SPCC Plan with administrative changes.	Complete the Plan Review Log on Page x, and the Certification Statement in **Appendix A**.
Technical Plan Review	Plan Review Log, Section 1.5	As necessary, and once every five years	Review and update the SPCC Plan whenever there are technical changes and have those changes certified by a Professional Engineer (PE). The SPCC Plan must be reviewed at least once every five years and technical changes certified by a PE.	Complete the Plan Review Log on Page x and the Certification Statement in **Appendix A**. The SPCC Plan must be certified by a Professional Engineer.
Substantial Harm Determination	Appendix B	At least once, and update as necessary	The Management Official for the facility must complete and sign the Certification of Applicability of the Substantial Harm Criteria and update as necessary.	Maintain the signed Certification of Applicability of the Substantial Harm Criteria form in **Appendix B**.
Implementation Schedule	Appendix C	As required	Complete the items required by the certifying PE and listed in the Implementation Schedule in order to maintain compliance with the SPCC Plan regulations.	Complete the Implementation Schedule items in **Appendix C**.
Stormwater Drainage Inspection	Section 4.1	As required	If stormwater accumulates in a containment area, inspect prior to discharge using **Form 1 - Contained Storm Water Discharge Inspection Checklist**.	Maintain completed Contained Storm Water Discharge Inspection Checklist forms in **Appendix E**.
SPCC Equipment Inspections	Section 5.1	Once a month	Once a month, inspect SPCC-regulated aboveground storage tanks, portable/mobile containers, and oil-filled equipment (if present) using **Form 2 - Monthly SPCC Inspection Checklist**.	Maintain the completed Monthly SPCC Inspection Checklist in **Appendix F**.
Employee Training	Section 5.2	Once a year	Conduct annual SPCC Plan training and briefings as outlined in Section 5.3 of the SPCC Plan. Document the training or briefing using **Form 3 - Oil Spill Prevention Training Log**.	Maintain completed Oil Spill Prevention Training Logs in **Appendix G**.

ACTIVITY	PLAN SECTION	FREQUENCY	REQUIREMENT	ADDITIONAL ACTIONS
Fuel / Oil Transfers	Section 4.5	As required	During fuel/oil transfers, follow the steps in **Procedure 1 - Fuel, Bulk Oil and Oil-Based Products Transfer**.	Ensure vendors are aware of facility layout, emergency procedures, and oil transfer procedures.
Spill Response and Notification	Section 6.0	As required	In the event of an oil spill, follow the spill response and notification procedures in Section 6.0 – Spill Response, Cleanup, and Notification.	**If the oil discharge reached waters of the state, notify the National Response Center (800-424-8802) immediately.** Notify state and local agencies as outlined in Section 6.3 – Discharge Notification and Reporting. Record reportable spills on **Table 2 – Reportable Spill Log**.

REGULATORY CROSS REFERENCE TABLE

40 CFR Part 112 - Oil Pollution Prevention

REGULATORY STATUTE	REGULATORY DESCRIPTION	SECTION(S) OF PLAN
40 CFR 112.1	SPCC requirements and general applicability	1.2
§112.2	Definitions	Not required in Plan
§112.3(a)-(c)	Requirements to prepare and implement a Plan	Not required in Plan
§112.3(d)	Professional Engineer certification	Page ix
§112.3(e)	Plan availability	1.3
§112.3(f)	Extension for preparing Plan	Not applicable
§112.3(g)	Qualified Facilities	Not applicable
§112.4	Amendment of Plan by Regional Administrator	1.5
§112.5	Amendment of Plan by facility	1.5, Plan Review Log (Page x)
§112.6	Qualified Facility Plan Requirements	Not applicable
§112.7(a)(1)	Conformance with Plan requirements	1.0
§112.7(a)(2)	Deviations from requirements	No deviations
§112.7(a)(3)	Facility description	Page ii, 2.0, Figures 1-5
§112.7(a)(3)(i)	Oil storage	2.2.3, 4.2 through 4.4, Table 1
§112.7(a)(3)(ii)	Discharge prevention measures	3.0, 4.0, Procedure 1
§112.7(a)(3)(iii)	Discharge and drainage controls	4.1, Form 1
§112.7(a)(3)(iv)	Countermeasures for discharge	6.0
§112.7(a)(3)(v)	Methods of disposal of recovered materials	6.0
§112.7(a)(3)(vi)	Contact list	General Information Summary
§112.7(a)(4)	Reportable spill notification	6.3
§112.7(a)(5)	Readily accessible response procedures	6.0
§112.7(b)	Spill predictions	2.3.3, Table 3
§112.7(c)-(d)	Provide appropriate containment	3.1
§112.7(e)	Inspections, tests and records	5.1, 5.3, Form 2
§112.7(f)(1)-(3)	Oil handling training requirements	5.2, Form 3
§112.7(g)	Site security	3.2
§112.7(h)(1)	Loading/unloading rack area drainage and containment	3.3
§112.7(h)(2)	Warning or barrier system for loading/unloading rack	3.3
§112.7(h)(3)	Inspections prior to filling and departing of tank car/truck	3.3, Procedure 1
§112.7(i)	Field constructed ASTs	3.4
§112.7(j)	Conformance with other applicable requirements	3.5

REGULATORY STATUTE	REGULATORY DESCRIPTION	SECTION(S) OF PLAN
§112.7(k)(1)	Qualified oil-filled operational equipment	4.3, Table 1
§112.7(k)(2)	Alternative requirements to secondary containment	Not applicable
§112.8(a)	Meet requirements of 112.7	Throughout plan
§112.8(b)(1)	Drainage from diked storage areas	4.1.1, Form 1
§112.8(b)(2)	Valves of diked storage areas	4.1.1
§112.8(b)(3-5)	Drainage from undiked storage area	4.1.2
§112.8(c)(1)	Container compatibility	4.2
§112.8(c)(2)	Secondary containment of bulk storage containers	4.2
§112.8(c)(3)(i)-(iv)	Storm water drainage	4.1, Form 1
§112.8(c)(4)-(5)	Corrosive protection of USTs and partially buried tanks	4.2.3
§112.8(c)(6)	AST integrity testing	5.1.3
§112.8(c)(7)	Leakage through internal heating coils	4.2.1
§112.8(c)(8)(i)-(v)	Engineering of overfill prevention	4.2.1
§112.8(c)(9)	Observations of effluent treatment facilities	4.1.3
§112.8(c)(10)	Promptly correct visible discharges	6.0
§112.8(c)(11)	Location of mobile or portable containers	4.1.2, Table 1, Figures 3-5
§112.8(d)(1)	Cathodic protection of buried piping	4.5.1
§112.8(d)(2)	Out-of-service or stand-by service connections	4.5.2
§112.8(d)(3)	Pipe support design	4.5.3
§112.8(d)(4)	Inspection of aboveground valves, piping and appurtenances	4.5.4, 5.1, Form 2
§112.8(d)(5)	Vehicle warning	4.5.5
§112.9	SPCC Plan requirements for onshore oil production facilities	Not applicable
§112.10	SPCC Plan requirements for onshore drilling & workover facilities	Not applicable
§112.11	SPCC Plan requirements for offshore oil facilities	Not applicable
§112.12	SPCC Plan requirements for animal/plant oil onshore facilities	Not applicable
§112.20	Certification of Applicability of Substantial Harm Criteria	Appendix B
§112.21	Facility response training and drills/exercises	Not applicable

MANAGEMENT CERTIFICATION

Halliburton Energy Services, Inc.

Bentonite Performance Minerals LLC

554 US Hwy 212

Belle Fourche, SD 57717

This Spill Prevention Control and Countermeasure (SPCC) Plan will be implemented to prevent, control, and counteract spills and accidental discharges of oil and oil-based products from the facility to navigable waters and the environment.

This SPCC Plan, as required by law, will be made available at the facility office for on-site review by the U.S. Environmental Protection Agency Regional Administrator, an authorized representative of the Wyoming Department of Environmental Quality or a duly authorized representative, during normal working hours.

In accordance with 40 CFR §112.7, I certify that this SPCC Plan has the full approval of Halliburton Energy Services, Inc. at the management level, and I have the authority to commit the personnel and resources necessary to implement the plan.

Signature: _____

Name: Tyler Tetrault

Title: Mine Manager

Date: 11/23/21

PROFESSIONAL ENGINEER CERTIFICATION

Halliburton Energy Services, Inc.

Bentonite Performance Minerals LLC

554 US Hwy 212

Belle Fourche, SD 57717

I hereby certify that I am familiar with the provisions of Title 40 of the Code of Federal Regulations, Part 112 (40 CFR §112), and attest that I have visited and examined the facility or has supervised examination of the facility by appropriately qualified personnel. This Spill Prevention Control and Countermeasure (SPCC) Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and the requirements of 40 CFR §112; that procedures for required inspections and testing have been established; and that this SPCC Plan is adequate for the facility.

This certification in no way relieves the owner or operator of the facility of his/her duty to prepare and fully implement this SPCC Plan in accordance with the requirements of 40 CFR §112.

Engineer: CODY MCGUIRE, P.E.



Signature: _____

Seal Date: 11/12/2021

Registration Number: 16563

State: Wyoming

HALLIBURTON

SPCC PLAN REVIEW LOG

Halliburton Energy Services, Inc.

Bentonite Performance Minerals LLC

554 US Hwy 212

Belle Fourche, SD 57717

As outlined in **Section 1.5** of the Spill Prevention, Control, and Countermeasure (SPCC) Plan, in accordance with the 40 CFR 112.5(b), a review and evaluation of the SPCC Plan is conducted and documented below.

In addition, a certified statement indicating the review and evaluation were completed, and whether amendments to the SPCC Plan are required, is documented using the certified statement provided in **Appendix A**.

Review Date	Review Type			P.E. Recertification Required?	Comment(s)
	Administrative	Technical	5-Year		
May 2021		X		Yes	Addition of oil storage containers
November 2021		X		Yes	Additional mining area in South Dakota

1.0 INTRODUCTION

This Spill Prevention, Control, and Countermeasure (SPCC) Plan was prepared for the Halliburton Energy Services, Inc. (Halliburton) – Bentonite Performance Minerals LLC (BPM) facility located within an unincorporated area of Crook County, WY with an official address of 554 US Hwy 212, Belle Fourche, SD 57717, as shown on **Figure 1 – Facility Location Map**. The SPCC Plan has been prepared in accordance with Title 40 of the Code of Federal Regulations, Part 112 (40 CFR §112) – *Oil Pollution Prevention* and the Wyoming Department of Environmental Quality (WDEQ) Water Quality Division, Chapter 4 – *Releases of Oil & Hazardous Substances into Waters*, as applicable to the facility.

1.1 Objectives of the SPCC Plan

The objectives of the SPCC Plan are to:

1. Prevent the discharge of oil, oil-based products, and other regulated material into navigable waters of the United States (U.S.) by using good engineering practices and management controls;
2. Describe the measures implemented at the facility to prevent oil discharges from occurring; and
3. Prepare Halliburton to respond in a safe, effective, and timely manner to mitigate the impacts of a discharge.

1.2 Regulatory Applicability

In accordance with 40 CFR §112, all facilities engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and oil-based products must prepare and implement an SPCC Plan if they meet the following criteria:

1. The facility is non-transportation-related;
2. The total aboveground storage capacity of oil (containers with capacities equal to or greater than 55 gallons and including oil-filled operational equipment) is more than 1,320 gallons, or the total underground storage capacity of oil is greater than 42,000 gallons; and
3. The facility, due to its location, could reasonably be expected to discharge oil in quantities that may be harmful into or upon the navigable waters of the United States or adjoining shorelines.

The facility stores approximately 48,335 gallons of oil and oil-based products that could reasonably be expected to discharge into navigable waters of the U.S. or adjoining shorelines. Therefore, the facility is required to prepare and implement an SPCC Plan in accordance with U.S. Environmental Protection Agency (EPA) and Wyoming Department of Environmental Quality regulations. See the *Regulatory Cross Reference Table* for a summary of applicable sections in 40 CFR §112.

According to the criteria in 40 CFR §112.20(f)(1), Halliburton has determined the facility does not pose a risk of substantial harm to the environment by discharging oil or oil-based products into or onto navigable waters. See the *Certification of Substantial Harm Determination* included in **Appendix B**. Therefore, the facility response requirements in §112.20 and §112.21 do not apply.

1.3 Plan Availability

A complete copy of the SPCC Plan is maintained at the facility and is available to Halliburton personnel. The SPCC Plan will be provided upon request to local, state, and federal agency personnel with

jurisdiction for review during normal business hours (i.e., 7:00 AM to 4:00 PM, Monday through Friday) during a facility inspection.

1.4 U.S. EPA Plan Review and Amendment

In the event EPA reviews the SPCC Plan during a facility inspection and requests to amend the SPCC Plan, Halliburton has 30 days from receiving the notice from EPA to file a written appeal. Otherwise, amendments to the SPCC Plan will be completed within 30 days of receiving EPA's request to modify the SPCC Plan and will be implemented as soon as practical, but no later than six months.

1.5 Facility Plan Review, Amendment and Certification

Halliburton periodically reviews and evaluates the SPCC Plan for modifications at the facility. A log of each amendment to the SPCC Plan is documented in the Plan Review Log on Page x and certified statements are maintained in **Appendix A**. The three types of amendments are described below.

- **Technical Amendments**

  These are changes in facility configuration which can include changes in the facility design, construction, operation, or maintenance that materially affect the facility's potential for an oil or oil-based product discharge. This includes (but is not limited to) adding, removing, or modifying containers; reconstruction, replacement, or installation of piping systems; altering secondary containment structures; changes in products or services; changes to the inspection program; and the use of new or modified industry standards.

  Technical amendments to the SPCC Plan must be prepared and certified by a Professional Engineer (PE) within six months of making these changes.

- **Administrative Amendments**

  These are changes to the SPCC Plan that do not affect the potential of the facility to discharge oil or oil-based products and include (but are not limited to) personnel changes and changes in the name or contact information of spill response or cleanup contractors.

  Administrative amendments to the SPCC Plan will be completed by Halliburton and do not need to be prepared or certified by a PE.

- **Five-Year Reviews**

  As required by 40 CFR §112.5(b), the SPCC Plan is formally reviewed and recertified, if necessary, by a PE at least once every five years.

1.6 Cross-Reference with SPCC Plan Provisions

This SPCC Plan may not follow the exact order presented in 40 CFR §112. As a result, a regulatory cross-reference of the SPCC Plan sections relative to the applicable parts of 40 CFR §112 is included on Pages vi and vii.

1.7 Non-Compliance with the SPCC Plan Rules

If the PE has identified non-compliance items at the facility in relation to the SPCC Plan rules, the certification of the SPCC Plan is contingent upon and affirms that Halliburton has agreed to:

- Address the items listed in **Appendix C - Implementation Schedule**, as applicable;

- Allocate the necessary funds to execute the items listed in the Implementation Schedule; and
- Implement the modifications no later than six months from the PE certification date.

2.0 FACILITY INFORMATION

2.1 Facility Location

Facility Name:	Halliburton Energy Services, Inc. – Bentonite Performance Minerals LLC
Facility Address:	554 US Hwy 212, Belle Fourche, SD 57717
Responsible for Implementing Plan:	Halliburton Energy Services, Inc. – Bentonite Performance Minerals LLC
Management Official for Facility:	Tyler Tetrault, Mine Manager
Primary Facility Contact:	Tyler Tetrault, Mine Manager Office: 307-896-8532 Mobile: 307-622-6932

2.2 Facility Details

2.2.1 Facility Description

The Halliburton facility is located at 554 US Hwy 212, Belle Fourche, SD, within an unincorporated area of Wyoming approximately 22 miles northwest of Belle Fourche, South Dakota. The location of active pit mining varies based on the raw clay required at the plant for production. The principal land uses in the vicinity of mine areas are bentonite mining, bentonite production and processing, recreation, and ranching.

Figures 3, 4, and 5 show the site features, structures, drainage, and location of oil and oil-based products storage.

2.2.2 Facility Operations

Operational hours at the facility vary depending on clients' field requests and work schedule. However, a complete copy of the SPCC Plan will be maintained at the facility and available for review during normal working hours, 7 AM – 4 PM.

Halliburton operates the facility as a bentonite clay mining facility in Crook County, Wyoming adjacent to the Colony Plant as well as long haul pit operations in Wyoming, Montana, and South Dakota. The locations of the long haul operations are presented in **Figures 2a and 2b**. Raw bentonite clay is mined in pits with excavation equipment that is refueled and serviced from remote mobile work camp facilities in the general vicinity of the mine pits. These sites are typically on company property or private leased lands away from regularly traveled public roads. Access is often via private ranch roads. The raw clay is transported by over-the-road tractor trailer dump vehicles. Petroleum fuel can be stored in secure trailer-mounted tanks parked at the mine camps. Mobile refueling tanks used for refueling mine equipment are filled from the bulk fuel dispensers located at the Long Haul and Short Haul Staging areas. No vendor delivery of fuel or lubricants to the camp areas is anticipated. Petroleum products used for vehicle lubrication and vehicle maintenance activities are primarily stored in a secure maintenance area. Used oil is collected and temporarily stored in a secure trailer-mounted tank at the Mine Camp. Used oil is periodically transferred to a permanent Used Oil storage tank located at the BPM Colony Field Shop.

This tank is covered under the separate Colony Plant SPCC Plan and is therefore not included in this Colony Mine Camp SPCC Plan.

2.2.3 Facility Oil and Oil-Based Products Storage

The facility has several locations where oil and oil-based products are stored, including the following areas:

- **Camp Areas for both Long Haul and Short Haul**
  - Aboveground Storage Tanks (ASTs)
  - Tank Trucks
  - Drums
  - Oil-filled Operational Equipment
- **Long Haul Staging Area**
  - ASTs
  - Tank Trucks
- **Short Haul Staging Area**
  - ASTs

SPCC-regulated equipment with oil-storage capacities of 55 gallons or greater, including ASTs, portable/mobile containers, oil-filled operational equipment, and tank trucks (mobile refuelers or other non-transportation-related tank trucks) are listed in **Table 1 – Oil and Oil-Based Products Storage Information** and described in detail in Sections 4.2 through 4.4.

Oil storage containers and oil-filled operational equipment having a capacity less than 55 gallons are not specifically addressed in the SPCC Plan. However, general good housekeeping and spill prevention measures will be followed.

2.3 Evaluation of Discharge Potential

2.3.1 Distance to Navigable Waters/Shorelines

The general topography can be characterized as rolling hills and ravines with areas of relatively level range and storm water drainage generally flowing to the south. Elevation of the camp areas may vary from 3,100 feet to 3,900 feet. The facility's general location, topographic features, and potential receiving waters are shown on **Figure 1 – Facility Location Map**.

Each camp facility will have a single final discharge point at the lowest point of the facility perimeter. These points are sited and maintained as described in Section 4.1.1.

Retained precipitation must be inspected prior to drainage and must not be discharged directly into a watercourse without cleanup or treatment if the inspection shows visible evidence of a sheen on the surface, layers or droplets of free product, or sludge. Each Mine Camp area will have a discharge point should the containment / perimeter berm overtop. These will vary in location and be site specific. The camp sites should be planned, located, and constructed to minimize any potential impact from overtopping on waters of the U.S., waters of the State, or non-jurisdictional surface water bodies as described in Section 4.1.1.

2.3.2 Spill History

Discharges of oil that result in agency notification are recorded in **Table 2 – Reportable Spill Log**.

2.3.3 Potential Spill Prediction and Control

Scenarios with a reasonable potential for equipment failure resulting in a discharge of oil or oil-based products, including a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility and means of control, are shown in **Table 3 – Potential Discharge Volume and Direction of Flow**.

Spill prevention controls include training, operating procedures, leak detection systems, inspections, and secondary containment; as described in Sections 3.0, 4.0, and 5.0 of the SPCC Plan.

3.0 GENERAL SPILL PREVENTION MEASURES

3.1 Containment and Diversionary Structures

SPCC-regulated equipment with oil-storage capacities of 55 gallons or greater are provided with appropriate containment or diversionary structures capable of containing oil and oil-based products and of preventing offsite discharge. Appropriate containment can be *passive* (e.g., impervious dikes, berms or retaining walls, drip pans, sumps, detention ponds, sloped building floors, containment pallets) or *active* (e.g., spill response).

All Mine Camp areas have storage areas with earthen perimeter berms, as referenced on **Figure 3** and **Table 1**. The topsoil of the camp area is stripped off the clay and stockpiled. The camp is then surrounded by a graded and compacted perimeter berm. This berm limits excessive run-on flowing onto the site and allows containment of precipitation that falls on the camp area for inspection and cleanup. The camp site floor is graded (~2% depending on terrain) for drainage and is typically directed towards a containment sump. Storm water is collected along with potential petroleum spills.

The tanks in the Long Haul Staging Area are stored within an earthen berm with a liner, as referenced in **Table 1**. Secondary containment calculations for the berm are provided in **Appendix D**. When not in use, mobile refuelers are stored within either the earthen perimeter berm at the camp area or a designated bermed area with a sump in the Long Haul Staging Area where spill kits are stored and kept fully stocked. The interstitial space of the double walled tank in the Short Haul area provides the required secondary containment for the tank.

Best Management Practices (BMPs) that will be used at the facility to contain small leaks from dispenser hose connections at the diesel and gasoline equipment fueling locations are:

- Sturdy drip pans must be placed beneath the fill ports when vehicles and equipment or the aboveground storage tanks are being filled. Drip pans are to be used during lubrication fluid transfers at fill and drain locations.
- Spill kits are located at the Long Haul Staging Area, Short Haul Staging Area, and are also stored on mobile refueler trucks.

Periodically, at the routine Environmental and Safety training sessions, the need for reporting shall be stressed. All BPM personnel shall be reminded to observe and report releases of petroleum products to land or water to their BPM supervisors that can act to control the release. BPM personnel are also instructed to report small leaks or sheens they encounter which indicate the potential need for cleanup and possible preventative maintenance. The purpose of the training will not be to review the SPCC Plan itself but rather to make BPM personnel aware that they have a responsibility to observe and notify the SPCC Coordinator in the event of a release that might reach any surface water body or channel.

Oil and oil-based storage containers and their containment structures are presented in **Table 1 – Oil and Oil-Based Products Storage Information,** shown on **Figures 3, 4, and 5**, and described in detail in Sections 4.2 through 4.4 of this SPCC Plan.

3.2 Facility Security

3.2.1 Perimeter Fence/Guard

The mine pit and camp locations may or may not have ranch fencing and gates depending on the specific location. Individual mine camp sites do not have perimeter security fencing. Due to the mobile nature of the camp areas, individual trailer-mounted tanks will not be fenced. Tank valves, fill ports, and

hose storage cabinets will be locked when not in use to prevent vandalism and unauthorized releases. Consistent with BPM site access policy, the camp area entrances are signed to indicate that heavy equipment is in use, that an employee escort is required, and that only authorized access is allowed. BPM local management has decided that specific signage to identify the oil storage facilities would only call unwanted attention to equipment and storage. Through regular training and briefings, BPM staff and visitors will be aware of the location of the mine camps and the necessary precautions required at these facilities. Safety and emergency response personnel will be briefed on the locations and types of equipment on site in case of an emergency.

3.2.2 Master Flow and Drain Valves

When not in operation, any master flow and drain valves that permit the direct outflow of a container's and containment's contents to the surface are secured in the closed position with padlocks.

3.2.3 Oil Pump Starter Controls

When not in operation the starter controls for the main fueling diesel and gasoline areas are padlocked in the "OFF" position. The padlocks must be physically removed by the operators prior to fueling. They are accessible only to authorized personnel.

3.2.4 Standby or Not-In-Service Piping and Hoses

All tanks in the mine camps use pumped hose connections for dispensing fuel and oils. Terminal connections at transfer points are securely capped or blank-flanged when piping/hoses are not in service or are in standby service for an extended time, including those emptied of liquid contents by draining or inert gas pressure.

3.2.5 Lighting

Individual camp sites do not have security lighting. Due to the remote nature of the camp areas, it is recommended that no site lighting is provided. It was decided by local BPM management that camp facilities lighted during unattended hours will call unwanted attention to the storage facilities; making it easier to locate the facilities for unauthorized access. It is possible that the rural population may find an illuminated tank or storage trailer an enticing target for hunting weapons with extended ranges that are typically carried in personal vehicles. Personnel inspecting camp facilities during nonoperational periods will be equipped with sufficient personal lighting to make accurate and complete inspections for leaks and ruptures of storage vessels.

3.3 Facility Loading/Unloading Rack

The facility does not have any tank truck racks used for fuel transfer. The Mine Camp area does not have a designated loading/unloading area for fuel transfers during delivery. Bulk delivery transfers, if necessary, will be conducted within the bermed mine camp area. In case of a spill, flow drains into a secondary containment sump which is able to contain the maximum capacity of any single compartment of a truck transferring fuel at the camp facility. A permanent fuel transfer area is located in the Long Haul and Short Haul Staging areas.

In accordance with the BPM Field Fueling procedures, BPM personnel are present prior to, during, and after fuel transfers to visually inspect drains, outlets, fittings, and hoses. BPM personnel use drip pans and take measures to ensure that all valves are tightened, secured, adjusted, and replaced if necessary.

Facility transfer operations are described in Section 4.5.

3.4 Field Erected ASTs Repair, Alteration, Reconstruction, or Service Change

This facility does not have any field erected ASTs.

3.5 Conformance with Other Regulations

3.5.1 Department of Transportation Requirements

This facility is subject to U.S. Department of Transportation (DOT) regulations related to oil spill prevention during transportation of oil by motor vehicles.

Applicable fluid-transfer requirements from U.S. DOT regulations in 49 CFR 177.834 and 177.837 are implemented at the facility, including:

- Proper securing of containers;
- No smoking around vehicle;
- Setting of emergency brake;
- Continuous attendance during loading/unloading;
- Inspection of vehicle before departure;
- Restrictions on cargo space heaters; and
- Bonding and grounding of containers.

Oil transfer procedures are described in Section 4.5. Facility personnel will implement the necessary steps included in **Procedure 1 – Fuel, Bulk Oil, and Oil-Based Products Transfer Procedures**.

Additionally, Halliburton will coordinate with the vendors to ensure they understand the site layout and the protocols for loading and unloading products and liquid transfer activities and will verify that vendors have the necessary equipment to respond to a spill during these operations.

3.5.2 Wyoming Department of Environmental Quality

The WDEQ requires that cleanup of oil or hazardous substance releases shall proceed in a timely and diligent manner. Satisfactory cleanup of an oil or hazardous substance release will be achieved when one, or both, of the following cleanup criteria have been met:

- Oil releases shall not be present in or threaten waters of the state in amounts which would cause any one of the following conditions:
  - Oil and grease content to exceed 10 mg/l;
  - Visible deposits on the bottom or shoreline; or
  - Damage or impairment of the normal growth, function, or reproduction of human, animal, plant, or aquatic life.

- Hazardous substances shall not be present in, or threaten, waters of the state in concentrations or combinations which, as determined by the WDEQ administrator, would damage or impair the normal growth, function, or reproduction of human, animal, plant, or aquatic life, or impair the beneficial use of any waters of the state.

As a result, in compliance with the regulations and in an event of a reportable release, Halliburton will provide the WDEQ with the proper notification as detailed in Section 6.0.

3.5.3 Montana Department of Environmental Quality

The Montana Department of Environmental Quality (MTDEQ) requires that all releases or spills of hazardous or deleterious substances or other wastes, regardless of size, must be properly and expeditiously managed, contained, and removed to protect public health and the environment. Halliburton will provide the MTDEQ with the proper notification of releases or spills as detailed in Section 6.0.

3.5.4 South Dakota Department of Environmental and Natural Resources

The South Dakota Department of Environmental and Natural Resources (SDDENR) requires that if a release greater than 25 gallons occurs, immediate actions must be taken to prevent runoff from migrating to any surface water body. Actions may include putting up dikes, utilizing some type of absorbent material such as soil, kitty litter, or floor dry, or covering the area with a tarp. Attention should be paid to the presence of petroleum vapors and the risk that these vapors present. The responsible person may also be required to take action to prevent access to the spill area by the public (putting up fences, etc.).

In situations where the release quantity does not exceed 200 gallons, the responsible person has several cleanup options. **The responsible person must propose the preferred remedial option to the department and must gain department approval before proceeding with the corrective action.** These options may include:

- Assess the site and determine the cleanup level using the Risk Based Corrective Action approach described in SDDENR's Petroleum Assessment and Cleanup Handbook (Handbook);
- Remove a minimum of the top 12 inches of visibly contaminated soil, and replace it with clean fill (no cleanup confirmation sampling will be necessary); or
- Conduct a survey to identify possible receptors. SDDENR will review this information to determine if cleanup is necessary.

Once the corrective action is completed, a report must be submitted to SDDENR for review. The report should contain the following information: any data collected during or after cleanup; the location of the contaminated soil disposal or treatment facility; and a narrative explaining the work that was conducted.

If the release is greater than 200 gallons then the responsible person must proceed with assessment and remediation of the site using the tiered approach described in Chapter 4 of the Petroleum Assessment and Cleanup Handbook.

4.0 SPILL PREVENTION MEASURES SPECIFIC TO ONSHORE FACILITIES

4.1 Facility Drainage

4.1.1 Drainage from Diked Storage Areas

All Mine Camp areas have storage areas with perimeter berms, as referenced on **Figure 3** and **Table 1**. The facility uses manually activated portable gasoline operated pumps to drain retained precipitation from the containment sumps in camp storage areas shown on **Figure 3**. Camp locations are selected to minimize any potential threat from possible spills reaching waters of the State or waters of the U.S. These locations will be well distanced from flowing surface water, springs, wetlands, or water impoundments connected to intermittent or flowing water courses. Camp discharge points will be positioned away from ditches or swales that would convey spills to stream courses; preferably positioned at flat vegetated areas to spread potential flows and filter discharges. Surface drainage flow direction and paths are site specific.

The camp area topsoil is stripped off the clay and stockpiled. The camp is then surrounded by a graded and compacted perimeter berm. This berm limits excessive run-on flowing onto the site and allows containment of precipitation that falls on the camp area for inspection and cleanup. The camp site floor is graded (~2% depending on terrain) for drainage and is typically directed towards a containment sump. Storm water is collected along with potential petroleum spills. This catchment sump typically has a capacity of 2,000 gallons and freeboard of 1 foot. The volume capacity of the catchment will be confirmed during construction and prior to mobile fueling tank operation. Camp containment sumps are manually pumped to remove precipitation collected there. Prior to pumping, these sumps are inspected for oil products and cleaned.

The typical equipment and camp layout configuration is depicted in **Figure 3**. The region's clay soil is typically adequate to prevent any spilled oil from infiltrating into more permeable native soils. In cases where clay soils may be inconsistent or may not be of sufficient quantity, mined clay or clay overburden will be imported to protect the subsurface soils from spill contamination. Clay soil coverage and suitability will be confirmed during construction and prior to mobile tank operations. Mine pits are typically 30 feet or more in depth and exhibit subsurface confining clay layers in the strata above the target formations. Additionally, mine pit floors are above groundwater levels, indicating a significant depth required for spill material to penetrate in order to infiltrate groundwater. Mine pit sumps are manually pumped to remove precipitation runoff collected there. Prior to pumping, these sumps are inspected for oil products and cleaned.

The tanks in the Long Haul area are stored within an earthen berm with an impermeable liner, as referenced in **Table 1**. Secondary containment calculations for the berm are provided in **Appendix D**. When not in use, mobile refuelers are stored within either the earthen perimeter berm at the camp area or a designated bermed area with a sump in the Long Haul Staging Area where spill kits are stored and kept fully stocked.

If stormwater accumulates in a containment area, the stormwater evaluation is documented using **Form 1 – Contained Storm Water Discharge Inspection Checklist**. Completed checklists are maintained in **Appendix E** for a minimum of three years.

4.1.2 Drainage from Undiked Storage Areas

The mine camp areas have no undiked storage areas. Site specific catchment basins are constructed for each site so that they have the ability to stop flow from leaving the facility if a release occurs.

4.1.3 Effluent Treatment Facilities

The facility does not have any wastewater treatment units or oil-water separators designed to treat or remove oil from wastewater or runoff.

4.2 Bulk Storage Containers

4.2.1 Aboveground Storage Tanks

Aboveground storage tanks (ASTs) with a shell capacity of 55 gallons or greater that hold oil or oil-based products are listed in **Table 1 – Oil and Oil-Based Products Storage Information** and shown on **Figures 3, 4, and 5**.

AST material and construction are compatible with the material stored and conditions of storage, such as pressure and temperature.

This facility does not have any containers with internal heating coils. ASTs are provided with secondary containment sized for 110 percent of the volume of the largest single container, where practicable. Secondary containment capacity calculations are in **Appendix D**. Diked areas are sufficiently impervious to contain discharged oil.

ASTs are inspected and tested for integrity on a regular schedule in accordance with industry standards, as described in Section 5.1. In general, visual inspection may be combined with another appropriate non-destructive shell testing method. Inspections of tank supports and foundations are part of the inspection process and the outside of tanks are frequently inspected for signs of deterioration, discharges, and accumulations of oil inside secondary containment areas.

ASTs are engineered or updated in accordance with good engineering practice to avoid discharges and are provided with at least one of the following means of overfill protection:

- High-liquid level alarms with an audible or visual signal at a constantly attended operation;
- High-liquid level pump cutoff devices set to stop flow at a predetermined container content level (e.g., automatic fuel-nozzle back-pressure shutoff);
- Direct audible or code signal communication between the container gauger and the pumping station; or
- A fast-response system for determining the liquid level such as digital computers, telepulse, or direct vision gauges. Note: If you use this alternative, a person must be present to monitor gauges and the filling operations.

4.2.2 Mobile / Portable Storage Containers

Mobile or portable oil storage containers, including drums, totes, and trailer- or truck-mounted fuel tanks with a capacity of 55 gallons or greater, are listed in **Table 1 – Oil and Oil-Based Products Storage Information**. Typical storage locations are shown on **Figure 3 – Typical Camp Layout**.

Containers are compatible with the material stored and conditions of storage, such as pressure and temperature. They are positioned to prevent discharges and are provided with secondary containment sufficient to contain 110 percent of the volume of the largest single container.

Containers are inspected and tested for integrity on a regular schedule in accordance with industry standards, as described in Section 5.1.

4.2.3 Underground, Partially Buried and Bunkered Metallic Tanks

The facility has no underground, partially buried or bunkered metallic oil storage tanks.

4.3 Oil-Filled Equipment

Oil-filled equipment contains oil solely to enable the operation of the device. Oil-filled equipment with a capacity of 55 gallons, or greater, is listed in **Table 1 – Oil and Oil-Based Products Storage Information** and shown on **Figure 3 – Typical Camp Layout**.

General secondary containment is provided for oil-filled operational equipment.

Oil-filled equipment is maintained according to manufacturer specifications to prevent and/or minimize leaks and is inspected on a routine basis.

4.4 Non-Transportation-Related Tank Trucks

Mobile refuelers and other non-transportation-related tank trucks are listed in **Table 1 – Oil and Oil-Based Products Storage Information**. Vehicle staging areas are shown on **Figures 3 and 4**.

While mobile refuelers are exempt from sized secondary containment requirements, general secondary containment is provided for mobile refuelers and other non-transportation-related tank trucks.

Facility oil transfer operations are described in Section 4.5.

4.5 Facility Transfer Operations and Piping

Loading/unloading activities at the facility include loading of petroleum-based liquids into tanks, totes, and drums located at the mine camp sites and Long Haul and Short Haul areas. Halliburton personnel monitor container levels during oil, oil-based, and oily water/used oil transfer operations as detailed in **Procedure 1 – Fuel, Bulk Oil, and Oil-Based Products Transfer**.

As applicable, fluid transfers are coordinated with the third-party vendors. They are made aware of the site layout and instructed on protocols for loading and unloading products. Halliburton also verifies they have the necessary equipment to respond to a spill during transfer operations.

4.5.1 Cathodic Protection of Buried Piping

This facility does not have any underground piping.

Any underground piping installed or replaced in the future must have a protective wrapping and coating applied and provisions made for cathodic protection or other technique used to satisfy the corrosion protection standards applicable in 40 CFR 280.31 or 281. If any future section of buried piping of any age becomes exposed for any reason, it must be inspected carefully and documented accordingly. If any corrosion damage is found, further examination and corrective actions must be taken to repair the piping as indicated by the magnitude of damage. New underground piping must be tested for integrity

and leaks by a Piping Inspector certified to applicable industry or State standards at the time of installation.

4.5.2 Out-of-Service or Standby Service Terminal Connections

All tanks in the mine camps use pumped hose connections for dispensing fuel and oils. Terminal connections at transfer points are securely capped or blank-flanged when piping/hoses are not in service or are in standby service for an extended time.

4.5.3 Pipe Support Design

This facility does not have any applicable piping or pipe supports.

4.5.4 Inspections of Aboveground Valves, Piping, and Appurtenances

Regulated aboveground piping, valves, and other appurtenances are inspected as described in Section 5.1. Inspection includes aboveground valves, piping, appurtenances, support structures, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces.

4.5.5 Vehicle Warning

Vehicles entering the facility are warned to ensure that no vehicle will endanger aboveground piping or other oil transfer operations. All vehicles and visitors entering the facility are required to complete site specific hazard training. Part of this training includes that vehicles are restricted from accessing aboveground oil transfer areas. No vehicles other than facility vehicles are allowed in oil transfer areas without being accompanied by an employee.

The camp fueling and service areas are monitored by maintenance staff. Mine equipment drivers are trained in operations at and near fuel tanks and the associated hose service areas. BPM equipment service personnel are trained in the operation of, and are responsible for, proper storage and maintenance of the equipment in the service area in order to prevent damage to the fuel and oil transfer equipment.

5.0 INSPECTIONS, TESTS, PERSONNEL TRAINING AND RECORDKEEPING

5.1 Inspections and Testing

The inspection and testing requirements of the SPCC rule are intended to prevent, predict, and detect potential integrity or structural issues before they cause a leak, spill, or discharge of oil. Qualified Halliburton facility personnel will conduct regular scheduled inspections and testing on tanks, containers, piping, valves, and other equipment and components that could cause a discharge. The scope of the inspections and associated procedures are covered in the training provided to personnel involved in handling oil at the facility, as described in Section 5.2.

Based on good engineering practice, oil storage tanks and containers (and associated appurtenances, piping, and containment) are visually inspected in accordance with the Steel Tank Institute (STI) *Standard for the Inspection of Aboveground Storage Tanks SP001 issued January 2018, 6th Edition* (STI SP001), as shown in **Table 1 – Oil and Oil-Based Products Storage Information** and described below.

Additionally, ASTs receive scheduled integrity inspections by a certified tank inspector, as described in Section 5.1.3.

Oil-filled equipment and non-transportation-related tank trucks are inspected in accordance with manufacturer's specifications.

5.1.1 Monthly Inspections

Qualified Halliburton facility personnel complete the required monthly inspections in accordance with STI SP001 using **Form 2 – Monthly SPCC Inspection Checklist.**

The monthly inspections cover the following key elements:

- Observing the exterior of aboveground storage tanks, pipes, and other equipment for signs of deterioration, leaks, corrosion, and thinning;
- Observing secondary containment areas for signs of deterioration, accumulated oil, and accumulated precipitation or other debris that may preclude containment capacity requirements;
- Observing the exterior of portable containers for signs of deterioration or leaks;
- Observing tank foundations and supports for signs of instability or excessive settlement;
- Observing the tank fill and discharge pipes for signs of poor connection that could cause a discharge;
- Observing the tank vent for obstructions and proper operation;
- Verifying the proper functioning of overfill prevention systems; and
- Checking the inventory of discharge response equipment and restocking as needed.

Problems associated with tanks, piping, containment, and response equipment are reported immediately to the facility Emergency Coordinator listed in the **General Information Summary**. Visible leaks are repaired as soon as possible to prevent an offsite discharge or a larger spill.

In accordance with STI SP001, if signs of leakage from or deterioration of a steel AST are observed by facility personnel, the tank will be inspected by an STI- or API-certified tank inspector to assess its suitability for continued service.

Completed monthly SPCC inspection records are maintained in **Appendix F** for a minimum of three (3) years.

5.1.2 AST Integrity Testing

ASTs undergo scheduled integrity testing by a certified inspector in accordance with one of the following industry standards, as shown on **Table 1 – Oil and Oil-Based Products Storage Information**:

- Steel Tank Institute (STI) *Standard for the Inspection of Aboveground Storage Tanks SP001*, issued January 2018, 6th Edition (STI SP001); or
- American Petroleum Institute (API) Standard 653 *Tank Inspection, Repair, Alteration, and Reconstruction*, Fifth Edition, November 2014 (API Standard 653).

Visual inspections are sufficient for ASTs with storage capacity of less than 30,000 gallons and that are shop-fabricated to the standards of the American Society for Mechanical Engineers (ASME), API, STI, or Underwriter's Laboratory (UL) and where corrosion poses a minimal risk (i.e., ALL SIDES ARE VISIBLE and the container has no direct contact with the ground).

If an AST does not meet the above criteria, in addition to the visual inspections, it must be tested for integrity using a non-destructive testing (NDT) technique appropriate for the type and size of container in accordance with appropriate guidelines of the American Society for Non-Destructive Testing (ASNT), API, or STI. The test results must be evaluated by an AST Inspector certified to applicable industry or State standards. Unless required more frequently by local or State regulations, testing must be conducted at the frequency specified below and whenever material repairs are made. NDT testing records must be kept for comparison for the lifetime of the AST.

The AST categories are classified as follows:

- Category 1 - ASTs with spill control and a Continuous Release Detection Method (CRDM);
- Category 2 - ASTs with spill control, and without CRDM; and
- Category 3 - ASTs without spill control (note Category 3 ASTs may not meet requirements).

CONTAINER TYPE	SIZE (GALLONS)	CATEGORY 1	CATEGORY 2	CATEGORY 3
Shop-Fabricated Aboveground Storage Tanks	0 – 1,100	P	P	P, E&L(10)
	1,101 - 5,000	P	P, E&L(10)	[P, E&L(5), I(10)] or [P, L(2), E(5)]
	5,001 - 30,000	P, E(20)	[P, E(10), I(20)] or [P, E(5), L(10)]	[P, E&L(5), I(10)] or [P, L(1), E(5)]
	30,001 - 50,000	P, E(20)	P, E&L(5), I(15)	P, E&L(5), I(10)

Table notes:
P – Periodic AST inspection
E – Formal External Inspection by Certified Inspector
I – Formal Internal Inspection by Certified Inspector

L – Leak test by owner or owner's designee
( ) indicates maximum inspection interval in years, e.g., E(5) indicates Formal External Inspection every 5 years.

5.2 Personnel Training

The facility's Primary Facility Contact, listed in the **General Information Summary**, is responsible for discharge prevention, control, and response preparedness activities at the facility and for ensuring training is provided to facility oil-handling personnel.

Oil-handling personnel with job duties directly involving inspection, maintenance, or operation of SPCC-regulated oil storage and transfer equipment are trained on the following subject areas:

- General facility operations (upon hire);
- Oil discharge prevention procedures;
- Relevant environmental and spill prevention regulations; and
- The contents of the SPCC Plan.

Following initial training, oil-handling personnel are briefed at least once a year. Briefings include a review of:

- Oil discharges that occurred during the preceding year;
- Any known malfunctioning facility equipment or components; and
- Recently or newly developed spill prevention measures associated with oil spills.

Additionally, bulletins or notices intended to brief personnel on safety or spill issues are displayed in conspicuous locations around the facility.

Personnel training records are maintained in Halliburton's online electronic training program or on **Form 3 – Oil Spill Prevention Training Log**. Training records are maintained online or with the SPCC Plan in **Appendix G** for a minimum of three years.

5.3 Record Keeping

Completed storm water inspection checklists are maintained in **Appendix E**. Completed Monthly SPCC Inspection records are maintained in **Appendix F**. Copies of training logs are maintained in **Appendix G**. All records will be maintained for a minimum of three (3) years.

6.0 SPILL RESPONSE, CLEANUP AND NOTIFICATION

This section describes the response and cleanup procedures in the event of an oil or oil-based discharge.

6.1 Spill Response and Cleanup

Immediate action will be taken to control, contain, and recover discharged product. In the event of a spill or a release, the general spill response procedures below are implemented.

- **Identify Source** - Locate the source of the release and determine the material released.
- **Turn Off Equipment** - If the release involves operating equipment, turn off the equipment and turn off any other equipment near the source.
- **Stop the Release** - If it is safe, attempt to stop further discharge of material from source using loose absorbents, mats, and/or absorbent pigs from a spill kit.
- **Notify Other Employees** - Notify *Emergency Coordinator* (listed in the **General Information Summary**) of the type and location of the release.
- **Contain the Release** - Use clean up materials and other emergency equipment necessary to contain the release and to control the spilled material from migrating offsite.
- **Contact Emergency Response Contractors** - *Emergency Coordinator* will contact the appropriate spill response and cleanup contractors, as needed.
- **Contain Spill Materials** - Spilled material and debris should be contained, transferred to a labeled storage container and managed in accordance with regulatory requirements.
- **Notify Emergency Personnel** - If necessary, the *Emergency Coordinator* will notify emergency personnel, providing as much information as possible, concerning the release and its hazards.
- **Notify Regulatory Agencies** – As required, the *Emergency Coordinator* will notify regulatory agencies in consultation with Halliburton Global Health, Safety and Environmental (HSE) group.
- **Remove and Dispose of Contaminated Materials** - Soils, absorbent material, and equipment contaminated with spilled material will be disposed of offsite in accordance with regulatory requirements.
- **File Reports** – As required, the *Emergency Coordinator* will file the necessary reports with regulatory agencies in consultation with Halliburton Global HSE.
- **Log Reportable Spills** - The *Emergency Coordinator* will record reportable spills in **Table 2 – Reportable Spill Log**.
- **Restock Equipment** - Once release is cleaned up and appropriate forms completed, the Emergency Coordinator will evaluate spill cleanup equipment inventory and replace materials if needed.

Emergency contacts are posted at prominent locations throughout the facility. Spill response kits and cleanup materials are maintained onsite.

6.2 Disposal of Spilled Material

The steps below will be implemented to dispose of spill-contaminated materials.

- **Contain Used Clean Up Materials** – Designate a separate drum to collect the used clean-up materials as appropriate and label as "Spent Oil Clean Up Materials". Seal the drum lid to prevent spilling of the material onto the ground.

- **Waste Profile Documentation** – Check facility files to verify that a waste profile exists for used clean-up material and assign the appropriate waste code as applicable to the facility.
- **Contact Disposal Company** – Contact a permitted disposal company to schedule a pick up for off-site disposal in accordance with the waste regulations.
- **Review Manifest** – Prior to signing a waste manifest, review the waste manifest to verify the information is correct.
- **Documentation** – Retain manifest documents associated with a release with the facility files.

6.3 Discharge Notification and Reporting

6.3.1 Federal Spill Notification

A discharge of oil that may violate water quality standards, create a film or sheen on the water's surface, or leave an emulsion or sludge beneath the surface, and that impacts or threatens to impact navigable waters or adjoining shorelines will be reported immediately to the National Response Center (NRC) at **1-800-424-8802.**

Halliburton will notify the NRC immediately after identifying a discharge and will provide the following information:

- Name, location, organization, and telephone number;
- Name and address of the party responsible for the incident;
- Date and time of the incident;
- Location of the incident;
- Source and cause of the release or discharge;
- Types of material(s) released or discharged;
- Quantity of materials released or discharged;
- Danger or threat posed by the release or discharge;
- Number and types of injuries (if any);
- Media affected or threatened by the discharge (i.e., water, land, air);
- Weather conditions at the incident location; and
- Any other information that may help emergency personnel respond to the incident.

In addition to the above reporting, the SPCC regulations require that information be submitted to the EPA Regional Administrator and the appropriate state agency whenever the facility has an oil discharge meeting either of the following criteria:

- The facility discharges more than 1,000 gallons of oil into or upon the navigable waters of the U.S. or adjoining shorelines in a single spill event; or
- The facility discharges oil in quantity greater than 42 gallons in each of two spill events within any 12-month period.

In the event of a discharge meeting either of these criteria, submit the following information to EPA Region 8 within 60 days:

- Name of the facility;
- Name of the owner/operator;
- Location of the facility;
- Maximum storage or handling capacity of the facility and normal daily throughput;

- Corrective action and countermeasures taken, including a description of equipment repairs and replacements;
- Description of facility, including maps, flow diagrams, and topographical maps;
- Cause of the discharge(s) to navigable waters and adjoining shorelines, including a failure analysis of the system and subsystem in which the failure occurred;
- Additional preventive measures taken or contemplated to minimize possibility of recurrence; and
- Other pertinent information requested by the Regional Administrator.

6.3.2 Wyoming Spill Notification

The WDEQ Water Quality Division requires that the facility must immediately report to the State a release of a hazardous substance of any amount if it enters or threatens to enter the waters of the State. Any release of oil or an oil-bearing product greater than 25 gallons must also be reported. In addition, a written report must be submitted to the State within 7 days following the release.

6.3.3 Montana Spill Notification

Petroleum releases from ASTs, USTs, or petroleum storage tanks (PSTs) must be reported to the MTDEQ within 24 hours of being detected as required by the Administrative Rules of Montana (ARM) 17.56, Subchapter 5. MTDEQ must be notified of releases of greater than 25 gallons of petroleum from an AST, UST, or PST. Petroleum releases less than 25 gallons in volume must be contained and cleaned up within 24 hours. If cleanup cannot be completed within 24 hours, owners and operators must report the release to MTDEQ. Releases must be reported to a live person - voice mails are not adequate notification.

All other releases and spills should be reported immediately to the state's Disaster and Emergency Services (DES) 24-hour phone number at (406) 324-4777.

The following types of spills must be reported:

- Releases or spills of hazardous substances in amounts that meet or exceed the reportable quantities in 40 CFR Part 302.
- Spills, overfills, and suspected releases from underground storage tanks and petroleum storage tanks. (ARM 17.56, Subchapter 5).
- Releases or spills of any materials that would lower the quality of groundwater below water quality standards. (ARM 17.30.1045).

The following types of spills should be reported:

- Spills that enter or may enter state water or a drainage that leads directly to surface water;
- Spills that cause sludge or emulsion beneath the surface of the water, stream banks, or shorelines;
- Spills that cause a film, "sheen", on the surface of water or that cause a change to the color of the water, stream banks, or shorelines; or
- Spills of twenty-five (25) gallons or more of any petroleum product such as: crude oil, gasoline, diesel fuel, aviation fuel, asphalt, road oil, kerosene, fuel oil; produced water, injection water, salt water, or combination thereof; and derivatives of mineral, animal, or vegetable oils.

6.3.4 South Dakota Spill Notification

A release or spill of a regulated substance (includes petroleum and petroleum products) must be reported to SDDENR immediately if any one of the following conditions exists:

- The discharge threatens or is in a position to threaten the waters of the state (surface water or ground water);
- The discharge causes an immediate danger to human health or safety;
- The discharge exceeds 25 gallons;
- The discharge causes a sheen on surface water;
- The discharge of any substance exceeds the ground water quality standards of Administrative Rules of South Dakota (ARSD) chapter 74:54:01;
- The discharge of any substance exceeds the surface water quality standards of ARSD chapter 74:51:01;
- The discharge of any substance harms or threatens to harm wildlife or aquatic life;
- The discharge of crude oil in field activities under South Dakota Codified Law (SDCL) chapter 45-9 is greater than 1 barrel (42 gallons);
- The discharge is required to be reported according to SARA Title III List of Lists, Consolidated List of Chemicals Subject to Reporting Under the Emergency Planning and Community Right to Know Act, US Environmental Protection Agency.

To report a release or spill, call SDDENR at **605-773-3296** during regular office hours (8 a.m. to 5 p.m. Central time). To report the release after hours, on weekends or holidays, call State Radio Communications at **605-773-3231**. Subsequent to the initial report, the responsible person shall immediately notify SDDENR of information that changes the accuracy of the initial report.

If the release is less than 25 gallons, does not impact surface or groundwater, and is cleaned up within 24 hours the responsible person is not required to report the release.

FIGURES



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COLONY MINE CAMP
554 US HWY 212, BELLE FOURCHE, SD 57717

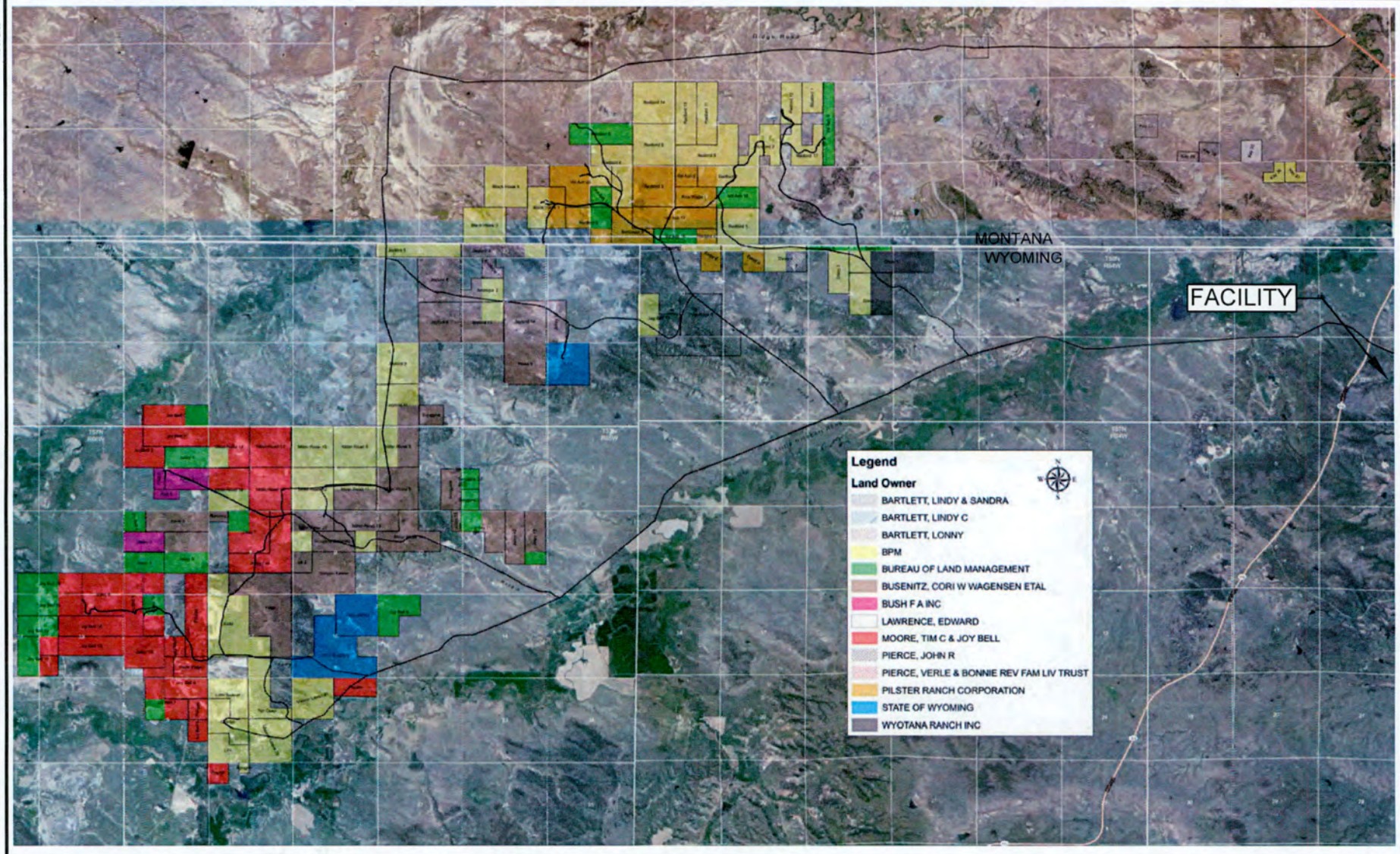
TITLE:
FACILITY LOCATION MAP

DRAWN BY:	NCP
CHECKED BY:	JD
APPROVED BY:	CM
DATE:	OCTOBER 2021
PROJ. NO.:	324438.0000.0000
FILE:	Colony SPCC Figures.dwg

FIGURE 1

8.5x11 -- USER
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DRAWING NAME: C:\Users\npabon\appdata\local\temp\AcPublish_6516\Colony SPCC Figures.dwg -- PLOT DATE: October 13, 2021 - 3:01PM -- LAYOUT: Figure 1
Version: 2017-10-21

8.5x11 — USER: NPabon — ATTACHED XREFS: — ATTACHED IMAGES: Long Haul Aerial, Short Haul Aerial, Wyoming
DRAWING NAME: C:\Users\npabon\appdata\local\temp\AcPublish_6516\ Colony SPCC Figures.dwg --- PLOT DATE: October 13, 2021 - 3:03PM --- LAYOUT: Figure 2a



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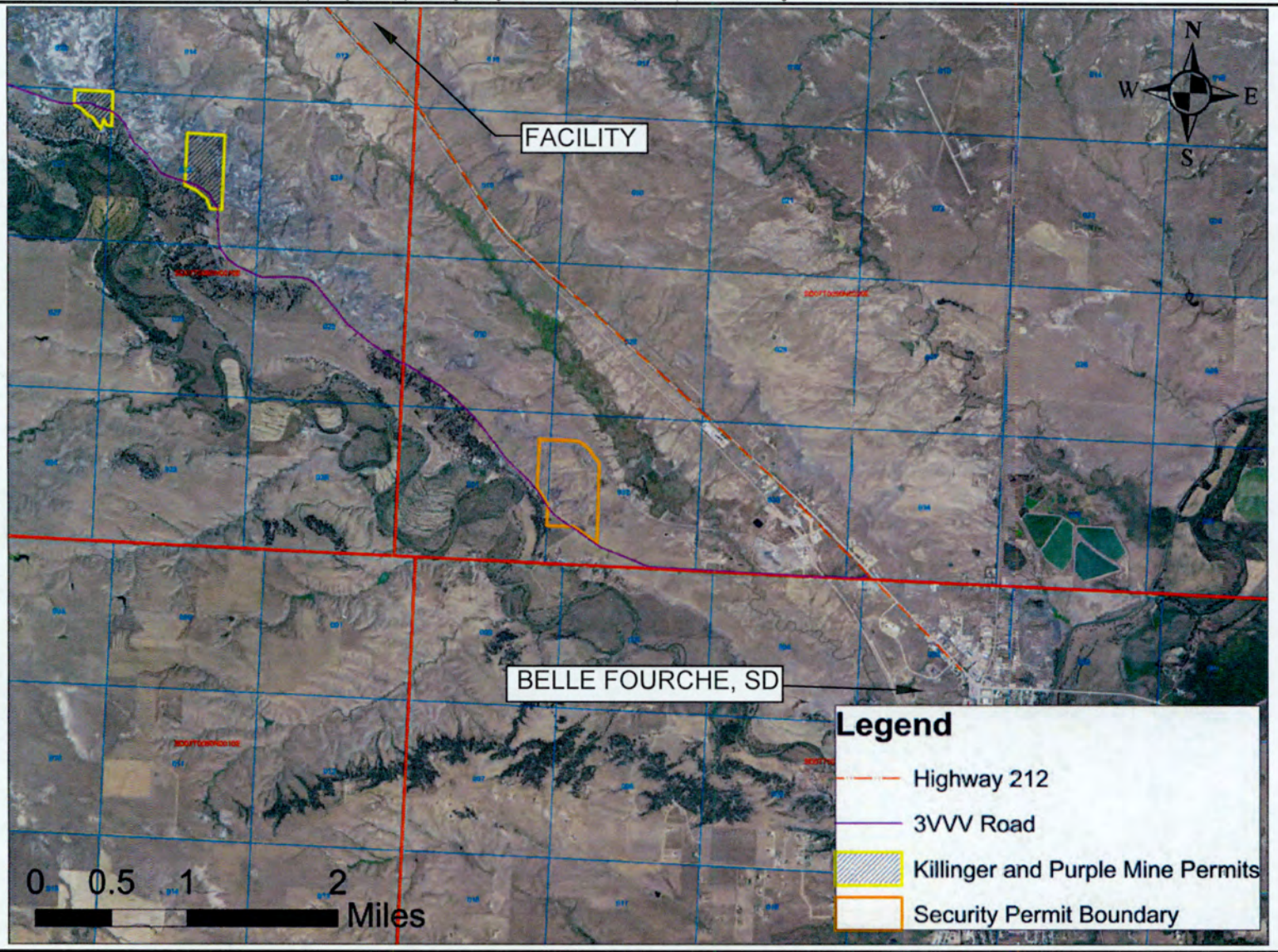
TITLE:

LONG HAUL OPERATIONS LOCATION MAP (WY, MT)

DRAWN BY:	NCP
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APPROVED BY:	CM
DATE:	OCTOBER 2021
PROJ. NO.:	324438.0000.0000
FILE:	Colony SPCC Figures.dwg

FIGURE 2a

8.5x11 — USER 'ACHED XREF'S — ATTACHED IMAGES: Long Haul Aerial, Short Haul Aerial, Wyoming
DRAWING NAME: L:\Remediation\HALLIBURTON\REGULAR PROJECTS\Colony SPCC Update\Figures\ Colony SPCC Figures.dwg — PLOT DATE: October 13, 2021 - 3:32PM — LAYOUT: Figure 2b



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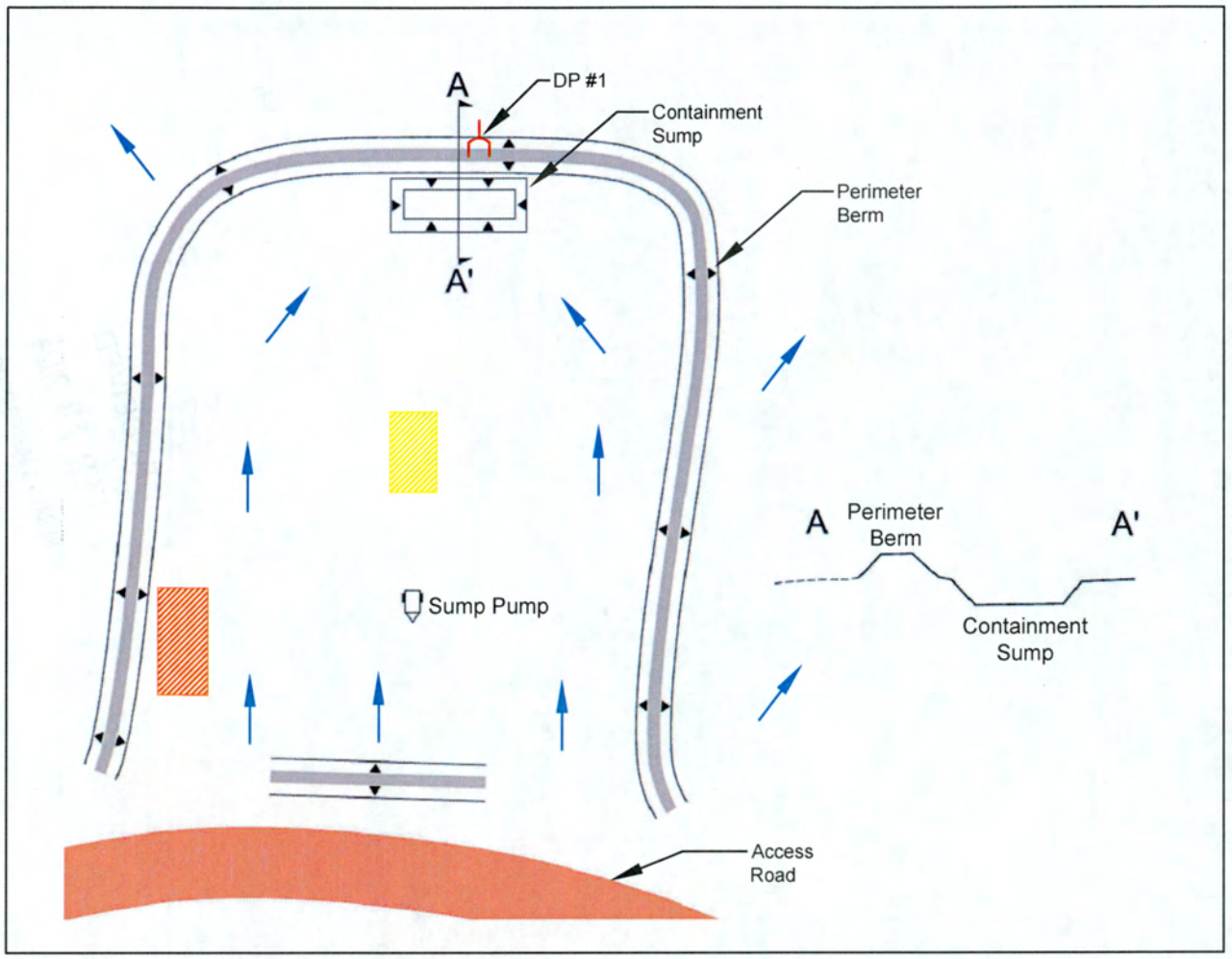
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TITLE:
LONG HAUL OPERATIONS LOCATION MAP (SD)

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FIGURE 2b



Legend

- Surface Flow Direction
- Discharge Point
- Oil and Oil Based Product Drum Storage
- Mobile Refuelers/ Vehicle Staging Area

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TITLE:
TYPICAL CAMP LAYOUT

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DATE:	OCTOBER 2021
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FIGURE 3

8.5x11 -- USER: NPabon -- ATTACHED XREFS: -- ATTACHED IMAGES: Long Haul Aerial Short Haul Aerial Wyoming
DRAWING NAME: C:\Users\npabon\appdata\local\temp\AcPublish_26040\ Colony SPCC Figures.dwg -- PLOT DATE: November 10, 2021 - 5:34PM -- LAYOUT: Figure 3
Version: 2017-10-21

8.5x11 --- USER: TACHED XREFS: --- ATTACHED IMAGES: Long Haul Aerial, Short Haul Aerial, Wyoming
DRAWING NAME: C:\Users\npabon\appdata\local\temp\AcPublish_6516\ Colony SPCC Figures.dwg ---PLOT DATE: October 13, 2021 - 3:34PM --- LAYOUT: Figure 4
Version 2017.0.0

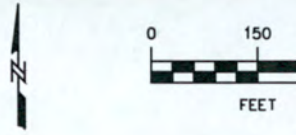


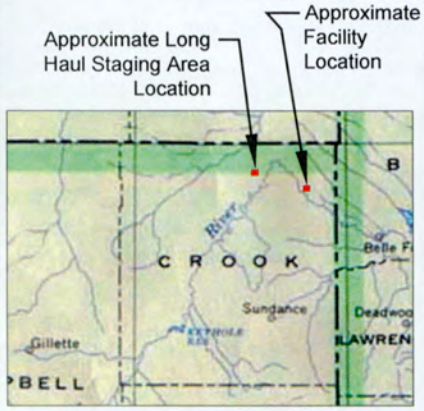
Legend

- Surface Flow Direction
- Earthen Berm
- SPCC Regulated Tank
- Spill Kit
- Mobile Refuelers Staging Area
- Oil and Oil Based Product Drum Storage

Note

Refer to Table 1 for contents and capacities of oil storage containers.





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TITLE:

LONG HAUL STAGING AREA CONTAINMENT DIAGRAM

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FIGURE 4

8.5x11 --- USER: NPabon --- ATTACHED XREFS: --- ATTACHED IMAGES: Long Haul Aerial; Short Haul Aerial; Wyoming;
DRAWING NAME: C:\Users\npabon\appdata\local\temp\AcPublish_6516\ Colony SPCC Figures.dwg --- PLOT DATE: October 13, 2021 - 3:35PM --- LAYOUT: Figure 5



Legend

- Surface Flow Direction
- SPCC Regulated Tank
- Spill Kit (KIT)
- Earthen Berm

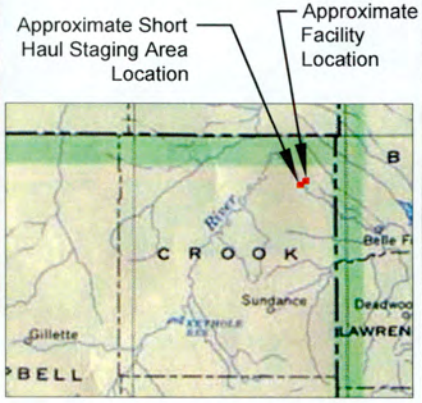
Note

Refer to Table 1 for contents and capacities of oil storage containers.

N

0 100 200

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TITLE:

SHORT HAUL STAGING AREA CONTAINMENT DIAGRAM

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APPROVED BY:	CM
DATE:	OCTOBER 2021
PROJ. NO.:	324438.0000.0000
FILE:	Colony SPCC Figures.dwg

FIGURE 5

TABLES

CONTAINER ID	TYPE OF CONTAINER[1]	STORAGE CAPACITY (GALLONS)	CONTENTS	LOCATION	MATERIAL OF CONSTRUCTION	STATIONARY OR PORTABLE	OVERFILL PROTECTION[2]	LEAK DETECTION[3]	SECONDARY CONTAINMENT DESCRIPTION[4]	SECONDARY CONTAINMENT CAPACITY (GALLONS)	PIPING[5]	STI SP001 INSPECTION REQUIREMENT[6]	COMMENTS[7]
UO-1 – UO-3	Tank Truck	250 per tank	Used Oil	Camp Area/Long Haul Area	Steel	Portable	VO	VS	DW/IC, BDS or BDL	See Note 9	Not Applicable	MV, AV	Spill kit located on mobile refueler trucks
Drum Storage	Drum	0 - 440	Varies	Camp Area/Long Haul Area	Steel	Portable	VO	VS	BDS or BDL	See Note 9	Not Applicable	MV, AV	Spill kit located on mobile refueler trucks
Generator	Equipment	100	Diesel	Camp Area/Long Haul Area	Steel	Portable	VO	VS	BDS or BDL	See Note 9	Not Applicable	MV, AV	Spill kit located on mobile refueler trucks
AST-1 – AST-5[8]	Tank Truck	100 per tank	Diesel	Camp Area/Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located on mobile refueler trucks
AST-6 – AST-7[8]	Tank Truck	75 per tank	Diesel	Camp Area/Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located on mobile refueler trucks
AST-8[8]	Tank Truck	75	Gasoline	Camp Area/Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located on mobile refueler trucks
Kenworth Mobile Fuel Truck	Tank Truck	1,000	Diesel	Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located in Long Haul Area
Kenworth Mobile Fuel Truck	Tank Truck	120	Used Oil	Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located in Long Haul Area
Kenworth Mobile Fuel Truck	Tank Truck	120	Oil	Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located in Long Haul Area
Kenworth Mobile Fuel Truck (3)	Tank Truck	60 per tank	Oil	Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located in Long Haul Area
LH-1	Tank	1,000	Diesel	Camp Area/Long Haul Area	Steel	Portable	VO	VS	BDS	See Note 9, 10	Not Applicable	MV, AV	Spill kit located in Long Haul Area
LH-2	Tank	2,000	Diesel	Long Haul Area	Steel	Stationary	VO	VS	BDL	50,850	Not Applicable	MV, AV	Spill kit located in Long Haul Area
LH-3	Tank Truck	5,700	Diesel	Long Haul Area	Steel	Stationary	VO	VS	BDL	50,850	Not Applicable	MV, AV, I20 (08/39)	Spill kit located in Long Haul Area
LH-4	Tank Truck	9,200	Diesel	Long Haul Area	Steel	Stationary	VO	VS	BDL	50,850	Not Applicable	MV, AV, I20 (08/39)	Spill kit located in Long Haul Area

CONTAINER ID	TYPE OF CONTAINER[1]	STORAGE CAPACITY (GALLONS)	CONTENTS	LOCATION	MATERIAL OF CONSTRUCTION	STATIONARY OR PORTABLE	OVERFILL PROTECTION[2]	LEAK DETECTION[3]	SECONDARY CONTAINMENT DESCRIPTION[4]	SECONDARY CONTAINMENT CAPACITY (GALLONS)	PIPING[5]	STI SP001 INSPECTION REQUIREMENT[6]	COMMENTS[7]
LH-5	Tank	12,000	Diesel	Long Haul Area	Steel	Stationary	HLA	LLA	DW/IC, BDL	50,850	Not Applicable	MV, AV, I20 (10/40)	Spill kit located in Long Haul Area
SH-1	Tank	1,000	Diesel	Short Haul Area	Steel	Stationary	VO	VS	BDS	426,900	Not Applicable	MV, AV	Spill kit located in Short Haul Area
SH-2	Tank	2,000	Diesel	Short Haul Area	Steel	Stationary	VO	VS	BDS	426,900	Not Applicable	MV, AV	Spill kit located in Short Haul Area
SH-3	Tank	12,000	Diesel	Short Haul Area	Steel	Stationary	HLA	LLA	DW/IC	Not Applicable	Not Applicable	MV, AV, I20 (10/40)	Spill kit located in Short Haul Area

Table notes:

1 - Type of Container
Tank – Aboveground Storage Tank
Tote – 275-gallon, 330-gallon and 550-gallon totes
Drum – 55-gallon drums
Equipment – Oil-Filled Operational or Manufacturing Equipment
Tank Truck – Vehicle
OWS – Oil-Water Separator

2 - Overfill Protection
AFNSO – Automatic fuel-nozzle shut off
ESD – Emergency shut-down (e.g., high-level shut-down)
HLA – High-level alarm
LI – Level indicator (e.g., sight gauge)
VO – Visual observation

3 - Leak Detection
ESD – Emergency shut-down (e.g., low-level shut down)
LLA – Low-level alarm
VS – Visual surveillance

4 - Secondary Containment Description
BD – Berm or dike
BDL – Berm or dike with liner
BDS – Berm or dike with sump
BF – Building floor
BF/C – Building floor/curb
BF/S – Building floor/sump
CP/C – Concrete pad/curb
DW/IC – Double walled/integral containment
MC – Metal containment
Note: Secondary containment capacity calculations are in Appendix D.

5 - Piping
Aboveground
Underground
Both

6 – STI SP001 Inspection Requirement
MV – Monthly visual inspection
AV – Annual visual inspection
I20 (MM/YY) – Integrity inspection by a certified inspector every 20 years (due date of next inspection)

7 - Comments
Include location of spill kit

8 – Containers are mounted on various F-150 – F-350 trucks.

9 – Tanks are stationed at new camp areas every 4-6 months. Secondary Containment is constructed to meet or exceed 110% of the largest tank volume within the containment.

10 – Mobile refuelers are exempt from sized secondary containment requirements, however, general secondary containment is provided.

DATE	SPILL DESCRIPTION	SPILL LOCATION	SPILL CLEAN UP	AGENCIES NOTIFIED
12 Months Prior to SPCC Plan Development				
Post-SPCC Plan Development				

POTENTIAL EVENT	MAXIMUM VOLUME RELEASED (GALLONS)	MAXIMUM DISCHARGE RATE (GALLONS PER MINUTE)	DIRECTION OF FLOW	SECONDARY CONTAINMENT
Release from UO-1 – UO-3	250	Gradual up to 250 gpm	Varies with each Camp Area	Earthen berm with sump, double walled tanks
Release from Drum Storage	55	Gradual up to 440 gpm	Varies with each Camp Area	Earthen berm with sump
Release from Generator	100	Gradual up to 100 gpm	Varies with each Camp Area	Earthen berm with sump
Release from AST-1 – AST-5	100	Gradual up to 100 gpm	Varies with each Camp Area	Earthen berm with sump
Release from AST-6 – AST-8	75	Gradual up to 75 gpm	Varies with each Camp Area	Earthen berm with sump
Release from tanks on Kenworth Mobile Fuel Truck	1,000	Gradual up to 1,000 gpm	Southeast, Southwest	Earthen berm with sump
Release from LH-1	1,000	Gradual up to 1,000 gpm	Southeast, Southwest	Earthen berm with sump
Release from LH-2	2,000	Gradual up to 2,000 gpm	Southeast, Southwest	Earthen berm with liner
Release from LH-3	5,700	Gradual up to 5,700 gpm	Southeast, Southwest	Earthen berm with liner
Release from LH-4	9,200	Gradual up to 9,200 gpm	Southeast, Southwest	Earthen berm with liner

POTENTIAL EVENT	MAXIMUM VOLUME RELEASED (GALLONS)	MAXIMUM DISCHARGE RATE (GALLONS PER MINUTE)	DIRECTION OF FLOW	SECONDARY CONTAINMENT
Release from LH-5	12,000	Gradual up to 12,000 gpm	Southeast, Southwest	Earthen berm with liner, double walled tank
Release from SH-1	1,000	Gradual up to 1,000 gpm	Southeast, Southwest	Earthen berm with sump
Release from SH-2	2,000	Gradual up to 2,000 gpm	Southeast, Southwest	Earthen berm with sump
Release from SH-3	12,000	Gradual up to 12,000 gpm	Southeast, Southwest	Double walled tank

PROCEDURES

The steps listed below are general actions that should be implemented while loading/unloading or conducting liquid transfers of fuel, oil or other oil-based products to or from tanks and containers. Contact the Primary Facility Contact or the Emergency Coordinator (listed in the **General Information Summary**) for additional guidance.

Before a fluid transfer begins, the "Receiver" and "Off-Loader" must communicate face-to-face or via radio. Radio is acceptable for routine/regular transfers while a face-to-face meeting is required for unusual or uncommon transfers. The Halliburton Lead, who may also be the Receiver or Off-Loader, is responsible for initiating this discussion and addressing the responsibilities of each participant.

The Halliburton Lead will:

- ✓ Identify and evaluate hazards posed by other activities in the immediate area and determine if the fluid transfer can be performed safely.
- ✓ Ensure all participants know the emergency shut-off procedures and how to stop a transfer in case of an alarm.
- ✓ Ensure the Off-Loader, particularly if they are a third-party vendor, knows the correct tank/container and connection location.

The Receiver will:

- ✓ Confirm the receiving tank/container has adequate capacity to receive the fluid.
- ✓ Confirm the fluid volume brought/available from Off-Loader.
- ✓ Verify the Off-Loader is transferring the correct fluid to the correct tank.
- ✓ Ensure spill response materials (sorbents, shovels, bags, etc.) are readily available.

The Off-Loader will:

- ✓ Confirm the receiving tank/container has adequate capacity to receive the fluid and verify the volume of fluid to be transferred.
- ✓ Verify the fluid is compatible with tank.
- ✓ Place liners at inlet and outlet points, hose/pipe joints, and other critical transfer components that are outside of containment.
- ✓ Ensure valves in the transfer system are in the correct position.
- ✓ Inspect valves, piping and hoses for damage, defects, and leaks.
- ✓ Check that manifolds and valves not in use are blind-flanged or capped.
- ✓ Ensure the transfer equipment (e.g. hoses) is rated for the transfer pressure.
- ✓ Confirm grounding straps are connected.
- ✓ Verify the lowermost drain and outlets of the truck are not leaking.

FORMS

INSTRUCTIONS

Inspect storm water that accumulates inside the secondary containment area for the presence of oil or sheen and other parameters using this checklist.

- If oil or sheen is present, collect and dispose of the impacted storm water in accordance with regulations using a Halliburton-approved waste vendor.
- If no oil or sheen is present, storm water may be discharged under the facility's supervision or left to evaporate.

To complete the Checklist:

1. Record the facility name and address, the date and time of the the inspection, the type of containment (e.g., lined dike, concrete curb), and the name of the storage area.
2. Enter your name (Inspector) and signature.
3. Observe the accumulated storm water and record indicators and comments as necessary.
4. Maintain inspection records onsite in **Appendix E** of the SPCC Plan for at least three (3) years.

Facility Name:	**Facility Address:**
Inspection Date:	**Inspection Time:**
Type of Containment:	**Storage Area:**
Inspector Name:	**Inspector Signature:**

INDICATOR	OBSERVED		COMMENTS
	YES	NO	
Oil Product			
Sheen			
Color			
Odor			
Solids			
Foam			
Other:			

Was the storm water discharged? ☐ **Yes** ☐ **No** **If yes, approximate amount discharged (gallons):** _____

If yes, discharge location and path: _____

If no, describe disposal method: _____

INSTRUCTIONS

At least once a month, visually inspect bulk storage containers (aboveground storage tanks, totes, drums), associated piping, oil-filled equipment and secondary containments using this checklist. Retain completed checklists for at least three (3) years in Appendix F of the Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Notes:

- See **Table 1** (Oil and Oil-Based Products Storage Information) of the SPCC Plan for a list of equipment to be inspected.
- Multiple bulk storage container inspections may be captured on one form as long as the containers are substantially the same.
- The visual inspection is intended to monitor the external condition of the equipment and its containment, and does not require a Certified Inspector. The inspection shall be performed by qualified facility personnel.
- Non-conforming items important to aboveground storage tank integrity require evaluation by an engineer experienced in tank design, a Certified Inspector, or a tank manufacturer who will determine the corrective action. Note the non-conformance and corresponding corrective action(s) in the comment section.
- After severe weather (snow, ice, wind storms) or maintenance (such as coating) that could affect the operation of critical components (normal and emergency vents, valves), an inspection of these components is required as soon as the equipment is safely accessible after the event.

INSPECTION DATE (MM/YYYY):	INSPECTOR NAME/TITLE:

ABOVEGROUND STORAGE TANKS (includes stationary/fixed field-constructed and shop-built steel/poly/other tanks):

#	INSPECTION ITEM	TANK ID AND STATUS						COMMENTS/ DATE CORRECTED
		LH-3	LH-4	LH-5	SH-3			
	TANKS AND PIPING							
1	Is tank exterior (roof, shell, heads, bottom, connections, fittings, valves, etc.) free of visible leaks? *If "No", identify tank and describe leak and actions taken.*	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
2	Is the tank liquid level gauge legible and in good working condition?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
3	Is the area around the tank (concrete surfaces, ground, containment, etc.) free of visible signs of leakage?	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	

#	INSPECTION ITEM	TANK ID AND STATUS						COMMENTS/ DATE CORRECTED
		LH-3	LH-4	LH-5	SH-3			
4	Is the primary tank free of accumulated water?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
5	For double-wall, double-bottom or concrete-exterior tanks, is interstitial monitoring equipment (where applicable) in good working condition?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
6	For double-wall, double-bottom or concrete-exterior tanks, is interstice free of liquid? *If found, remove liquid and check for possible leak if the liquid is product.*	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
	EQUIPMENT ON TANK							
7	If overfill equipment has a "test" button, does it activate the audible horn or light to confirm operation? *If battery operated, replace battery if needed.*	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
8	Is overfill prevention equipment in good working condition? *If it is equipped with a mechanical test mechanism, actuate the mechanism to confirm operation.*	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
9	Is the spill container (spill bucket) empty, free of visible leaks and in good working condition?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
10	Are piping connections to the tank (valves, fittings, pumps, etc.) free of visible leaks? *If "No", identify location and describe leak.*	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
11	Do the ladders/platforms/walkways appear to be secure with no sign of severe corrosion or damage?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	

#	INSPECTION ITEM	TANK ID AND STATUS						COMMENTS/ DATE CORRECTED
		LH-3	LH-4	LH-5	SH-3			
	CONTAINMENT (DIKING/IMPOUNDING)							
12	Is the containment free of excess liquid, debris, cracks, corrosion, erosion, fire hazards and other integrity issues? *Upon discovery of liquids, inspect the fluids, check for leaks (as applicable), and dispose of liquids properly.*	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
13	Are dike drain valves closed and in good working condition?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
14	Are containment egress pathways clear and any gates/doors operable?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
	CONCRETE EXTERIOR AST (CE-AST)							
15	Inspect all sides for cracks in concrete. Are there any cracks in the concrete exterior larger than 1/16"?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
16	Inspect concrete exterior body of the tank for cleanliness, need of coating, or rusting where applicable. Tank exterior in acceptable condition?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
17	Inspect all tank top openings including nipples, manways, overfill containers, and leak detection tubes. Is the sealant between all tank top openings and concrete intact and in good condition?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
	OTHER CONDITIONS							
18	Is the system free of any other conditions that need to be addressed for continued safe operation?	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	

PORTABLE / MOBILE CONTAINERS (includes tanks, totes, drums, mobile refuelers and auxiliary fuel tanks on vehicles):

#	INSPECTION ITEM	STORAGE AREA LOCATION AND STATUS					COMMENTS/ DATE CORRECTED
		LONG HAUL CAMP AREA	SHORT HAUL CAMP AREA	LONG HAUL AREA	SHORT HAUL AREA	KENWORTH FUEL TRUCK	
1	Are all portable container(s) within designated storage area?	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
2	Is the storage area containment free of excess liquid, debris, cracks or fire hazards?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
3	Are containment drain valves closed and in good working condition?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
4	Are storage area egress pathways clear and any gates/doors operable?	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
5	Are containers labeled with their contents and an indication of content hazards?	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
6	Are containers free of leaks? *If "No", identify container and describe leak and actions taken.*	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
7	Are containers free of distortions, buckling, denting or bulging?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
8	Are 55-gallon metal drums stacked no more than four high on a level and paved surface?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	

#	INSPECTION ITEM	STORAGE AREA LOCATION AND STATUS					COMMENTS/ DATE CORRECTED
		LONG HAUL CAMP AREA	SHORT HAUL CAMP AREA	LONG HAUL AREA	SHORT HAUL AREA	KENWORTH FUEL TRUCK	
9	Are 275-gallon and 330-gallon totes stacked no more than three high on a level and paved surface or no more than two high on a level but unpaved suface?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	
10	Are containers holding incompatible materials separated by at least five (5) feet?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	

OIL-FILLED EQUIPMENT (includes transformers, generators, circuit breakers, lube/hydraulic/seal oil reservoirs and accumulators):

#	INSPECTION ITEM	STORAGE AREA LOCATION AND STATUS					COMMENTS/ DATE CORRECTED
		LONG HAUL CAMP AREA	SHORT HAUL CAMP AREA	LONG HAUL AREA	SHORT HAUL AREA		
1	Is the oil-filled equipment free of leaks? *If "No", identify equipment and describe leak and corrective action.*	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
2	Is the equipment free of distortions, buckling, denting or bulging?	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
3	Is the equipment provided with containment? *Note: Onsite spill kits are acceptable forms of 'active' containment for oil-filled equipment.*	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	□ Yes □ No	
4	Is the containment free of excess liquid, debris, cracks or fire hazards?	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	□ Yes □ No □ N/A	

INSPECTOR SIGNATURE: _____

Training Scope:

Oil-handling personnel with job duties directly involved with the inspection, maintenance or operation of oil storage and transfer equipment are trained on the following subject areas:

- General facility operations (upon hire);
- Oil discharge prevention procedures;
- Relevant environmental and spill prevention regulations; and
- The contents of the facility's Spill Prevention, Control, and Countermeasure (SPCC) Plan.

Training Date: _____

Type of Training: _____

Instructor: _____

PRINT NAME	TITLE	SIGNATURE

Note: Include an agenda or copy of training presentation with this training log for recordkeeping purposes. Maintain completed training logs in **Appendix G** of the SPCC.

APPENDICES

CERTIFIED STATEMENTS OF SPCC PLAN REVIEW AND EVALUATION

APPENDIX A

SPCC PLAN REVIEW AND EVALUATION CERTIFICATION

Halliburton Energy Services, Inc.

Bentonite Performance Minerals LLC

554 US Hwy 212

Belle Fourche, SD 57717

I have completed the review and evaluation of the SPCC Plan for the Halliburton Energy Services, Inc. facility located at 554 US Hwy 212, Belle Fourche, SD and will/will not (circle one) amend the SPCC Plan as a result.

Name:_____ Signature:_____

Title: _____ Date: _____

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA

APPENDIX B

CERTIFICATION OF THE APPLICABILITY OF THE SUBSTANTIAL HARM CRITERIA

Halliburton Energy Services, Inc.

Bentonite Performance Minerals LLC

554 US Hwy 212

Belle Fourche, SD 57717

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes: _____ No: X

2. Does the facility have a total storage capacity of greater than or equal to one million gallons, and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tanks plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?

Yes: _____ No: X

3. Does the facility have a total oil storage capacity greater than or equal to one million gallons and is the facility located at a distance such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

Yes: _____ No: X

4. Does the facility have a total oil storage capacity greater than or equal to one million gallons and is the facility located at a distance such that a discharge from the facility would shut down a public drinking water intake?

Yes: _____ No: X

5. Does the facility have a total oil storage capacity greater than or equal to one million gallons and has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last 5 years?

Yes: _____ No: X

CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Name: Tyler Tetrault Title: Mine Manager

Signature: Date: 11/23/21

HALLIBURTON

IMPLEMENTATION SCHEDULE

APPENDIX C

IMPLEMENTATION SCHEDULE

Halliburton Energy Services, Inc.

Bentonite Performance Minerals LLC

554 US Hwy 212

Belle Fourche, SD 57717

The P.E. has certified this SPCC Plan under the following conditions:

- Halliburton has agreed to the modification(s) to procedures and/or equipment at the facility,
- Halliburton has budgeted the necessary funds and allocated the manpower and equipment,
- The facility shall implement the modification(s) no later than six months, and
- The facility shall record the date(s) the modification(s) when implemented.

REGULATORY REQUIREMENT	ACTION	TARGET DATE	DATE IMPLEMENTED	COMMENTS

SECONDARY CONTAINMENT CALCULATIONS

APPENDIX D

COMPLETED STORM WATER INSPECTION CHECKLISTS

APPENDIX E

SECONDARY CONTAINMENT CALCULATIONS

Halliburton Energy Services, Inc.
Bentonite Performance Minerals LLC
554 US HWY 212, Belle Fourche, SD

Long Haul Area	
Containment Type:	Earthen Berm with Liner
Containment Area (sq. ft):	4,320
Containment Height (ft):	2.0
Total Containment Volume (gals):	64,636

Displacement Volumes							
Displacement Description	*Diameter (ft)*	*Length (ft)*	*Width (ft)*	*Height (ft)*	*Displaced Height (height below containment wall) (ft)*	*Quantity*	*Displaced Volume (gals)*
LH-2[1]	6	9.5	---	---	2	1	586
LH-3[1, 2]	5	40	---	---	N/A	1	N/A
LH-4[1, 2]	5	60	---	---	N/A	1	N/A
LH-5[1, 3]	6	57	---	---	N/A	1	N/A

1 - Dimensions estimated from container volume.

2 - Tanks are elevated and do not contribute to displacement volume.

3 - Largest tank within berm does not contribute to displacement volume.

Largest Tank In Containment	
LH-5	12,000
110% of LH-5 Volume	13,200

SUMMARY - 110% Largest Tank Containment	
Total Containment Volume (gals) (**1**)	64,636
Total Displacement Volume (gals) (**2**)	586
110% of Largest Tank Volume (gals) (**3**)	13,200
Excess/Deficiency Containment (gals) = (1-2-3)	**50,850**

SECONDARY CONTAINMENT CALCULATIONS

Halliburton Energy Services, Inc.
Bentonite Performance Minerals LLC
554 US HWY 212, Belle Fourche, SD

Short Haul Area	
Containment Type:	Earthen Berm with Sump
Containment Area (sq. ft):	28,700
Containment Height (ft):	2.0
Total Containment Volume (gals):	429,409

Displacement Volumes							
Displacement Description	*Diameter (ft)*	*Length (ft)*	*Width (ft)*	*Height (ft)*	*Displaced Height (height below containment wall) (ft)*	*Quantity*	*Displaced Volume (gals)*
SH-1[1]	6	5	---	---	2.0	1	309
SH-2[1, 2]	6	9.5	---	---	N/A	1	N/A

1 - Dimensions estimated from container volume.

2 - Largest tank within berm does not contribute to displacement volume.

Largest Tank In Containment	
SH-2	2,000
110% of SH-2 Volume	2,200

SUMMARY - 110% Largest Tank Containment	
Total Containment Volume (gals) (**1**)	429,409
Total Displacement Volume (gals) (**2**)	309
110% of Largest Tank Volume (gals) (**3**)	2,200
Excess/Deficiency Containment (gals) = (1-2-3)	**426,901**

COMPLETED MONTHLY SPCC INSPECTION CHECKLISTS

APPENDIX F

COMPLETED
OIL SPILL PREVENTION
TRAINING RECORDS

APPENDIX G

Appendix C

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MINERALS & MINING PROGRAM

Appendix C

BPM Security Bentonite Mine

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Notice of Determination of Special, Exceptional, Critical, or Unique Lands

BPM Security Bentonite Mine

DEPARTMENT of AGRICULTURE and NATURAL RESOURCES
JOE FOSS BUILDING
523 E CAPITOL AVE
PIERRE SD 57501-3182
danr.sd.gov

NOTICE OF DETERMINATION OF SPECIAL, EXCEPTIONAL, CRITICAL, OR UNIQUE LANDS BENTONITE PERFORMANCE MINERALS, LLC

The Department of Agriculture and Natural Resources has made its determination regarding a Notice of Intent to Operate and Request for Determination of Special, Exceptional, Critical, or Unique Lands from Bentonite Performance Minerals, LLC, 554 US Highway 212, Belle Fourche, South Dakota 57717. The Notice of Intent to Operate was submitted as required under ARSD 74:29:10 for purposes of requesting the department to determine whether the lands potentially affected by the mining operation are eligible for inclusion on the preliminary list of special, exceptional, critical, or unique lands.

The proposed operation involves mining for bentonite on land approximately two miles northwest of Belle Fourche, South Dakota. Bentonite Performance Minerals, LLC will affect approximately 128.4 acres during the life of the Security Mine. Several pits will be mined using cast back mining techniques. Topsoil, subsoil, and overburden will be stripped and stockpiled or used to backfill and topsoil previously mined pits. Bentonite will be hauled from each pit along existing haul roads to Bentonite Performance Minerals, LLC's processing plant in Colony, Wyoming. Reclamation will be conducted concurrently with the mining operation. The land will be reclaimed to its present use of rangeland.

In accordance with ARSD 74:29:10:08 and 74:29:10:09, the department has determined that the lands described in the Notice of Intent to Operate do not constitute special, exceptional, critical, or unique lands. This determination is based on the on-site inspection of the proposed lands to be affected, examination of the established preliminary list, consultation with other agencies, and evaluating information provided with the Notice of Intent to Operate. In addition, no nominating petitions pertaining to the lands described in the Notice of Intent were filed with the department.

The lands described in the Notice of Intent to Operate are considered cleared from special, exceptional, critical, or unique characteristics in accordance with ARSD 74:29:10:15. This clearance will remain in effect for seven years. If a mine permit application is not submitted within the seven-year period, the Board of Minerals and Environment may declare the clearance void and the lands may be reevaluated.

Bentonite Performance Minerals, LLC may appeal the department's determination by filing a petition for a contested case hearing pursuant to SDCL 1:26 within seven days after receipt of the determination. The hearing on the appeal shall be confined to the determination of the lands as special exceptional, critical, or unique and whether an environmental impact statement and socioeconomic study will be required.

Persons desiring further information may contact Eric Holm, Minerals and Mining Program, at (605) 773-4201.

Hunter Roberts
Secretary
Department of Agriculture and Natural Resources

February 15, 2022

Department of Agriculture and Natural Resources
Minerals and Mining Program
523 East Capitol Avenue
Pierre, South Dakota 57501-3182
605 773-4201; Fax: 605 773-5286

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REQUEST FOR DETERMINATION OF SPECIAL, EXCEPTIONAL, CRITICAL, OR UNIQUE LANDS AND NOTICE OF INTENT TO OPERATE

Pursuant to SDCL 45-6B and ARSD 74:29:10

Operator's name: Bentonite Performance Minerals, LLC

Mailing address: 554 US HWY 212
Belle Fourche, SD 57717

Telephone: 307.896.2596

Local address: 554 US HWY 212
Belle Fourche, SD 57717

Telephone: 307.896.6060

Legal description:

Township 9 North, Range 2 East
Section 31: SE4SE4NE4NE4, E2E2SE4NE4 and that portion of the E2E2NE4SE4 north of 3 View Road.
Section 32: SW4NW4, NW4SW4, W2W2NE4SW4 those portions of the S2S2NW4NW4, SW4NE4NW4 & W2W2SE4NW4 south of the ACC Haul Road and those portion of the W2W2SE4SW4 & NE4SW4SW4 north of 3 View Road.

County:
Butte

Name and address of surface owner:
David Garman
PO Box 207
Belle Fourche, SD 57717

Name and address of mineral owner:
Bentonite Performance Minerals, LLC
554 US HWY 212
Belle Fourche, SD 57717

Name and address of surface owners within 500 feet of the proposed mining operation:

Dave Garman	PO Box 207	Belle Fourche	South Dakota	57717
Dave & Wendy Garman	PO Box 207	Belle Fourche	South Dakota	57717
Pioneer Townsite Company, C/O American Colloid Company	PO Box 2010	Belle Fourche	South Dakota	57717
Harvey A. Garr	10737 3V Road	Belle Fourche	South Dakota	57717

I declare and affirm under the penalties of perjury that this claim (petition, application, information) has been examined by me, and to the best of my knowledge and belief, is in all things true and correct.

Tyler Tetrault
Tyler Tetrault (Nov 30, 2021 08:16 MST)
Signature

Date: 11/30/2021

Title: Mine Manager

FOR DEPARTMENT USE ONLY

The land described in this Request for Determination of Special, Exceptional, Critical, or Unique Lands and Notice of Intent to Operate _____ is _X_ is not eligible for inclusion on the list of special, exceptional, critical, or unique lands.

_____ Date: February 15, 2022

Secretary, Department of Agriculture and Natural Resources

Operator appeal date: February 22, 2022 Intervenor contest date: _____

The land described in this Request for Determination of Special, Exceptional, Critical, or Unique Lands and Notice of Intent to Operate _____ is _____ is not eligible for inclusion on the list of special, exceptional, critical, or unique lands.

_____ Date: _____

Chairman, SD Board of Minerals and Environment

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Baseline Hydrologic Report

BPM Security Bentonite Mine

Baseline Hydrology Survey Results for Proposed Security Project, Butte County, South Dakota

OCTOBER 2021

PREPARED FOR

Bentonite Performance Minerals, LLC

SUBMITTED TO

South Dakota Department of Agriculture and Natural Resources

PREPARED BY

SWCA Environmental Consultants

BASELINE HYDROLOGY SAMPLING RESULTS FOR PROPOSED SECURITY PROJECT, BUTTE COUNTY, SOUTH DAKOTA

Prepared for

Bentonite Performance Minerals, LLC
Belle Fourche, South Dakota 57717

Submitted to

South Dakota Department of Agriculture and Natural Resources
523 E. Capitol Ave.
Pierre, South Dakota 57501
(605) 773-4201

Prepared by

Christine Varah
Project Manager

Randy Herman
Environmental Specialist

SWCA Environmental Consultants
1892 South Sheridan Avenue
Sheridan, Wyoming 82801
(307) 673-4303
www.swca.com

SWCA Project No. 61279

October 2021

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1 Introduction **1**

2 Baseline Hydrology Monitoring Methodology **3**

2.1 Surface Water Sampling 3

2.2 Groundwater Sampling 4

3 Results **5**

4 Literature Cited **8**

Appendices

Appendix A. Photographs of Restrictive Conditions

Appendix B. Surface Water Laboratory Analysis Results

Figures

Figure 1. Project location. 2

Figure 2. Security-1. Photograph taken on September 9, 2020. 3

Figure 3. Security-2. Photograph taken on September 9, 2020. 4

Tables

Table 1. Laboratory and Field Results 6

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1 INTRODUCTION

Bentonite Performance Minerals, LLC, (BPM) contracted SWCA Environmental Consultants (SWCA) to help gather baseline hydrology data for the proposed Security Project (project) to meet the requirements of South Dakota Codified Law 45-6B-7(9). The proposed location of the bentonite mining project encompasses 128.4 acres between the Belle Fourche River and Middle Creek approximately 3 miles northwest of Belle Fourche, South Dakota (project area) (Figure 1). Mine-related disturbance would be limited to the area north of 3 View Road. There will be no mine related disturbance south of 3 View Road. Specifically, the project area lies in Township 9 North, Range 2 East, Butte County, SD:

Section 31: SE4SE4NE4NE4, E2E2SE4NE4 and that portion of the E2E2NE4SE4 north of 3 View Road.

Section 32: SW4NW4, NW4SW4, W2W2NE4SW4, those portions of the S2S2NW4NW4, SW4NE4NW4, & W2W2SE4NW4 south of the ACC Haul Road and those portions of the W2W2SE4SW4 & NE4SW4SW4 north of 3 View Road.

Bentonite mining along the Belle Fourche River and Middle Creek between Colony, Wyoming, and Belle Fourche, South Dakota, has taken place for many years. Middle Creek is a perennial stream that lies north-northwest of the project area. The stream is approximately 650 feet from the closest point of the project boundary and has an annual mean flow of 2 cubic feet per second in that area (U.S. Geological Survey). The Belle Fourche River is a perennial stream that lies south of the project area. A hill separates the project area from the Belle Fourche River, this river is approximately 600 feet from the closest point of the project boundary. The Belle Fourche River has an annual mean flow of 228 cubic feet per second in that area (U.S. Geological Survey 2021). There will be no direct mining impacts to either of these streams.

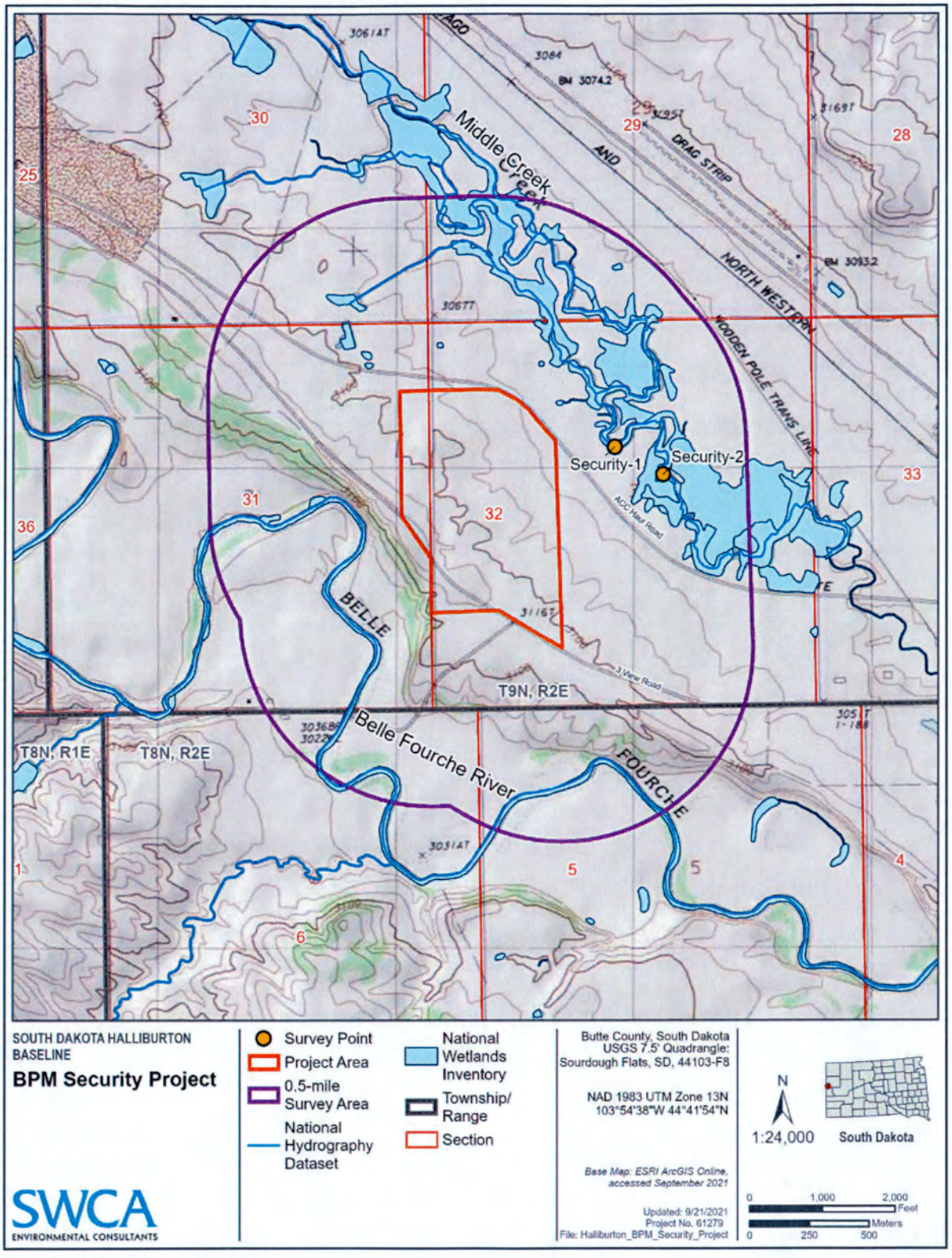


Figure 1. Project location.

2 BASELINE HYDROLOGY SAMPLING METHODOLOGY

BPM and SWCA conducted baseline hydrology sampling to meet the requirements of South Dakota Codified Law 45-6B-7(9).

2.1 Surface Water Sampling

BPM and SWCA conducted surface water sampling in accordance with the guidance provided by Roberta Hudson, Minerals and Mining Program Engineering Manager, South Dakota Department of Agriculture and Natural Resources (SD DANR). Personnel conducted surface water sampling at two locations on Middle Creek within 0.5 mile of the project boundary. Security-1 is the upstream monitoring location, and Security-2 is the downstream monitoring location (see Figures 1 through 3).

3 View Road acts as a ridge immediately south of the portion of the project area that will involve mining activity and serves as a physical barrier between the mining operations and the Belle Fourche River. Therefore, the stream would not receive surface water discharges from mining-related activities. There were no stock water ponds identified downgradient of the proposed mine location. As a result, SD DARN did not require monitoring of the Belle Fourche River or any stock ponds in the area.



Figure 2. Security-1. Photograph taken on September 9, 2020.



Figure 3. Security-2. Photograph taken on September 9, 2020.

Per the SD DANR, personnel attempted to collected surface water samples from the monitoring sites each month from September 2020 through August 2021, measuring pH, electrical conductivity (EC), and temperature in the field and submitting the samples to Mid Continent Testing Laboratories for analysis of total dissolved solids (TDS). SWCA conducted the initial sampling event in September 2020 to verify that no active raptor nests would restrict access to the sample locations. BPM collected the subsequent monthly samples and sent them directly to the lab for analysis. Freezing conditions from December 2020 through February 2021 precluded sampling (see Figures A-1–A-6 in Appendix A), dry conditions precluded sampling at Security-1 in August and at Security-2 in July and August 2021 (Figures A7–A-10).

2.2 Groundwater Sampling

No groundwater wells are within the permit boundary for the proposed mining activities and no groundwater was encountered during exploratory drilling. As a result, the SD DANR required no groundwater sampling for the project.

3 RESULTS

Table 1 summarizes the field and laboratory analysis of the samples collected between September 2020 and August 2021. Appendix B contains detailed laboratory analysis results. The pH of the samples ranged from 7.3 to 8.7 standard units (SU) and averaged 8.0 SU. As expected, the field and laboratory measurements of EC were strongly correlated. The laboratory EC measurements ranged from 1,210 to 8,610 micromhos per centimeter (µmhos/cm) and averaged 3,489 µmhos/cm. The Security-1 EC concentrations were consistently higher than the Security-2 concentrations. TDS ranged from 22 to 7,800 milligrams/liter (mg/L) and averaged 2,021 mg/L. The Security-1 TDS concentrations were higher than the Security-2 concentrations, except in March. The temperature of the samples ranged from 42.5 to 76.0 degrees Fahrenheit (°F), with the warmest temperatures in the summer, as one would expect.

Table 1. Laboratory and Field Results

Site	Date	Sampler or Observer	Field Temperature (°F)	Field pH (SU)	Laboratory pH (SU)	Field EC (µmhos/cm)	Laboratory EC (µmhos/cm)	TDS (mg/L)
Security 1	9/9/2020	Leewood Oakley	64.9	8.43	7.86	3850	3760	2980
Security 2	9/9/2020	Leewood Oakley	62.1	7.89	7.76	1440	1510	1000
Security 1	10/12/2021	Michael Barr	62.5	8.68	8.52	8610	8900	7800
Security 2	10/12/2021	Michael Barr	59.9	8.19	8.11	1770	1840	1250
Security 1	11/17/2020	Michael Barr	42.5	7.45	7.69	2760	2400	1820
Security 2	11/17/2020	Michael Barr	43.0	7.55	7.82	1430	1340	955
Security 1*	12/22/2020	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 2*	12/22/2020	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 1*	1/22/2021	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 2*	1/22/2021	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 1*	2/22/2021	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 2*	2/22/2021	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 1	3/22/2021	Michael Barr	54.7	7.96	8.04	3060	2700	22.0
Security 2	3/22/2021	Michael Barr	54.3	7.63	7.80	1210	1110	414
Security 1	4/28/2021	Jennifer Harman	63.3	8.56	8.37	3610	3150	2380
Security 2	4/28/2021	Jennifer Harman	64	8.50	8.12	1580	1430	916
Security 1	5/21/2021	Michael Barr	70.5	7.78	7.97	4560	4100	3280
Security 2	5/21/2021	Michael Barr	73.0	8.01	8.25	1930	1860	1280
Security 1	6/16/2021	Michael Barr	73.6	7.92	7.98	5470	4390	90
Security 2	6/16/2021	Michael Barr	76.6	7.30	7.57	3500	2830	30
Security 1	7/20/2021	Michael Barr	76.6	8.27	8.38	7560	7130	6100
Security 2†	7/20/2021	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 1†	8/25/2021	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A
Security 2†	8/25/2021	Michael Barr	N/A	N/A	N/A	N/A	N/A	N/A

Minimum	42.5	7.30	7.57	1210	1110	30
Maximum	76.6	8.68	8.52	8610	8900	7800
Average	62.8	8.01	8.02	3489	3230	2021

* No samples taken because of frozen conditions.

† No samples taken because of dry conditions.

4 LITERATURE CITED

U.S. Geological Survey (USGS). 2021. National Hydrography Dataset. Available at: http://viewer.nationalmap.gov/viewer/nhd.html?p=nhd. Accessed April 2021.

APPENDIX A

Photographs of Restrictive Conditions



Figure A-1. Ice on surface at Security-1. Photograph taken on December 22, 2020.



Figure A-2. Ice on surface at Security-2. Photograph taken on December 22, 2020.



Figure A-3. Ice and snow on surface at Security-1. Photograph taken on January 22, 2021.

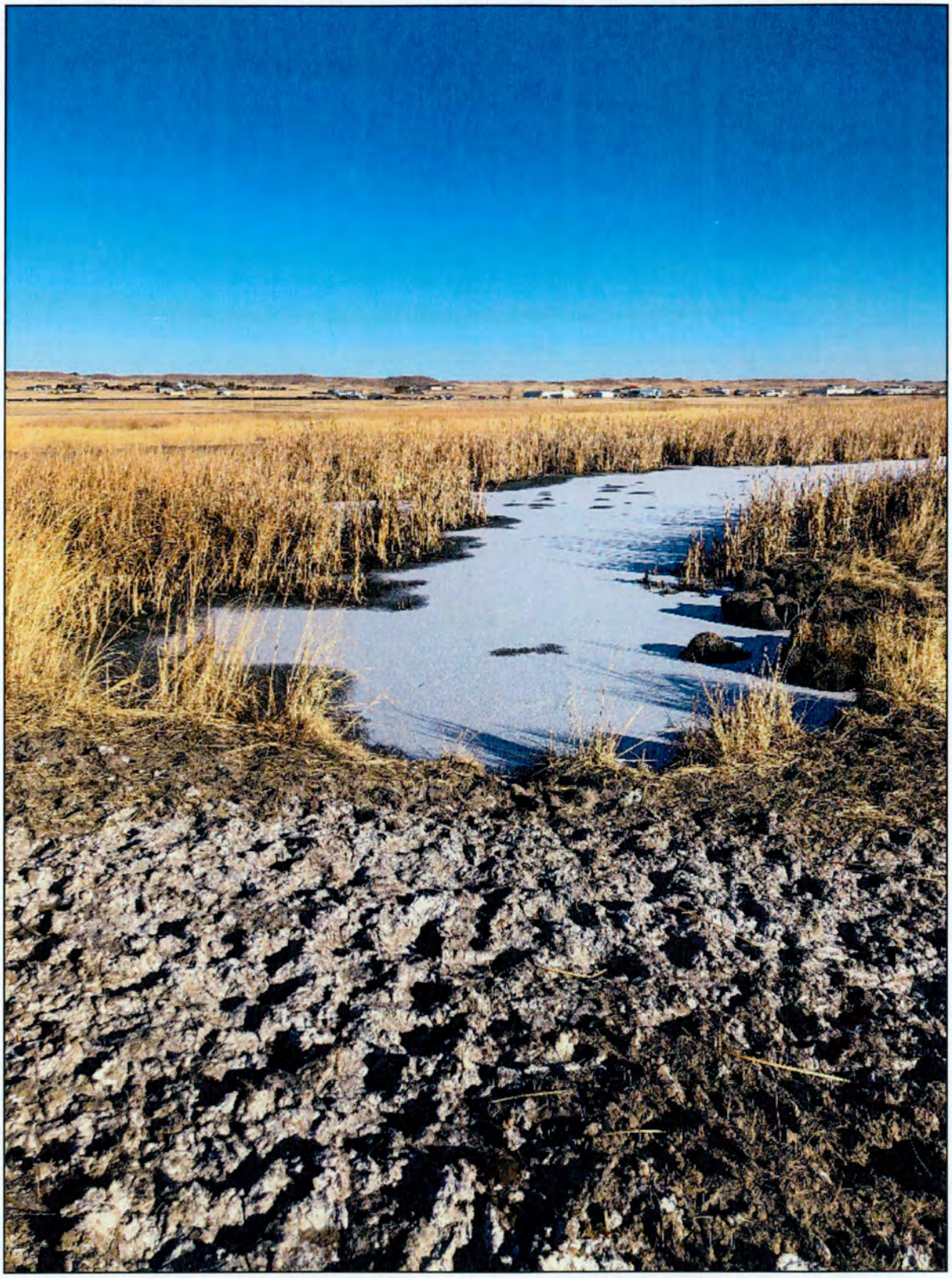


Figure A-4. Ice and snow on surface at Security-2. Photograph taken on January 22, 2021.



Figure A-5. Ice on surface at Security-1. Photograph taken on February 22, 2021.



Figure A-6. Ice on surface at Security-2. Photograph taken on February 22, 2021.

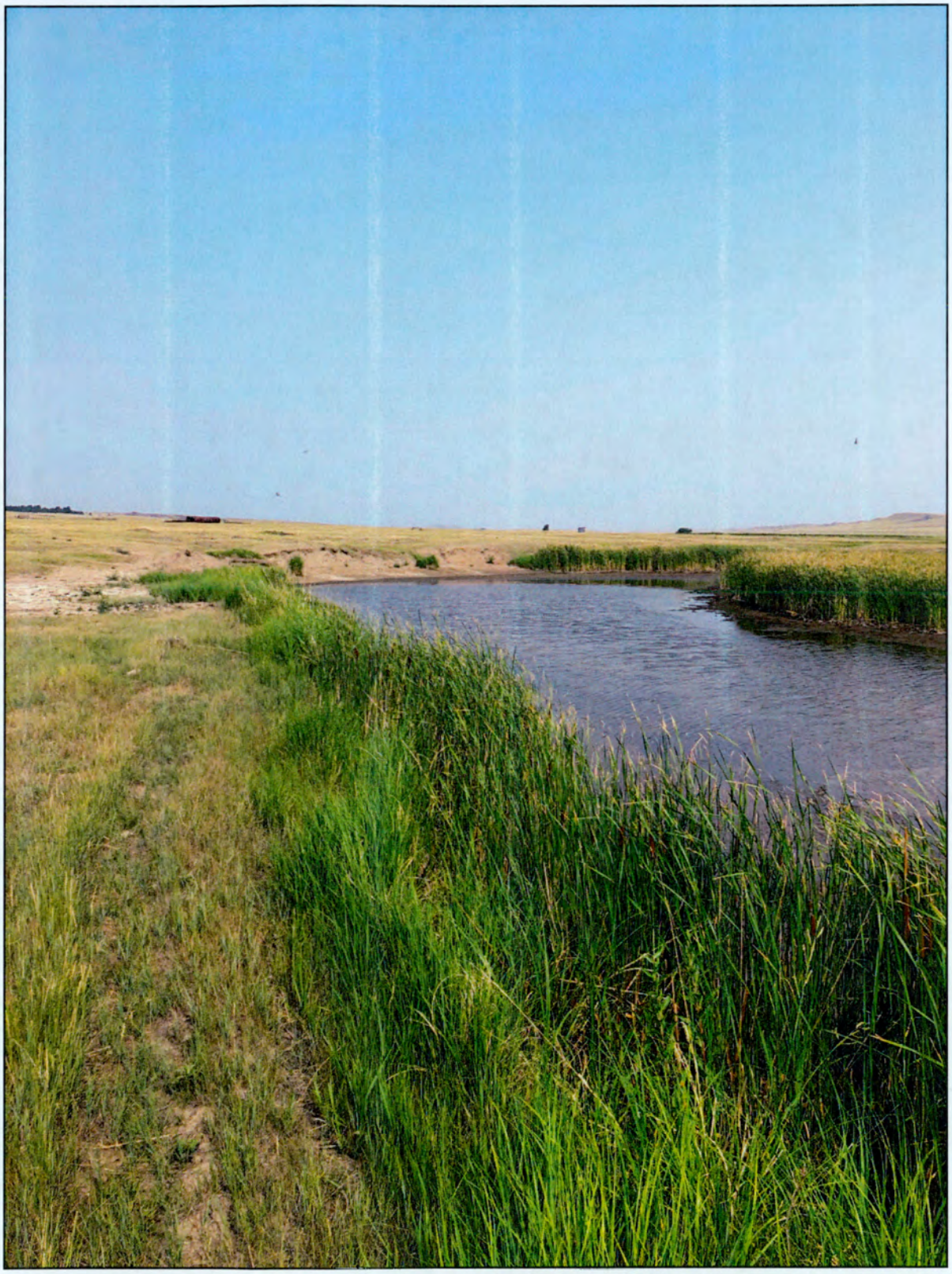


Figure A-7. Dry conditions at Security-1. Photograph taken on July, 20 2021.

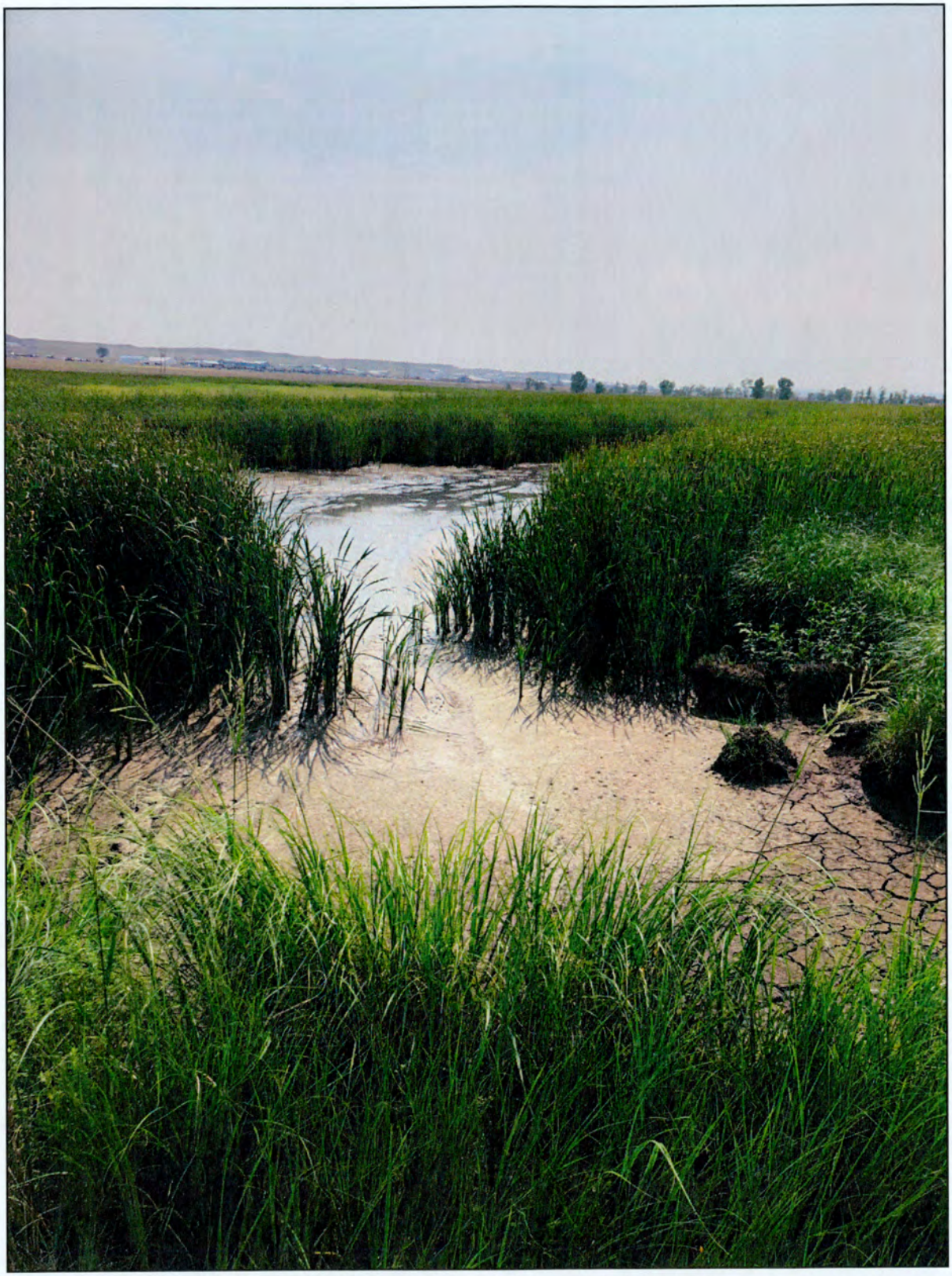


Figure A-8. Dry conditions at Security-2. Photograph taken on July 20, 2021.



Figure A-9. Dry conditions at Security-1. Photograph taken on August 25, 2021.

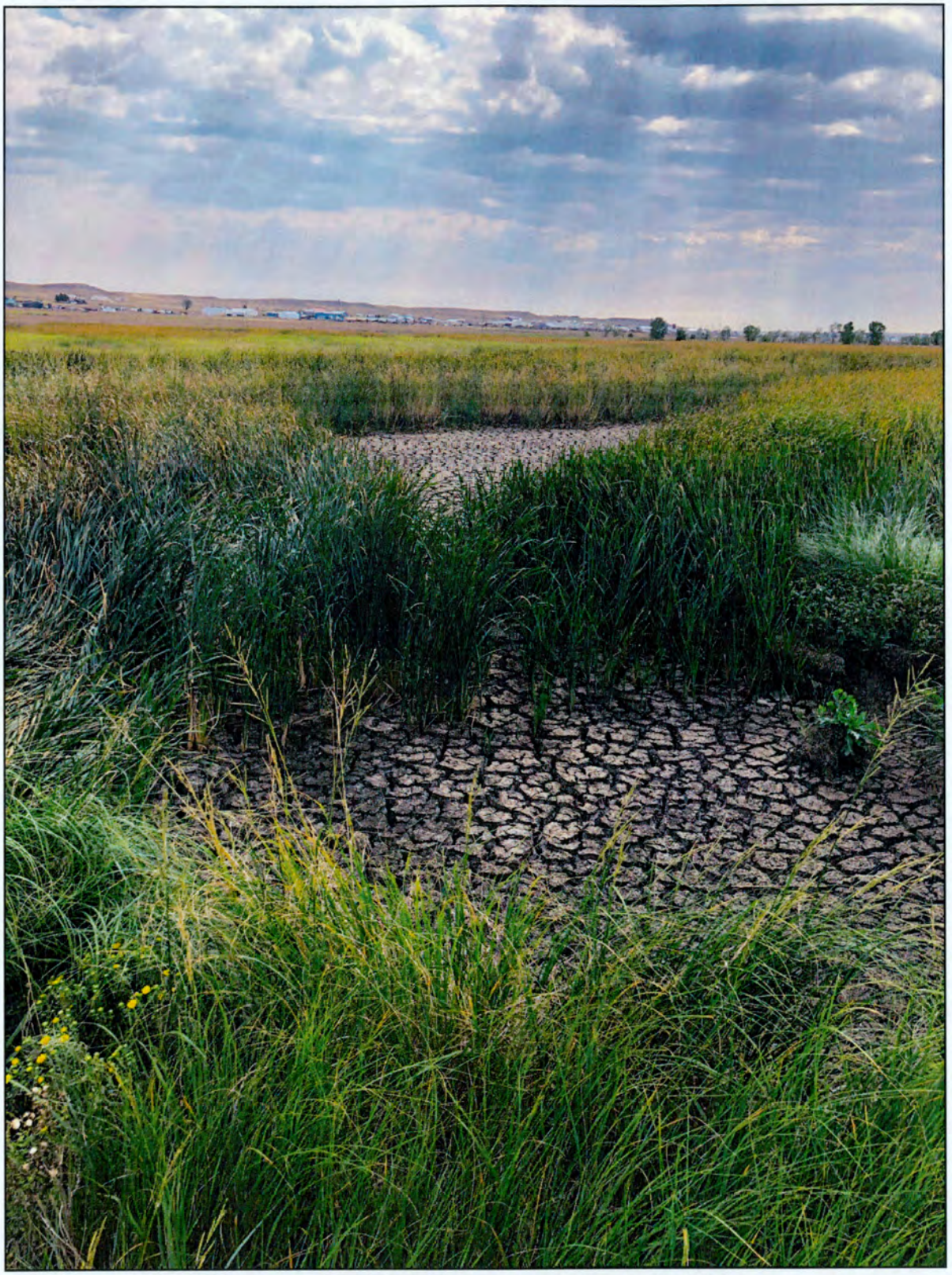


Figure A-10. Dry conditions at Security-2. Photograph taken August 25, 2021.

APPENDIX B

Surface Water Laboratory Analysis Results

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 09/09/20 at 12:18 PM by Jennifer Hartman
Sample Matrix: Water

Lab ID#: 20200911106
Received: 09/10/20 at 02:05 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	3760	µmhos/cm	1	0.168	5.00	SM 2510B	JAM	09/14/20
pH	7.86	S.U.	1			SM 4500-H+ B	JAM	09/14/20
Total Dissolved Solids	2980	mg/L	100ml	14.7	50.0	SM 2540 C	JNM	09/10/20
Field Test								
Field Conductivity	3.85	mS/cm	1			Field Conductivity	SYS	09/09/20
Field pH	8.43	S.U.	1			Field pH	SYS	09/09/20
Field Temperature	64.9	° F	1			Field Temp.	SYS	09/09/20

Notes:
field data added per client request 12/11/2020

Report Approved By:

Report Approved On: 12/11/2020 11:49:06 AM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 2
Sampled: 09/09/20 at 12:33 PM
by Jennifer Hartman
Sample Matrix: Water

Lab ID#: 20200911107
Received: 09/10/20 at 02:05 PM
by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	1510	µmhos/cm	1	0.168	5.00	SM 2510B	JAM	09/14/20
pH	7.76	S.U.	1			SM 4500-H+ B	JAM	09/14/20
Total Dissolved Solids	1000	mg/L	100ml	14.7	50.0	SM 2540 C	JNM	09/10/20
Field Test								
Field Conductivity	1440	µmhos/cm	1			Field Conductivity	SYS	09/09/20
Field pH	7.89	S.U.	1			Field pH	SYS	09/09/20
Field Temperature	62.1	° F	1			Field Temp.	SYS	09/09/20

Notes:
field data added per client request 12/11/2020

Report Approved By:

Report Approved On: 12/11/2020 11:49:06 AM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 10/12/20 at 02:08 PM by Michael Barr
Sample Matrix: Water

Lab ID#: 20201014303
Received: 10/13/20 at 01:05 PM by Julie Muzzy
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst/Date	
Physical Properties								
Electrical Conductivity	8900	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	10/14/20
pH	8.52	S.U.	1			SM 4500-H+ B	JAM	10/14/20
Total Dissolved Solids	7800	mg/L	100ml	14.7	50.0	SM 2540 C	JNG	10/14/20
Field Test								
Field Conductivity	8.61	mS/cm	1			Field Conductivity	SYS	10/14/20
Field pH	8.68	S.U.	1			Field pH	SYS	10/14/20
Field Temperature	62.5	° F	1			Field Temp.	SYS	10/14/20

Report Approved By:

Report Approved On: 12/11/2020 11:50:30 AM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 2
Sampled: 10/12/20 at 02:16 PM by Michael Barr
Sample Matrix: Water

Lab ID#: 20201014304
Received: 10/13/20 at 01:05 PM by Julie Muzzy
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	1840	µmhos/cm	1	0.168	5.00	SM 2510B	JAM	10/14/20
pH	8.11	S.U.	1			SM 4500-H+ B	JAM	10/14/20
Total Dissolved Solids	1250	mg/L	100ml	14.7	50.0	SM 2540 C	JNM	10/14/20
Field Test								
Field Conductivity	1770	µmhos/cm	1			Field Conductivity	SYS	10/14/20
Field pH	8.19	S.U.	1			Field pH	SYS	10/14/20
Field Temperature	59.9	° F	1			Field Temp.	SYS	10/14/20

Report Approved By:

Report Approved On: 10/15/2020 3:21:50 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 11/17/20 at 11:10 AM by Michael Barr
Sample Matrix: Water

Lab ID#: 20201118105
Received: 11/17/20 at 02:10 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst/Date
Physical Properties							
Electrical Conductivity	2400	µmhos/cm	1	0.153	5.00	SM 2510B	JAM 11/19/20
pH	7.69	S.U.	1			SM 4500-H+ B	JAM 11/19/20
Total Dissolved Solids	1820	mg/L	100ml	14.7	50.0	SM 2540 C	JNG 11/18/20
Field Test							
Field Conductivity	2.76	mS/cm	1			Field Conductivity	SYS 11/17/20
Field pH	7.45	S.U.	1			Field pH	SYS 11/17/20
Field Temperature	42.5	° F	1			Field Temp.	SYS 11/17/20

Report Approved By:

Report Approved On: 11/20/2020 1:58:14 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 2
Sampled: 11/17/20 at 11:17 AM
by Michael Barr
Sample Matrix: Water

Lab ID#: 20201118106
Received: 11/17/20 at 02:10 PM
by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	1340	µmhos/cm	1	0.168	5.00	SM 2510B	JAM	11/19/20
pH	7.82	S.U.	1			SM 4500-H+ B	JAM	11/19/20
Total Dissolved Solids	955	mg/L	100ml	14.7	50.0	SM 2540 C	JNM	11/18/20
Field Test								
Field Conductivity	1430	µmhos/cm	1			Field Conductivity	SYS	11/17/20
Field pH	7.55	S.U.	1			Field pH	SYS	11/17/20
Field Temperature	43.0	° F	1			Field Temp.	SYS	11/17/20

Report Approved By:

Report Approved On: 11/20/2020 1:58:14 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 03/22/21 at 11:25 AM
by Michael Barr
Sample Matrix: Water

Lab ID#: 20210323203
Received: 03/22/21 at 02:30 PM
by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst/Date
Physical Properties							
Electrical Conductivity	2700	µmhos/cm	1	0.153	5.00	SM 2510B	JAM 03/23/21
pH	8.04	S.U.	1			SM 4500-H+ B	JAM 03/23/21
Total Suspended Solids	22.0	mg/L	100ml	2.37	10.0	SM 2540 D	JNM 03/23/21
Field Test							
Field Conductivity	3.06	mS/cm	1			Field Conductivity	SYS 03/23/21
Field pH	7.96	S.U.	1			Field pH	SYS 03/23/21
Field Temperature	54.7	° F	1			Field Temp.	SYS 03/23/21

Notes:
Field parameters provided by client as per email.

Report Approved By:

Report Approved On: 3/26/2021 12:54:58 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 2
Sampled: 03/22/21 at 11:30 AM by Michael Barr
Sample Matrix: Water

Lab ID#: 20210323204
Received: 03/22/21 at 02:30 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	1110	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	03/23/21
pH	7.80	S.U.	1			SM 4500-H+ B	JAM	03/23/21
Total Suspended Solids	414	mg/L	100ml	2.37	10.0	SM 2540 D	JNM	03/23/21
Field Test								
Field Conductivity	1210	µmhos/cm	1			Field Conductivity	SYS	03/23/21
Field pH	7.63	S.U.	1			Field pH	SYS	03/23/21
Field Temperature	54.3	° F	1			Field Temp.	SYS	03/23/21

Notes:
Field parameters provided by client as per email.

Report Approved By:

Report Approved On: 3/26/2021 12:54:58 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 04/28/21 at 10:35 AM by Jennifer Hartman
Sample Matrix: Water

Lab ID#: 20210429101
Received: 04/28/21 at 02:55 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	3150	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	04/29/21
pH	8.37	S.U.	1			SM 4500-H+ B	JAM	04/29/21
Total Dissolved Solids	2380	mg/L	100ml	13.0	50.0	SM 2540 C	JNM	04/29/21
Field Test								
Field Conductivity	3610	µmhos/cm	1			Field Conductivity	SYS	04/29/21
Field pH	8.56	S.U.	1			Field pH	SYS	04/29/21
Field Temperature	63.3	° F	1			Field Temp.	SYS	04/29/21

Notes:
Field data provided by client.

Report Approved By:

Report Approved On: 5/3/2021 10:52:17 AM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 2
Sampled: 04/28/21 at 10:44 AM by Jennifer Hartman
Sample Matrix: Water

Lab ID#: 20210429102
Received: 04/28/21 at 02:55 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	1430	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	04/29/21
pH	8.12	S.U.	1			SM 4500-H+ B	JAM	04/29/21
Total Dissolved Solids	916	mg/L	100ml	13.0	50.0	SM 2540 C	JNM	04/29/21
Field Test								
Field Conductivity	1580	µmhos/cm	1			Field Conductivity	SYS	04/29/21
Field pH	8.50	S.U.	1			Field pH	SYS	04/29/21
Field Temperature	64.0	° F	1			Field Temp.	SYS	04/29/21

Notes:
Field data provided by client.

Report Approved By:

Report Approved On: 5/3/2021 10:52:17 AM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 05/20/21 at 11:10 AM by Barr, Dan
Sample Matrix: Water

Lab ID#: 20210521206
Received: 05/20/21 at 03:45 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst/Date	
Physical Properties								
Electrical Conductivity	4100	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	05/24/21
pH	7.97	S.U.	1			SM 4500-H+ B	JAM	05/21/21
Total Dissolved Solids	3280	mg/L	100ml	13.0	50.0	SM 2540 C	TMN	05/21/21
Field Test								
Field Conductivity	4560	µmhos/cm	1			Field Conductivity	SYS	05/21/21
Field pH	7.78	S.U.	1			Field pH	SYS	05/21/21
Field Temperature	70.5	° F	1			Field Temp.	SYS	05/21/21

Report Approved By:

Report Approved On: 5/27/2021 2:33:54 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 2
Sampled: 05/20/21 at 11:20 AM by Barr, Dan
Sample Matrix: Water

Lab ID#: 20210521207
Received: 05/20/21 at 03:45 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	1860	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	05/24/21
pH	8.25	S.U.	1			SM 4500-H+ B	JAM	05/21/21
Total Dissolved Solids	1280	mg/L	100ml	13.0	50.0	SM 2540 C	TMN	05/21/21
Field Test								
Field Conductivity	1930	µmhos/cm	1			Field Conductivity	SYS	05/21/21
Field pH	8.01	S.U.	1			Field pH	SYS	05/21/21
Field Temperature	73.0	° F	1			Field Temp.	SYS	05/21/21

Report Approved By:

Report Approved On: 5/27/2021 2:33:54 PM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 06/16/21 at 10:58 AM by Michael Barr
Sample Matrix: Water

Lab ID#: 20210617112
Received: 06/16/21 at 02:37 PM by Dean Aurand
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	4390	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	06/17/21
pH	7.98	S.U.	1			SM 4500-H+ B	JAM	06/17/21
Total Suspended Solids	90.0	mg/L	100ml	2.37	10.0	SM 2540 D	JNG	06/17/21
Field Test								
Field Conductivity	5470	µmhos/cm	1			Field Conductivity	BLL	06/16/21
Field pH	7.92	S.U.	1			Field pH	BLL	06/16/21
Field Temperature	73.6	° F	1			Field Temp.	BLL	06/16/21

Report Approved By:

Report Approved On: 6/22/2021 11:39:57 AM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 2
Sampled: 06/16/21 at 11:06 AM by Michael Barr
Sample Matrix: Water

Lab ID#: 20210617113
Received: 06/16/21 at 02:37 PM by Dean Aurand
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	2830	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	06/17/21
pH	7.57	S.U.	1			SM 4500-H+ B	JAM	06/17/21
Total Suspended Solids	30.0	mg/L	100ml	2.37	10.0	SM 2540 D	JNG	06/17/21
Field Test								
Field Conductivity	3500	µmhos/cm	1			Field Conductivity	BLL	06/16/21
Field pH	7.30	S.U.	1			Field pH	BLL	06/16/21
Field Temperature	76.6	° F	1			Field Temp.	BLL	06/16/21

Report Approved By:

Report Approved On: 6/22/2021 11:39:57 AM

MIDCONTINENT
TESTING LABORATORIES, INC.

2381 South Plaza Drive P.O. Box 3388 Rapid City, SD 57709
(605) 348-0111 -- www.thechemistrylab.com

Sample Site: Security 1
Sampled: 07/19/21 at 10:10 AM by Michael Barr
Sample Matrix: Water

Lab ID#: 20210720204
Received: 07/19/21 at 02:30 PM by Bobbie Laurenz
Account: W1372 - BPM Minerals- Belle Fourche

JENNIFER HARTMAN
BENTONITE PERFORMANCE MINERALS, LLC
554 US HWY 212
BELLE FOURCHE, SD 57717

Parameter	Result	Units	DF	MDL	PQL	Method	Analyst	Date
Physical Properties								
Electrical Conductivity	7130	µmhos/cm	1	0.153	5.00	SM 2510B	JAM	07/20/21
pH	8.38	S.U.	1			SM 4500-H+ B	JAM	07/20/21
Total Dissolved Solids	6100	mg/L	100ml	13.0	50.0	SM 2540 C	JNG	07/20/21
Field Test								
Field Conductivity	7560	µmhos/cm	1			Field Conductivity	SYS	07/20/21
Field pH	8.27	S.U.	1			Field pH	SYS	07/20/21
Field Temperature	76.6	° F	1			Field Temp.	SYS	07/20/21

Report Approved By:

Report Approved On: 7/23/2021 2:44:51 PM

ATTACHMENT 6

Baseline Wildlife Survey Results for Proposed Security Project, Butte County, South Dakota

RECEIVED
FEB 28 2024
MINERALS & MINING PROGRAM

Baseline Soil Report

BPM Security Bentonite Mine

Bentonite Performance Minerals, LLC, Security Project Baseline Soil Survey, Butte County, South Dakota

SEPTEMBER 2021, REVISED DECEMBER 2022

PREPARED FOR

Bentonite Performance Minerals, LLC

SUBMITTED TO

South Dakota Department of Agriculture and Natural Resources

PREPARED BY

SWCA Environmental Consultants

BENTONITE PERFORMANCE MINERALS, LLC, SECURITY PROJECT BASELINE SOIL SURVEY, BUTTE COUNTY, SOUTH DAKOTA

Prepared for

Bentonite Performance Minerals, LLC
Belle Fourche, South Dakota 57717

Submitted to

South Dakota Department of Agriculture and Natural Resources
523 E. Capitol Ave.
Pierre, South Dakota 57501
(605) 773-4201

Prepared by

Chris Johnston
Project Manager, CPSS

1892 South Sheridan Avenue
Sheridan, Wyoming 82801
(307) 673-4303
www.swca.com

SWCA Project No. 61279

September 2021, Revised December 2022

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Appendices

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Appendix B. Sampled Soil Series Descriptions
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Appendix E. Field Soil Profile Descriptions
Appendix F. Map

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1 INTRODUCTION

SWCA Environmental Consultants (SWCA) conducted a baseline soil survey for Bentonite Performance Minerals' Security Project, located in Butte County, South Dakota. Data collection, sampling design, and methods were devised to provide data suitable for describing soil resources in accordance with the requirements of the South Dakota Mined Land Reclamation Act and the South Dakota Mined Land Reclamation Rules. The regulatory agency is the South Dakota Department of Agriculture and Natural Resources (SD DANR).

The Natural Resources Conservation Service (NRCS) initially completed an Order 2/3 soil survey in 1969 that covered the study area. The most current NRCS soil survey information for the area was accessed through the NRCS Web Soil Survey (NRCS 2019).

SWCA conducted a more intensive Order 1/2 soil survey over the portion of the project area where disturbances will occur to meet requirements and provide the information needed for environmental analysis, permitting, and reclamation. For the area across 3 V Road to the southwest, where no disturbance is expected, the NRCS Map Units are provided for reference. This report provides the results of the baseline soil study.

2 METHODS

2.1 General

An SWCA Certified Professional Soil Scientist (Chris Johnston, CPSS # 200121) conducted a review of the existing literature and completed all soil survey fieldwork and reporting associated with this project.

2.2 Review of Existing Literature

SWCA accessed the Web Soil Survey (NRCS 2019) to review the existing Order 2/3 level soil survey that covers the project area. NRCS soil series descriptions were used to identify soil series present in the field.

2.3 Soil Survey

Field mapping of soil boundaries was conducted in accordance with the standards of the National Soil Survey Handbook (U.S. Department of Agriculture [USDA], 2017). Other references used during the study included the U.S. Department of Agriculture (USDA) Soil Survey Manual (Soil Science Division Staff 2017) and USDA Field Book for Describing and Sampling Soils, Version 2.0 (Schoeneberger, et. al., 2002). Wyoming Department of Environmental Quality (WDEQ) Guideline No. 1A Topsoil and Subsoil (WDEQ 2015) was used as a guide to assess the topsoil and subsoil resources and compile information included in this permit application as South Dakota does not have a similar applicable soils guideline.

SWCA conducted an Order 1/2 soil survey of the project area in the spring of 2021. Soil profiles were collected throughout the permit area using a trailer-mounted Giddings hydraulic soil sampling, coring, and drilling machine. Physical and chemical characteristics of the topsoil were used to delineate soils into mapping units. Soil mapping unit boundaries were plotted on an appropriate map included in Appendix F.

Topsoil salvage depths were determined using field observations and laboratory data. Topsoil and subsoil salvage depths vary slightly within each series based on topography, precipitation, aspect, and other soil forming factors. Topsoil and subsoil volumes were calculated for each soil mapping unit and are summarized in Table A-6 through A-8 in Appendix A. Most soil mapping units have some topsoil and subsoil suitable for salvage.

2.4 Soil Sampling, Description, and Analysis

A minimum of one laboratory confirmation sample was collected for each soil series identified in the field. Samples were collected to a depth of at least 60 inches or shallower if paralithic contact or an impermeable layer was encountered. Soil samples were collected by horizon and delivered to Pace Analytical, Wyoming, for analysis of pH, Electrical Conductivity (EC), saturation %, texture, coarse fragments, calcium, magnesium, potassium, sodium adsorption ratio (SAR), selenium, boron, and organic matter per WDEQ Guideline 1A.

Soil profiles were described in the field and GPS coordinates were collected for each sample location. Sample locations are identified in Table A-1 (Appendix A) and on the map included in Appendix F. NRCS official soil series descriptions for those soil series found in the project area are included in Appendix B (NRCS, 2019a). Soil profile descriptions for each soil identified in the project area are included in Appendix E.

3 RESULTS AND DISCUSSION

3.1 Soil Survey

As stated above, the purpose of the soil survey was to establish the amount of topsoil and subsoil resources present in the project area. Soils within the project area consist mainly of fine-textured soils ranging from loam to clay in the surface horizon, and silty clay to clay in the subsurface horizons. Generally, shallower soils were found on hills, ridges, and uplands, and moderate to deep soils were found on alluvial fans, terraces, and in drainages.

3.2 Analytical Results

Laboratory analysis was completed on the physical and chemical parameters to establish suitability of soils for salvage. Laboratory soil texture analysis did not include percent very fine and fine sand as the soils within the project area are generally fine-textured. Original laboratory data sheets are included in Appendix C.

3.3 Soil Erosion Properties

Water and wind erosion hazards for the project area were also evaluated using SSURGO data (NRCS, 2019b). The soil erodibility factor, or K-Factor, is an estimate of the susceptibility of the soil for water to detach and move soil particles and can vary from 0.02 to 0.69, with values increasing with higher estimates of soil erosion as a result of flowing water. The potential for water erosion varied from slight to moderate. The wind erodibility factor is an estimate of the susceptibility to wind erosion and ranges from 1 to 8, with the lower classes representing those soil that are most susceptible to wind erosion. The potential for wind erosion is moderate for all soils. The fine texture of many of the soils found in the project area make them more susceptible to water erosion than wind erosion. A summary of wind and water erosion hazards is included in Table A-4 (Appendix A).

3.4 Soil Suitability Evaluation

The WDEQ Guideline 1A criteria to establish suitability of topsoil were used to determine topsoil and subsoil salvage depths for each soil series/mapping unit identified. Laboratory results indicate that all profiles sampled have some limiting chemical or physical parameter in the profile that makes the topsoil marginally suitable or unsuitable. Limiting parameters indicated by the laboratory results include pH, EC, SAR, saturation %, and texture. Marginal and unsuitable parameters are summarized in Table A-5.

The only soil map unit within the project area that was not field sampled was the Nunn Loam (CmA) which is located southwest of 3 View Road and will not be disturbed. Desktop analysis results show that there are 10 inches of topsoil and 8 inches of subsoil that could potentially salvaged. The available data does not show any limiting chemical or physical properties within the topsoil but should be analyzed by a laboratory before disturbance. The subsoil desktop analysis shows that texture could be a limiting physical property and no chemical limitations according to the available data. The subsoil should also be laboratory analyzed prior to disturbance.

3.5 Topsoil Volume Calculations

Topsoil and subsoil salvage depths for each soil series/mapping unit described within the project area were determined using field and laboratory data. Determined salvage depths were used to calculate the volume of topsoil and subsoil for each soil series/mapping unit in the project area. Volume calculations include all of the project area, including the area southwest of 3 View Road. A summary of topsoil and subsoil depths and volumes is included in Table A-6. The disturbance area volume calculations where active mining will occur is summarized in Table A-7. PCS Farm disturbance area volume calculations can be found in Table A-8.

3.6 Prime Farmland Assessment

Prime farmland was assessed for the project area using the NRCS Web Soil Survey farmland classification tool (Soil Survey Staff, 2019b). No prime farmland was identified.

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APPENDIX A

Tables

Table A-1. Soil Mapping Unit Areas (including NRCS Map Units in Area to Not Be Disturbed).

Map Symbol	Map Unit Description	Total Area (acres)	Total Project Area, %
Bi	Bidman loam, 0 to 6 percent slopes	13.44	9.58
De	Demar loam, 0 to 6 percent slopes	29.66	21.13
Gr	Grummit clay, 3 to 60 percent slopes	16.39	11.68
Gn	Graner clay, 3 to 25 percent slopes	2.87	2.04
Hi	Hisle silt loam, 0 to 15 percent slopes	18.91	13.47
Gr-SL	Grummit – Shale Land	44.08	31.40
SBO	Shale-Bentonite Outcrop	7.00	4.99
DL	Disturbed Land	3.02	2.15
BmA	Bidman loam, 0 to 2 percent slopes	1.32	0.94
CmA	Nunn loam, 0 to 2 percent slopes	1.00	0.71
GnC	Graner clay, 3 to 25 percent slopes	0.77	0.55
ShF	Grummit-Rock outcrop complex, 6 to 40 percent slopes	0.61	0.43
Total		**140.38**	**100.00**

Table A-2. Soil Mapping Unit Areas (within Proposed Disturbance Area).

Map Symbol	Map Unit Description	Total Area (acres)	Total Project Area, %
Bi	Bidman loam, 0 to 6 percent slopes	5.06	6.08
De	Demar loam, 0 to 6 percent slopes	16.49	19.82
Gr	Grummit clay, 3 to 60 percent slopes	12.51	15.04
Gn	Graner clay, 3 to 25 percent slopes	0.90	1.08
Hi	Hisle silt loam, 0 to 15 percent slopes	14.49	17.42
Gr-SL	Grummit – Shale Land	27.72	33.32
SBO	Shale-Bentonite Outcrop	5.56	6.68
DL	Disturbed Land	0.46	0.56
Total		**83.20**	**100.00**

Table A-3. Soil Mapping Unit Areas (within the PCS Farm Disturbance Area).

Map Symbol	Map Unit Description	Total Area (acres)	Total PCS Area, %
De	Demar loam, 0 to 6 percent slopes	9.78	25.57
Gr	Grummit clay, 3 to 60 percent slopes	10.96	28.67
Hi	Hisle silt loam, 0 to 15 percent slopes	6.61	17.29
Gr-SL	Grummit – Shale Land	10.89	28.47
Total		**38.24**	**100.00**

Table A-4. Wind and Water Erosion Hazards for Soils North of 3 V Road.

Map Symbol	Map Unit Description	Water Erosion Hazard[1]	Wind Erosion Hazard[2]
Bi	Bidman loam, 0 to 6 percent slopes	Moderate	Moderate
De	Demar loam, 0 to 6 percent slopes	Moderate	Moderate
Gr	Grummit clay, 3 to 60 percent slopes	Slight	Moderate
Gn	Graner clay, 3 to 25 percent slopes	Slight	Moderate
Hi	Hisle silt loam, 0 to 15 percent slopes	Moderate	Moderate
Gr-SL	Grummit – Shale Land	Slight	Moderate
SBO	Shale-Bentonite Outcrop	--	--
DL	Disturbed Land	--	--

[1]Based on Kw factor, whole soil, from the NRCS Soil Data Mart.
[2]Based on Wind Erodibility Group from the NRCS Soil Data Mart.

Table A-5. Marginal and Unsuitable Parameters within Sampled Profiles.

Soil Sample Number	Soil Series	Depth (inches)	Marginal[1]	Unsuitable[1]
Soil-1	Bidman loam	3-16	pH, Texture	
		16-30	Texture	
		30-39	Texture	
		39-53	Texture	pH
		53-60	Texture	
Soil-2	Grummit clay	0-2	Texture	
		2-8	Texture	
		8-15	Texture	
		15-34	Texture	
Soil-3	Demar loam	0-3	Texture	
		3-17	Texture	
		17-23	Sat %, Texture	
		23-42	Sat %, Texture	SAR
		42-55	Sat %, EC, Texture	SAR
		55-68	Sat %, EC, Texture	SAR
Soil-4	Hisle silt loam	0-2	Texture	
		2-12	Texture	
		12-24	Texture	
		24-41	Texture	pH
		41-48	Texture	pH
Soil-5	Bidman loam	0-3	Texture	
		3-19	Texture	
		19-35	pH, Texture	
		35-52	Texture	pH
Soil-6	Grummit clay	5-15	Sat %, Texture	SAR
		15-27	Sat %, Texture	
		27-53	pH, Sat %, Texture	SAR
Soil-7	Demar loam	0-4	Sat %, Texture	
		4-14	Sat %, EC, Texture	
		14-28	Texture	EC
		28-38	Texture	EC
		38-70	Sat %, Texture	EC
Soil-8	Graner clay	0-6	pH, Texture	
		6-22	Texture	pH
		22-53	Texture	pH

[1]Marginal and unsuitable parameters determined by comparing soil profile descriptions and lab data with WDEQ Guideline 1A Table I-2 criteria to establish topsoil suitability.

Table A-6. Approximate Soil Salvage Depths and Volumes for Sampled Map Units in Project Area.

Map Unit Symbol	Map Unit Name	Soil Sample Location Number	Total Salvage Depth (inches)	Topsoil/ Subsoil Salvage (inches)	Topsoil Volume (cubic yards)	Subsoil Volume, (cubic yards)	Limitations to Deeper Salvage
Bi	Bidman loam, 0 to 6 percent slope	Soil-1 Soil-5	18	3/15	5,953.9	29,769.7	Increased carbonates with $CaCO_3$ mottling
CmA	Nunn loam, 0 to 2 percent slopes	--	18	10/8	1,338.6	1,070.9	High clay content
De	Demar loam, 0 to 6 percent slopes	Soil-3, Soil-7	25	4/21	15,951.5	83,745.3	Shale fragments and $CaCO_3$ mottling
Gr	Grummit clay, 3 to 60 percent slopes	Soil-6	15	5/10	11,020.8	22,041.6	Salvage to shale bedrock at variable depths
Gn	Graner clay, 3 to 25 percent slopes	Soil-8	6	6/0	2,933.4	0.0	Shale fragments
Hi	Hisle silt loam, 0 to 15 percent slopes	Soil-4	12	2/10	5,436.3	27,181.2	Shale fragments and $CaCO_3$ mottling
Gr-SL	Grummit – Shale Land	Soil-2	Gr: 2 SL: 0	2/0 for whole map unit (average salvage depth)	12,017.0	0	Gr: Shale fragments SL: Shale rock outcrop, Shale fragments and $CaCO_3$ mottling
SBO	Disturbed Land	--	0	0	0	0	No soil to salvage
DL	Disturbed Land	--	0	0	0	0	No soil to salvage
Total:					**54,651.5**	**163,808.7**	
Replacement depth (inches)					**3**	**9**	

Table A-7. Approximate Soil Salvage Depths and Volumes for Sampled Map Units (Within Proposed Disturbance Area).

Map Unit Symbol	Map Unit Name	Soil Sample Location Number	Total Salvage Depth (inches)	Topsoil/ Subsoil Salvage (inches)	Topsoil Volume, cubic yards	Subsoil Volume, cubic yards	Limitations to Deeper Salvage
Bi	Bidman loam, 0 to 6 percent slopes	Soil-1, Soil-5	18	3/15	2,041.0	10,205.2	Increased carbonates with $CaCO_3$ mottling
De	Demar loam, 0 to 6 percent slopes	Soil-3, Soil-7	25	4/21	8,870.4	45,569.6	Shale fragments and $CaCO_3$ mottling
Gr	Grummit clay, 3 to 60 percent slopes	Soil-6	15	5/10	8,411.1	16,822.2	Salvage to shale bedrock at variable depths
Gn	Graner clay, 3 to 25 percent slopes	Soil-8	6	6/0	724.9	0.0	Shale fragments
Hi	Hisle silt loam, 0 to 15 percent slopes	Soil-4	12	2/10	3896.3	19,481.3	Shale fragments and $CaCO_3$ mottling
Gr-SL	Grummit – Shale Land	Soil-2	Gr: 2 SL: 0	2/0 for whole map unit (average salvage depth)	7,454.4	0.0	Gr: Shale fragments SL: Shale rock outcrop,
SBO	Shale-Bentonite Outcrop	--	0	0	0.0	0	No soil to salvage
DL	Disturbed Land	--	0	0	0	0	No soil to salvage
Total					**31,398.1**	**93,078.2**	
Replacement depth (inches)					3	8	

Table A-8. Approximate Soil Salvage Depths and Volumes for Sampled Map Units (Within PCS Farm Disturbance Area).

Map Unit Symbol	Map Unit Name	Soil Sample Location Number	Total Salvage Depth (inches)	Topsoil/ Subsoil Salvage (inches)	Topsoil Volume, cubic yards	Subsoil Volume, cubic yards	Limitations to Deeper Salvage
De	Demar loam, 0 to 6 percent slopes	Soil-3, Soil-7	25	4/21	5,257.6	27,602.4	Shale fragments and $CaCO_3$ mottling
Gr	Grummit clay, 3 to 60 percent slopes	Soil-6	15	5/10	7,366.8	14,733.5	Salvage to shale bedrock at variable depths
Hi	Hisle silt loam, 0 to 15 percent slopes	Soil-4	12	2/10	1,777.0	8,885.1	Shale fragments and $CaCO_3$ mottling
Gr-SL	Grummit – Shale Land	Soil-2	Gr: 2 SL: 0	2/0 for whole map unit (average salvage depth)	2,927.0	0.00	Gr: Shale fragments SL: Shale rock outcrop,
Total:					**17,328.4**	**51,221.0**	--
Replacement Depth (inches)					**3**	**10**	

APPENDIX B

Sampled Soil Series Descriptions

LOCATION BIDMAN WY+MT SD

Established Series
CJH-MS
11/2005

BIDMAN SERIES

The Bidman series consists of very deep, well drained soils that formed in alluvium weathered from shale bedrock. Bidman soils are on alluvial fans, fan remnants, terrace, ridges and hills. Slopes are 0 to 25 percent. The mean annual precipitation is about 12 inches, and the mean annual air temperature is about 47 degrees F.

TAXONOMIC CLASS: Fine, smectitic, mesic Ustic Paleargids

TYPICAL PEDON: Bidman loam-grassland. (Colors are for dry soil unless otherwise noted)

E--0 to 5 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (2.5Y 4/2) moist; weak thin platy structure that parts to very fine granules; soft, very friable; uncoated sand grains; slightly acid (pH 6.4); abrupt smooth boundary. (0 to 7 inches thick)

Bt--5 to 18 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure that parts to strong medium angular blocky; hard, very sticky and very plastic; many prominent clay films on faces of peds, in channels and pores; few streaks of bleached sand grains in the upper 2 inches; slightly alkaline (pH 7.4); clear wavy boundary. (6 to 19 inches thick)

Btk--18 to 26 inches; light yellowish brown (2.5Y 6/3) clay loam, light olive brown (2.5Y 5/3) moist; weak coarse prismatic structure that parts to moderate coarse angular and subangular blocks; extremely hard, very friable; sticky and plastic; few distinct clay films on faces of peds; strongly effervescent, calcium carbonate as soft masses and in thin seams and streaks; moderately alkaline (pH 8.4); gradual wavy boundary. (0 to 23 inches thick)

Bk--26 to 60 inches; light olive brown (2.5Y 5/3) clay loam, olive brown (2.5Y 4/3) moist; massive; hard, very friable, sticky and slightly plastic; violently effervescent, calcium carbonate as soft masses; strongly alkaline (pH 8.5).

TYPE LOCATION: Johnson County, Wyoming; 2630 feet north and 20 feet west of the southeast corner of sec. 19, T. 46 N., R. 80 W. 43 degrees 56 minutes 26 seconds north latitude and 106 degrees 30 minutes and 41 seconds west longitude.

RANGE IN CHARACTERISTICS: Depth to calcareous material ranges from 8 to 26 inches. Depth to the base of the argillic horizon range from 15 to 36 inches. Organic carbon ranges from .6 to 1.5 percent in the surface horizons and decreases uniformly with increasing depth. Cation exchange capacity ranges from 60 to 90 milliequivalents per 100 grams of clay.

Rock fragments are typically less than 2 percent but ranges from 0 to 15 percent. This soil is dry in the moisture control section more than half the time cumulative that the soil temperature at a depth of 20 inches is 41 degrees F. It is never moist in some or all parts for as long as 60 consecutive days during this same period. It is dry in all parts of the moisture control section for at least 60 consecutive days from July 15 to October 25 and for at least 90 cumulative days during this period. The mean annual soil temperature is 47 to 53 degrees F., and the soil temperature at a depth of 20 inches is 41 degrees F. or warmer for 175 to 195 days. The mean summer soil temperature at depth of 20 inches ranges from 59 to 65 degrees F.

The E horizon has hue of 2.5Y or 10YR, value of 5 to 7 dry, 4 or 5 moist, and chroma of 2 to 4. It usually has platy structure but has granular structure in some pedons. It is loam, very fine sandy loam or sandy loam. It is soft or slightly hard. Reaction is slightly acid to slightly alkaline. Some pedons have an A horizon.

The Bt horizon has hue of 2.5Y, 10YR or 7.5YR, value of 5 or 6 dry, 4 or 5 moist, and chroma of 2 to 4. It is silty clay, silty clay loam, clay loam or clay but has 35 to 50 percent clay, 15 to 45 percent silt, and 15 to 45 percent sand with more than 15 percent fine or coarser sand. This horizon typically has prismatic structure but has columnar or angular blocky structure in some pedons. It has oriented clay films in some part. Reaction is neutral to moderately alkaline. EC is 0 to 8 mmhos/cm.

The Btk horizon has hue of 10YR or 2.5Y, value of 5 or 6 and 4 or 5 moist, and chroma of 2 to 4. It is clay loam, silty clay loam, clay or silty clay. It is slightly alkaline to strongly alkaline. It has a calcium carbonate equivalent of 5 to 12 percent. It has an EC of 0 to 2 mmhos/cm and 4 to 12 in the saline phase.

The Bk horizon ranges from 5Y, 2.5Y or 10YR, value of 5 to 7 dry, 4 to 6 moist, and chroma of 2 to 4. It is clay loam, loam, sandy clay loam, or light clay. This horizon has 6 to 14 percent calcium carbonate equivalent. Reaction is moderately alkaline or strongly alkaline. EC is 0 to 12 mmhos.

Some pedons have a C horizon below 40 inches that have properties that are similar to the Bk horizon. A gravelly substratum phase is recognized.

COMPETING SERIES: These are the Big Horn, Briggsdale, Campo, Demar, Gibbler and Parmleed series. Briggsdale Gibbler, and Parmleed soils have bedrock at depths of less than 40 inches. Big Horn soils have a calcic horizon. Campo soils formed in eolian parent sediments and have less than 15 percent fine or coarser sand in the Bt and C horizons. Demar soils are acid.

GEOGRAPHIC SETTING: The Bidman soils are on alluvial fans, fan remnants, terraces, ridges and hills. Elevation is 2,600 to 6,000 feet. Slopes range from 0 to 25 percent. These soils formed in thick, calcareous alluvial sediments derived from sedimentary rock. At the type location the mean annual temperature is 47 degrees F., and the mean summer temperature is 66 degrees F. The average annual precipitation is about 12

inches with about half the precipitation in April, May, and June. Precipitation ranges from 10 to 14 inches. The frost-free season is 100 to 130 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the competing Briggsdale soils and the Redig and Wyarno soils. Redig soils are the main associated soils in Butte County, South Dakota. They have high gypsum content and are on more steeply sloping areas. Wyarno soils lack E horizons and do not have an abrupt textural boundary between the A and B horizons.

DRAINAGE AND PERMEABILITY: Well drained; low to high runoff; slow permeability.

USE AND VEGETATION: Used principally as native pastureland but may be tilled to dryland or irrigated crops. Principal native vegetation is blue grama, western wheatgrass, and cactus.

DISTRIBUTION AND EXTENT: Northeastern and central Wyoming and western South Dakota. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Butte County, South Dakota; 1970.

REMARKS: Diagnostic horizons and features recognized in this pedon are:

Albic horizon - 0 to 5 inches (E)

Argillic horizon - 5 to 26 inches (Bt, Btk)

An absolute increase in clay of greater than 15 percent within a vertical distance of 2.5 cm. at the upper boundary of the Bt horizon.

SIR - WY1070

National Cooperative Soil Survey
U.S.A.

LOCATION DEMAR SD+MT WY

Established Series
Rev. MWS-KEC
10/97

DEMAR SERIES

The Demar series consists of deep or very deep, moderately well drained soils formed in clayey alluvium from acid clay shales. These soils are on terraces. They have very slow permeability. Slopes range from 0 to 6 percent. Mean annual precipitation is about 15 inches, and mean annual air temperature is about 47 degrees F.

TAXONOMIC CLASS: Fine, smectitic, mesic Torrertic Haplustalfs

TYPICAL PEDON: Demar loam - on a plane slope of less than 1 percent. When described the soil was moist to 5 inches and dry below. (Colors are for dry soil unless otherwise stated.)

E--0 to 5 inches; pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; weak thin platy structure parting to weak fine granular; slightly hard, friable, slightly sticky; many roots; neutral; abrupt wavy boundary. (3 to 8 inches thick)

Bt1--5 to 12 inches; brown (10YR 5/3) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate coarse columnar structure; very hard, very firm, sticky and plastic; light gray (10YR 7/2) coatings on column tops; few roots; medium acid; clear smooth boundary. (3 to 8 inches thick)

Bt2--12 to 24 inches; grayish brown (10YR 5/2) silty clay, dark grayish brown (10YR4/2) moist; moderate medium blocky structure; very hard, very firm, sticky and plastic; very few roots; very strongly acid; clear smooth boundary. (5 to 12 inches thick)

Bz--24 to 32 inches; grayish brown (10YR 5/2) silty clay, dark grayish brown (10YR 4/2) moist; few fine prominent yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; very hard, very firm, sticky and plastic; very few roots; common fine nests of gypsum and other salts; extremely acid; gradual boundary. (4 to 10 inches thick)

C--32 to 41 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; many coarse prominent brownish yellow (10YR 6/6) mottles; weak coarse subangular blocky structure; very hard, very firm; partially weathered shale fragments make up about 40 percent by volume; common bands of crystals of gypsum; extremely acid; gradual boundary. (8 to 14 inches thick)

Cr--41 to 50 inches; light brownish gray (10YR 6/2) platy clay shale, grayish brown (10YR 5/2) moist; many coarse prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6) iron stains along fractures; extremely acid.

TYPE LOCATION: Butte County, South Dakota; about 1 mile north and 1 mile west of Belle Fourche; 150 feet north and 1400 feet east of the southwest corner of sec. 33, T. 9 N., R. 2 E.

RANGE IN CHARACTERISTICS: The depth to bedded shale ranges from 40 to 60 inches or more. These soils range from neutral to strongly acid in the upper 12 inches and from very strongly acid to extremely acid below this depth.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6 and 4 or 5 moist, and chroma of 2 or 3. It typically is loam but is clay loam in some pedons.

The Bt horizon has hue of 10YR or 2.5Y, value of 5 or 6 and 4 or 5 moist, and chroma of 2 or 3. The clay content of the Bt horizon is between 35 and 60 percent. Structure of the Bt horizon ranges from weak or moderate, medium or coarse columnar in the Bt1 horizon and moderate or strong, medium or coarse blocky in the Bt2 horizon.

The Bz horizon has hue of 10YR or 2.5Y, value of 5 or 6 and 4 to 5 moist, and chroma of 2 to 3. It has common or many accumulations of gypsum and other salts.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6 and 4 or 5 moist, and chroma of 2 or 3. It contains 20 to 50 percent fragments of shale.

COMPETING SERIES: These are the Bidman, Big Horn, Briggsdale, Campo, Gibbler and Parmleed soils. All of these soils have a more alkaline reaction.

GEOGRAPHIC SETTING: Demar soils are on micro-highs on nearly level to gently sloping alluvial terraces having pronounced micro-relief. Slope gradients range from 0 to 6 percent. These soils formed in clayey alluvium derived from acid clay shales. The mean annual air temperature ranges form 45 to 49 degrees F, and mean annual precipitation ranges from 12 to 18 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Broadhurst, Graner, and Grummit soils. All of these soils do not have argillic horizons. In addition, the Graner soils are more friable and the Grummit soils have shale within depths of 20 inches. Broadhurst soils are on similar landscapes as the Demar soils. Graner and Grummit soils are on adjacent undulating to steeply sloping uplands. Demar soils are usually associated with slickspots which are nearly barren and have a nearly continuous dispersed surface crust and are in micro-lows.

DRAINAGE AND PERMEABILITY: Moderately well drained. Runoff is medium. Permeability is very slow.

USE AND VEGETATION: These soils are used primarily for rangeland. Native vegetation is western wheatgrass, blue grama, green needlegrass, needleandthread, buffalograss, sedges, and forbs.

DISTRIBUTION AND EXTENT: Western South Dakota and possibly eastern Wyoming. The series is inextensive.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Butte County, South Dakota, 1970.

REMARKS: Diagnostic horizons and features recognized in this pedon are: ochric epipedon - the zone from the surface of the soil to a depth of about 5 inches; argillic horizon - the zone from 5 to 24 inches (Bt1 and Bt2 horizons).

National Cooperative Soil Survey
U.S.A.

LOCATION GRANER SD

Established Series
Rev. KEC-CJH
02/1999

GRANER SERIES

The Graner series consists of very deep, well drained, moderately permeable soils on uplands. They formed in clayey material derived from acid shale. Slopes range from 2 to 25 percent. Mean annual air temperature is 46 degrees F, and mean annual precipitation is 15 inches.

TAXONOMIC CLASS: Fine, smectitic, acid, mesic Torrertic Ustorthents

TYPICAL PEDON: Graner clay - on northeast-facing slope of 5 percent under native grass. When described the soil was moist to 38 inches. (Colors are for dry soil unless otherwise stated.)

A--0 to 5 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, friable; many fine roots; many very fine shale fragments; very strongly acid; clear smooth boundary. (3 to 6 inches thick)

AC--5 to 20 inches; grayish brown (10YR 5/2) very shaly clay, very dark grayish brown (10YR 3/2) crushing to dark grayish brown (10YR 4/2) moist; weak medium and coarse subangular blocky structure; slightly hard, friable; common fine roots; many very fine shale fragments; very strongly acid; gradual boundary. (8 to 16 inches thick)

C--20 to 60 inches; grayish brown (10YR 5/2) very shaly clay, very dark grayish brown (10YR 3/2) crushing to dark grayish brown (10YR 4/2) moist; very weak coarse subangular blocky structure; slightly hard, friable; few fine roots; many fine shale fragments; extremely acid.

TYPE LOCATION: Butte County, South Dakota; about 8 miles west and 5 miles north of Belle Fourche; 1800 feet west and 500 feet north of southeast corner of sec. 4, T. 9 N., R. 1 E.

RANGE IN CHARACTERISTICS: Colors throughout the soil are largely inherited from the shale. Texture of the control section is clay containing from 55 to 60 percent clay. Consistence is soft or slightly hard when dry and friable when moist. It is strongly acid to extremely acid throughout. The soil has an Ustic moisture regime that borders on Aridic.

The A horizon has hue of 10YR or 2.5Y, value of 4 to 6 and 3 or 4 moist, and chroma of 1 or 2. The A horizon contains less than 1 percent more organic matter than the C. It contains common to many partially weathered very fine shale fragments.

The AC and C horizons have hue of 10YR, 2.5Y, or 5Y; value of 5 or 6 and 3 or 4 moist; and chroma of 2. They contain over 50 percent by volume of

partially weathered very fine shale fragments. Bedded fissile shale is below depths of 40 inches in some pedons.

COMPETING SERIES: There are no other soils in this family.

GEOGRAPHIC SETTING: Graner soils are on undulating to hilly uplands with slope gradients between 2 and 25 percent. They formed in clayey materials derived from acid shales. Mean annual temperature ranges from 45 to 48 degrees F, and mean annual precipitation from about 14 to 16 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Broadhurst, Demar and Grummit soils. The Broadhurst soils are on adjacent nearly level to gently sloping fans and terraces. They have very firm consistence and when dry have cracks 1/2 to 1 inch wide and several feet long extending downward through the solum. Demar soils have argillic horizons and are on nearly level to gently sloping terraces and fans. Grummit soils are on moderately sloping to steeply sloping uplands. They have bedded shale within depths of 20 inches.

DRAINAGE AND PERMEABILITY: Well drained. Runoff is low or medium depending on slope. Permeability is moderate.

USE AND VEGETATION: These soils are used primarily as native rangeland. Native vegetation is prairie sandreed, little bluestem, sand bluestem and western wheatgrass.

DISTRIBUTION AND EXTENT: Western South Dakota. The series is of small extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Butte County, South Dakota, 1970.

REMARKS: Diagnostic horizons and features recognized in this pedon: ochric epipedon - the zone from the surface of the soil to a depth of 5 inches (A horizon). The soil has an Ustic moisture regime that borders on Aridic. The soil will be reclassified to the Torrertic subgroup when it is approved.

National Cooperative Soil Survey
U.S.A.

LOCATION GRUMMIT SD+MT WY

Established Series
Rev. KEC-CJH
10/97

GRUMMIT SERIES

The Grummit series consists of shallow, well drained soils formed in clayey residuum from acid shale on uplands. Permeability is moderate or moderately slow. Slopes range from 2 to 60 percent. Mean annual precipitation is about 15 inches, and mean annual temperature is about 46 degrees F.

TAXONOMIC CLASS: Clayey, smectitic, acid, mesic, shallow Aridic Ustorthents

TYPICAL PEDON: Grummit clay - on a convex slope of 5 percent in native grass. When described, the soil was moist to bedded shale. (Colors are for dry soil unless otherwise stated)

A--0 to 3 inches; light brownish gray (10YR 6/2) clay, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; loose, friable; many fine roots; many very fine fragments of shale; very strongly acid; clear smooth boundary. (2 to 6 inches thick)

C1--3 to 7 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; hard, friable; many fine roots; 25 percent very fine fragments of shale; extremely acid; gradual wavy boundary.

C2--7 to 17 inches; grayish brown (10YR 5/2) and gray (2.5Y 5/1) clay, dark grayish brown (10YR 4/2) and dark gray (2.5Y 4/1) moist; common distinct mottles of yellowish brown (10YR 5/6); weak coarse subangular blocky structure; hard, friable; partially weathered fragments of shale make up 35 percent by volume; common roots; extremely acid; clear smooth boundary.

Cr--17 to 40 inches; gray (10YR 6/1) brittle platy shale, dark gray (10YR 4/1) moist; common medium distinct stains of yellowish brown (10YR 5/8); very hard; extremely acid.

TYPE LOCATION: Butte County, South Dakota; about 4 miles west and 2 miles north of Belle Fourche; 200 feet east and 1800 feet north of the southwest corner of sec. 30, T. 9 N., R. 2 E.

RANGE IN CHARACTERISTICS: Depth to shale ranges from 10 to 20 inches. Colors throughout the soil are inherited from the shale. The horizons overlying the bedded shales typically average 50 to 65 percent clay but ranges from 35 to 65 percent clay. The low clay percentage is due to sand-size shale fragments. Consistence ranges from loose to hard when dry but is friable when moist. The soil ranges from strongly acid to extremely acid.

The A horizon has hue of 10YR or 2.5Y, value of 5 or 6 and 3 or 4 moist, and chroma of 1 or 2 dry or moist. It typically is clay but is clay loam in some pedons. It has weathered fragments of shale that make up 5 to 35 percent by volume. The A horizon contains less than 1 percent more organic matter than the C.

The C horizon has hue of 10YR, 2.5Y, or 5Y; value of 5 or 6 and 3 or 4 moist; and chroma of 1 or 2. Weathered fragments of shale make up 20 to over 50 percent by volume of the C horizon.

The fissile shale is very hard and brittle and will not disperse in water or in sodium hexametaphosphate.

COMPETING SERIES: There are no other soils in the same family. Other competing soils are the Dupree, Lismas, and Samsil series. Dupree soils are more moist and have firm to extremely firm consistence. Lismas soils are more alkaline and have a firmer consistence. Samsil soils contain carbonates and are alkaline.

GEOGRAPHIC SETTING: Grummit soils are gently sloping to very steep on uplands. Slope gradients range from 2 to 60 percent. The soil formed in clayey residuum weathered from acid shales. Mean annual temperature ranges from 43 to 50 degrees F, and mean annual precipitation is about 12 to 18 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Broadhurst, Graner, and Demar soils. All of these associated soils are deeper to bedded shale. The Broadhurst and Demar soils are on adjacent, nearly level to gently sloping fans and terraces. In addition, Demar soils have argillic horizons. Graner soils are on nearby undulating to rolling uplands. Grummit soils are also associated with rock outcrop.

DRAINAGE AND PERMEABILITY: Well drained. Runoff is slow or medium. Permeability is moderate or moderately slow in the upper part and moderate in the underlying material.

USE AND VEGETATION: These soils are used primarily as native rangeland. Native vegetation typically is little bluestem, western wheatgrass, green needlegrass, blue grama, sideoats grama, and needleandthread. Short, limby, ponderosa pine is on some places.

DISTRIBUTION AND EXTENT: Western South Dakota and eastern Wyoming. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Butte County, South Dakota, 1970.

REMARKS: Diagnostic horizons and features recognized in this pedon are: ochric epipedon - the zone from the surface of the soil to a depth of 3 inches (A horizon).

LOCATION HISLE SD+NE

Established Series
Rev. RER-WJB
10/97

HISLE SERIES

The Hisle series consists of moderately deep, well drained and moderately well drained soils formed in clayey sediments weathered from clay shale on uplands. Permeability is very slow. Slopes range from 0 to 15 percent. Mean annual precipitation is about 15 inches, and mean annual air temperature is about 45 degrees F.

TAXONOMIC CLASS: Fine, smectitic, mesic Leptic Torrertic Natrustalfs

TYPICAL PEDON: Hisle silt loam - on an east-facing plane slope of 3 percent in native grass at 3,020 feet elevation. When described the soil was moist below a depth of 2 inches. (Colors are for dry soil unless otherwise stated)

E--0 to 1 inch; light gray (10YR 7/2) silt loam, dark grayish brown (10YR 4/2) moist; weak very thin platy structure parting to weak fine granular; soft, very friable; surface crust about 1/8 inch thick; neutral; abrupt smooth boundary. (1 to 4 inches thick)

Btn1--1 to 2 inches; light brownish gray (2.5Y 6/2) clay, dark grayish brown (10YR 4/2) moist; moderate medium and fine columnar structure parting to strong medium blocky; very hard, firm, sticky and plastic; light gray (10YR 7/2) coatings on tops of columns; slightly alkaline; clear wavy boundary. (1 to 3 inches thick)

Btn2--2 to 9 inches; light brownish gray (2.5Y 6/2) clay, grayish brown (2.5Y 5/2) moist; weak medium prismatic structure parting to strong medium and fine blocky; very hard, firm, sticky and plastic; slight effervescence; strongly alkaline; gradual wavy boundary. (4 to 12 inches thick)

Btn3--9 to 13 inches; pale olive (5Y 6/3) clay, olive (5Y 5/3) moist; moderate medium and fine blocky structure; very hard, firm, sticky and plastic; slight effervescence; moderately alkaline; clear wavy boundary. (0 to 8 inches thick)

Bkz--13 to 20 inches; light gray (2.5Y 7/2) clay, olive (5Y 5/3) moist; few faint yellowish brown (10YR 5/6) mottles; weak medium and fine subangular blocky structure; very hard, firm, sticky and plastic; many small pebbles and fragments of shale; few fine dark concretions (Fe and Mn oxides); common fine threads and accumulations of carbonate and salt; strong effervescence; moderately alkaline; clear wavy boundary. (4 to 12 inches thick)

C--20 to 26 inches; gray (5Y 6/1) and light olive gray (5Y 6/2) clay, very dark gray (5Y 3/1) and olive gray (5Y 4/2) moist; common medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; fine earth is massive; hard, firm, sticky; 50 to 70 percent by

volume of fragments of shale; few fine accumulations of carbonate and salt; strong effervescence; moderately alkaline; clear wavy boundary.

Cr--26 to 60 inches; gray (5Y 5/1) fractured soft shale; dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) iron stains and mottles in the seams; slightly alkaline.

TYPE LOCATION: Shannon County, South Dakota; about 16 miles northwest of Oglala on Red Shirt Table road; 1,400 feet west and 400 feet north of southeast corner of sec. 2, T. 39 N., R. 47 W.

RANGE IN CHARACTERISTICS: The depth to bedded shale typically is about 20 to 26 inches and ranges from 20 to 40 inches. Colors of the soil commonly are inherited from the underlying shale. A few small pebbles are on the surface and mixed throughout the solum in some pedons.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 8 and 3 to 5 moist, and chroma of 1 to 3. It is silt loam or loam and ranges from slightly acid to slightly alkaline. When dry, the surface is crusted up to 1/8 inch thick.

The Btn horizon has hue of 10YR, 2.5Y, or 5Y, value of 5 to 7 and 4 to 6 moist, and chroma of 1 to 4. It is clay or silty clay averaging between 50 and 60 percent clay. It ranges from slighty to strongly alkaline. The Btn horizon has weak or moderate, fine to coarse columnar structure parting to moderate or strong, fine to coarse blocky structure in the upper part. Accumulations of salts and carbonates are in the lower Btn horizon of some pedons.

The Bkz horizon has hue of 10R to 5Y, value of 5 to 8 and 3 to 5 moist, and chroma of 1 to 4. It is silty clay or clay. It has few to many accumulations of carbonate and typically has accumulations of gypsum and salts. It ranges from slightly to strongly alkaline. It contains up to 15 percent fragments of shale by volume.

The C horizon has hue of 10R to 5Y, value of 5 to 8 and 3 to 5 moist, and chroma of 1 to 4. It is clay, or silty clay. Fragments of shale increase with depth and range up to 80 percent by volume. It ranges from slightly to strongly alkaline. Most pedons contain accumulations of carbonate and salts.

The Cr horizon is shale and hue of 10R to 5Y. It ranges from slightly acid to moderately alkaline.

COMPETING SERIES: These are the Arvada, Cedar Butte, Wanblee, and Winnett series. Arvada and Cedar Butte soils do not have bedded shale within depths of 40 inches. Wanblee soils contain less clay and formed in residuum weathered from soft siltstone. Winnett soils contain 30 to 50 percent clay and has an A horizon. Hurley soils have a mollic epipedon. Minatare soils are wetter.

GEOGRAPHIC SETTING: Hisle soils are nearly level to moderately sloping on uplands. Slope gradients range from 0 to 15 percent. Hisle soils formed in clays transported locally or weathered in place from clay shales. The

mean annual soil temperature ranges from 45 to 53 degrees F, and mean annual precipitation ranges from 12 to 16 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Kyle, Lismas, Pierre, Samsil, Swanboy, Twotop and Winler soils. Kyle, Pierre, Twotop and Winler soils do not have natric horizons and are on adjacent landscapes. Lismas and Samsil soils have shale within depths of 20 inches and are on steeper landscapes. Swanboy soils do not have a natric horizon and are on fans and terraces.

DRAINAGE AND PERMEABILITY: Well drained or moderately well drained. Surface runoff is medium to very high depending on slope. Permeability is very slow, but after dry periods initial intake commonly is rapid because of cracks.

USE AND VEGETATION: Used as rangeland. Western wheatgrass, blue grama, buffalograss, needleandthread and saltgrass are the main grass species.

DISTRIBUTION AND EXTENT: Western South Dakota and possibly eastern Wyoming and northwestern Nebraska. The series is of moderate extent.

MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: Denver, Colorado

SERIES ESTABLISHED: Butte County, South Dakota, 1970.

REMARKS: Diagnostic horizon and features recognized in this pedon are: ochric horizon - 1 to 4 inches thick (E horizon); natric horizon - 5 to 20 inches thick (Btn1, Btn2, and Btn3 horizon).

National Cooperative Soil Survey
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APPENDIX C

Soil Laboratory Analysis

Pace Analytical® Formerly Inter-Mountain Laboratories
1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Date: 7/15/2021

CLIENT: Bentonite Performance Minerals, LLC
Project: SD Security Project soils
Lab Order: S2106359

CASE NARRATIVE

Report ID: S2106359001

Samples Soil 1, Soil 2, Soil 3, Soil 4, Soil 5, Soil 6, Soil 7 and Soil 8 were received on June 18, 2021.

Samples were analyzed using the methods outlined in the following references:

U.S.E.P.A. 600/2-78-054 "Field and Laboratory Methods Applicable to Overburden and Mining Soils", 1978
American Society of Agronomy, Number 9, Part 2, 1982
USDA Handbook 60 "Diagnosis and Improvement of Saline and Alkali Soils", 1969
Wyoming Department of Environmental Quality, Land Quality Division, Guideline No. 1, 1984
New Mexico Overburden and Soils Inventory and Handling Guideline, March 1987
State of Utah, Division of Oil, Gas, and Mining: Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining, April 1988
Montana Department of State Lands, Reclamation Division: Soil, Overburden, and Regraded Spoil Guidelines, December 1994
State of Nevada Modified Sobek Procedure
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All Quality Control parameters met the acceptance criteria defined by EPA and Pace Analytical (Formerly Inter-Mountain Laboratories) except as indicated in this case narrative.

Reviewed by: _____
Steve Kasa, Mining Lab Supervisor

Pace Analytical® Formerly Inter-Mountain Laboratories
1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Soil Analysis Report

Bentonite Performance Minerals, LLC

554 U.S. HWY 212
Belle Fourche, SD 57717

Report ID: S2106359001

Project: SD Security Project soils
Date Received: 6/18/2021

Date Reported: 7/15/2021
Work Order: S2106359

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	Calcium PE	Magnesium PE	Sodium PE	SAR
		in.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	
S2106359-001	Soil 1	0-3	6.3	63.3	0.91	3.8	4.57	3.06	0.63	0.32
S2106359-002	Soil 1	3-16	5.4	63.0	2.67	1.2	12.7	11.2	3.97	1.15
S2106359-003	Soil 1	16-30	6.4	62.0	6.04	0.8	45.2	34.9	14.7	2.32
S2106359-004	Soil 1	30-39	6.8	68.7	3.93	0.7	28.3	22.3	13.5	2.69
S2106359-005	Soil 1	39-53	4.8	60.4	4.23	0.4	26.6	22.1	14.5	2.94
S2106359-006	Soil 1	53-60	6.4	59.9	3.83	0.3	26.5	19.1	12.8	2.68
S2106359-007	Soil 2	0-2	6.9	76.5	1.28	5.3	6.38	3.72	1.86	0.83
S2106359-008	Soil 2	2-8	7.2	76.7	1.45	1.2	5.54	3.59	4.89	2.29
S2106359-009	Soil 2	8-15	6.1	67.6	2.89	0.8	14.5	9.89	15.3	4.37
S2106359-010	Soil 2	15-34	3.9	50.6	3.22	0.5	8.09	6.89	18.9	6.92
S2106359-011	Soil 3	0-3	7.0	73.3	1.26	4.5	7.26	3.15	1.25	0.55
S2106359-012	Soil 3	3-17	6.5	69.7	3.20	0.8	26.5	11.5	5.96	1.37
S2106359-013	Soil 3	17-23	7.1	138	4.60	0.4	20.7	23.0	31.8	6.79
S2106359-014	Soil 3	23-42	6.6	104	7.65	0.5	17.9	21.4	90.7	20.5
S2106359-015	Soil 3	42-55	6.5	126	9.05	0.3	15.5	38.6	101	19.5
S2106359-016	Soil 3	55-68	6.8	150	9.41	0.4	17.7	49.7	109	18.8
S2106359-017	Soil 4	0-2	7.4	78.9	0.45	0.8	2.69	1.33	1.07	0.75
S2106359-018	Soil 4	2-12	7.0	69.4	1.25	1.1	6.46	3.63	2.71	1.21
S2106359-019	Soil 4	12-24	6.9	65.3	4.68	1.0	31.5	21.5	17.7	3.43
S2106359-020	Soil 4	24-41	4.6	48.6	5.57	0.7	29.7	26.0	32.7	6.20

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: _____
Steve Kasa, Mining Lab Supervisor

Pace Analytical® Formerly Inter-Mountain Laboratories
1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Soil Analysis Report

Bentonite Performance Minerals, LLC

554 U.S. HWY 212
Belle Fourche, SD 57717

Report ID: S2106359001

Project: SD Security Project soils
Date Received: 6/18/2021

Date Reported: 7/15/2021
Work Order: S2106359

Lab ID	Sample ID	Depths	pH	Saturation	Electrical Conductivity	Organic Matter	Calcium PE	Magnesium PE	Sodium PE	SAR
		in.	s.u.	%	dS/m	%	meq/L	meq/L	meq/L	
S2106359-021	Soil 4	41-48	4.4	51.4	2.73	0.7	5.80	6.17	22.4	9.15
S2106359-022	Soil 5	0-3	7.1	68.9	1.08	3.6	4.96	2.38	3.71	1.94
S2106359-023	Soil 5	3-19	6.2	72.7	2.42	1.4	8.89	6.00	11.8	4.34
S2106359-024	Soil 5	19-35	5.4	70.8	2.93	0.8	14.5	10.7	10.7	3.02
S2106359-025	Soil 5	35-52	4.7	66.5	4.12	0.5	28.4	19.2	10.4	2.13
S2106359-026	Soil 6	0-5	6.4	35.7	0.60	2.1	1.03	0.68	4.34	4.69
S2106359-027	Soil 6	5-15	7.5	86.1	2.64	1.1	3.90	3.65	26.8	13.8
S2106359-028	Soil 6	15-27	6.3	81.4	4.63	0.5	16.2	13.7	37.2	9.61
S2106359-029	Soil 6	27-53	5.3	83.9	4.27	0.7	8.95	8.85	42.9	14.4
S2106359-030	Soil 7	0-4	5.6	82.2	1.78	3.2	3.46	2.92	15.7	8.80
S2106359-031	Soil 7	4-14	5.9	90.7	3.06	1.2	7.14	5.41	27.8	11.1
S2106359-032	Soil 7	14-28	5.9	73.7	5.37	0.8	18.2	16.0	50.7	12.3
S2106359-033	Soil 7	28-38	5.8	71.7	7.33	0.8	15.6	33.2	78.8	16.0
S2106359-034	Soil 7	38-70	5.6	88.5	9.70	0.7	16.9	47.4	104	18.4
S2106359-035	Soil 8	0-6	5.1	63.5	0.78	2.8	3.10	2.00	0.88	0.55
S2106359-036	Soil 8	6-22	3.6	52.3	1.03	0.9	4.21	2.73	1.23	0.66
S2106359-037	Soil 8	22-53	3.7	51.2	0.39	0.6	0.87	0.61	1.50	1.74

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: _____
Steve Kasa, Mining Lab Supervisor

Pace Analytical® Formerly Inter-Mountain Laboratories
1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Soil Analysis Report

Bentonite Performance Minerals, LLC

554 U.S. HWY 212
Belle Fourche, SD 57717

Report ID: S2106359001

Project: SD Security Project soils
Date Received: 6/18/2021

Date Reported: 7/15/2021
Work Order: S2106359

Lab ID	Sample ID	Depths in.	Sand %	Silt %	Clay %	Texture	Coarse Fragment %	Boron ppm	Selenium ppm
S2106359-001	Soil 1	0-3	23.0	41.0	36.0	Clay Loam	3.7	0.40	<0.02
S2106359-002	Soil 1	3-16	9.0	30.0	61.0	Clay	0.4	0.90	<0.02
S2106359-003	Soil 1	16-30	11.0	29.0	60.0	Clay	0.3	2.66	0.04
S2106359-004	Soil 1	30-39	12.0	29.0	59.0	Silty Clay	<0.1	2.36	0.11
S2106359-005	Soil 1	39-53	3.0	41.0	56.0	Clay	0.4	1.28	0.17
S2106359-006	Soil 1	53-60	18.0	33.0	49.0	Clay	10.2	1.22	0.16
S2106359-007	Soil 2	0-2	23.0	35.0	42.0	Clay	4.4	1.22	<0.02
S2106359-008	Soil 2	2-8	13.0	34.0	53.0	Clay	4.0	1.15	<0.02
S2106359-009	Soil 2	8-15	5.0	42.0	53.0	Silty Clay	0.2	1.37	<0.02
S2106359-010	Soil 2	15-34	1.0	52.0	47.0	Silty Clay	<0.1	0.69	<0.02
S2106359-011	Soil 3	0-3	24.0	32.0	44.0	Clay	4.0	0.69	<0.02
S2106359-012	Soil 3	3-17	15.0	34.0	51.0	Clay	4.4	0.79	<0.02
S2106359-013	Soil 3	17-23	22.0	24.0	54.0	Clay	<0.1	0.85	<0.02
S2106359-014	Soil 3	23-42	1.0	43.0	56.0	Clay	<0.1	0.59	0.04
S2106359-015	Soil 3	42-55	5.0	31.0	64.0	Clay	<0.1	2.06	0.13
S2106359-016	Soil 3	55-68	10.0	8.0	82.0	Clay	<0.1	1.52	0.17
S2106359-017	Soil 4	0-2	10.0	31.0	59.0	Silty Clay	1.3	0.93	<0.02
S2106359-018	Soil 4	2-12	14.0	31.0	55.0	Silty Clay	0.9	1.49	<0.02
S2106359-019	Soil 4	12-24	5.0	38.0	57.0	Silty Clay	<0.1	4.55	0.05
S2106359-020	Soil 4	24-41	6.0	47.0	47.0	Silty Clay	3.3	2.77	0.07

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: _____
Steve Kasa, Mining Lab Supervisor

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1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

Soil Analysis Report

Bentonite Performance Minerals, LLC

554 U.S. HWY 212
Belle Fourche, SD 57717

Report ID: S2106359001

Project: SD Security Project soils
Date Received: 6/18/2021

Date Reported: 7/15/2021
Work Order: S2106359

Lab ID	Sample ID	Depths in.	Sand %	Silt %	Clay %	Texture	Coarse Fragment %	Boron ppm	Selenium ppm
S2106359-021	Soil 4	41-48	<0.1	46.0	54.0	Silty Clay	<0.1	1.63	0.06
S2106359-022	Soil 5	0-3	20.0	33.0	47.0	Clay	1.6	0.53	<0.02
S2106359-023	Soil 5	3-19	9.0	30.0	61.0	Clay	0.3	0.82	<0.02
S2106359-024	Soil 5	19-35	8.0	29.0	63.0	Clay	0.2	1.94	<0.02
S2106359-025	Soil 5	35-52	6.0	33.0	61.0	Clay	<0.1	1.48	<0.02
S2106359-026	Soil 6	0-5	35.0	44.0	21.0	Loam	4.0	0.35	<0.02
S2106359-027	Soil 6	5-15	5.0	34.0	61.0	Clay	0.4	1.87	<0.02
S2106359-028	Soil 6	15-27	<0.1	44.0	56.0	Clay	0.9	1.55	0.08
S2106359-029	Soil 6	27-53	<0.1	44.0	56.0	Clay	6.0	1.13	0.22
S2106359-030	Soil 7	0-4	7.0	39.0	54.0	Clay	0.2	0.93	<0.02
S2106359-031	Soil 7	4-14	19.0	32.0	49.0	Clay	0.6	1.08	<0.02
S2106359-032	Soil 7	14-28	27.0	25.0	48.0	Clay	<0.1	1.79	<0.02
S2106359-033	Soil 7	28-38	25.0	5.0	70.0	Clay	0.3	2.94	0.06
S2106359-034	Soil 7	38-70	21.0	26.0	53.0	Clay	0.3	3.53	0.15
S2106359-035	Soil 8	0-6	20.0	31.0	49.0	Clay	0.2	0.50	<0.02
S2106359-036	Soil 8	6-22	10.0	31.0	59.0	Silty Clay	<0.1	0.28	<0.02
S2106359-037	Soil 8	22-53	13.0	32.0	55.0	Silty Clay	0.1	0.31	<0.02

These results apply only to the samples tested.

Abbreviations for extractants: PE= Saturated Paste Extract, H20Sol= water soluble,AB-DTPA= Ammonium Bicarbonate-DTPA, AAO= Acid Ammonium Oxalate
Abbreviations used in acid base accounting: T.S.= Total Sulfur, AB= Acid Base, ABP= Acid Base Potential, PyrS= Pyritic Sulfur, Pyr+Org= Pyritic Sulfur + Organic Sulfur, Neutral. Pot.= Neutralization Potential
Miscellaneous Abbreviations: SAR= Sodium Adsorption Ratio, CEC= Cation Exchange Capacity, ESP= Exchangeable Sodium Percentage, TOC=Total Organic Carbon

Reviewed by: _____
Steve Kasa, Mining Lab Supervisor

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1673 Terra Avenue Sheridan, WY 82801 ph: (307) 672-8945

ANALYTICAL QC SUMMARY REPORT

CLIENT: Bentonite Performance Minerals, LLC **Date:** 7/15/2021
Work Order: S2106359 **Report ID:** S2106359001
Project: SD Security Project soils

Calcium Chloride Boron/Selenium Sample Type **MBLK** Units: ppm

CACL BLK (07/08/21 14:07) RunNo: 191014							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Boron	ND	0.05					
Selenium	ND	0.02					

Calcium Chloride Boron/Selenium Sample Type **LCS** Units: ppm

CACL QC (07/08/21 14:05) RunNo: 191014							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Boron	0.45	0.05	0.57		79.1	50 - 150	
Selenium	0.09	0.02	0.09		105	70 - 130	

Calcium Chloride Boron/Selenium Sample Type **DUP** Units: ppm

S2106359-009AD (07/08/21 12:38) RunNo: 191014							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Boron	1.06	0.05	1.37	25.8		62.9	
Selenium	ND	0.02	ND			20	
S2106359-019AD (07/08/21 13:11) RunNo: 191014							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Boron	4.32	0.05	4.55	5.20		62.9	
Selenium	0.03	0.02	0.05	54.5		20	R
S2106359-029AD (07/08/21 13:40) RunNo: 191014							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Boron	1.15	0.05	1.13	2.11		62.9	
Selenium	0.22	0.02	0.22	0.663		20	

Electrical Conductivity - Soil Sample Type **LCS** Units: dS/m

CONTROL (07/09/21 13:40) RunNo: 191057							
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Electrical Conductivity	3.42	0.01	4.05		84.4	80 - 120	

Electrical Conductivity - Soil Sample Type **DUP** Units: dS/m

S2106359-009A (07/09/21 13:09) RunNo: 191057							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Electrical Conductivity	1.79	0.01	2.89	47.0		20	R
S2106359-019A (07/09/21 13:20) RunNo: 191057							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Electrical Conductivity	4.29	0.01	4.68	8.70		20	
S2106359-029A (07/09/21 13:31) RunNo: 191057							
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Electrical Conductivity	4.68	0.01	4.27	9.16		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Report limit raised due to dilution
E	Value above quantitation range	G	Analyzed at IML Gillette laboratory
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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ANALYTICAL QC SUMMARY REPORT

CLIENT: Bentonite Performance Minerals, LLC **Date:** 7/15/2021
Work Order: S2106359 **Report ID:** S2106359001
Project: SD Security Project soils

Soil Texture Analysis Sample Type **LCS** Units: %

CONTROL (07/08/21 08:40)	RunNo: 191024						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Sand	28.0	0.1	32.5		86.2	75 - 125	
Silt	43.0	0.1	40.2		107	75 - 125	
Clay	29.0	0.1	27.2		107	75 - 125	
Texture	Clay Loam	0					

Soil Texture Analysis Sample Type **DUP** Units: %

S2106359-009A (07/08/21 08:09)	RunNo: 191024						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Sand	4.0	0.1	5.0	22.2		23.9	
Silt	45.0	0.1	42.0	6.90		20	
Clay	51.0	0.1	53.0	3.85		20	
Texture	Silty Clay	0	ND			0	

S2106359-019A (07/08/21 08:20)	RunNo: 191024						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Sand	6.0	0.1	5.0	18.2		23.9	
Silt	38.0	0.1	38.0	0		20	
Clay	56.0	0.1	57.0	1.77		20	
Texture	Silty Clay	0	ND			0	

S2106359-029A (07/08/21 08:31)	RunNo: 191024						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Sand	ND	0.1	ND			23.9	
Silt	44.0	0.1	44.0	0		20	
Clay	56.0	0.1	56.0	0		20	
Texture	Clay	0	ND			0	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Report limit raised due to dilution
E	Value above quantitation range	G	Analyzed at IML Gillette laboratory
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
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S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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ANALYTICAL QC SUMMARY REPORT

CLIENT: Bentonite Performance Minerals, LLC **Date:** 7/15/2021
Work Order: S2106359 **Report ID:** S2106359001
Project: SD Security Project soils

Organic Matter Sample Type **LCS** Units: %

CONTROL (07/08/21 14:45)	RunNo: 191010						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Organic Matter	2.1	0.1	2.75		75.6	32.7 - 167.3	

Organic Matter Sample Type **DUP** Units: %

S2106359-009A (07/08/21 14:55)	RunNo: 191010						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Organic Matter	0.6	0.1	0.8	26.1		67.3	

S2106359-019A (07/08/21 15:06)	RunNo: 191010						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Organic Matter	0.7	0.1	1.0	27.5		67.3	

S2106359-029A (07/08/21 15:17)	RunNo: 191010						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Organic Matter	0.6	0.1	0.7	21.5		67.3	

pH-Soil Sample Type **LCS** Units: s.u.

CONTROL (07/08/21 15:40)	RunNo: 191030						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
pH	7.1	0.1	7.1		99.6	96 - 104	

pH-Soil Sample Type **DUP** Units: s.u.

S2106359-009A (07/08/21 15:09)	RunNo: 191030						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
pH	6.2	0.1	6.1	0.972		20	

S2106359-019A (07/08/21 15:20)	RunNo: 191030						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
pH	6.9	0.1	6.9	0		20	

S2106359-029A (07/08/21 15:31)	RunNo: 191030						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
pH	5.2	0.1	5.3	1.15		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Report limit raised due to dilution
E	Value above quantitation range	G	Analyzed at IML Gillette laboratory
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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ANALYTICAL QC SUMMARY REPORT

CLIENT: Bentonite Performance Minerals, LLC **Date:** 7/15/2021
Work Order: S2106359 **Report ID:** S2106359001
Project: SD Security Project soils

Saturated Paste Cations by EPA 200.7 Sample Type **MBLK** Units: meq/L

SAR BLK (07/12/21 17:06)	RunNo: 191115						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	ND	0.05					
Magnesium	ND	0.05					
Sodium	ND	0.05					

SAR BLK (07/14/21 00:54)	RunNo: 191196						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	ND	0.05					
Magnesium	ND	0.05					
Sodium	ND	0.05					

Saturated Paste Cations by EPA 200.7 Sample Type **LCS** Units: meq/L

SAR QC (07/12/21 16:50)	RunNo: 191115						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	22.8	0.05	26		87.5	80 - 120	
Magnesium	13.1	0.05	13.4		98.0	80 - 120	
Sodium	17.6	0.05	17.2		103	80 - 120	

SAR QC1 (07/12/21 16:57)	RunNo: 191115						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	20.7	0.05	26		79.6	80 - 120	S
Magnesium	11.7	0.05	13.4		87.4	80 - 120	
Sodium	15.4	0.05	17.2		89.6	80 - 120	

SAR QC2 (07/12/21 16:59)	RunNo: 191115						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	23.4	0.05	26		89.8	80 - 120	
Magnesium	13.1	0.05	13.4		97.5	80 - 120	
Sodium	17.4	0.05	17.2		101	80 - 120	

SAR QC3 (07/12/21 17:01)	RunNo: 191115						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	24.1	0.05	26		92.7	80 - 120	
Magnesium	13.7	0.05	13.4		102	80 - 120	
Sodium	18.0	0.05	17.2		105	80 - 120	

SAR QC4 (07/12/21 17:03)	RunNo: 191115						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	22.8	0.05	26		87.5	80 - 120	
Magnesium	12.6	0.05	13.4		94.3	80 - 120	
Sodium	15.8	0.05	17.2		92.2	80 - 120	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Report limit raised due to dilution
E	Value above quantitation range	G	Analyzed at IML Gillette laboratory
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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ANALYTICAL QC SUMMARY REPORT

CLIENT: Bentonite Performance Minerals, LLC **Date:** 7/15/2021
Work Order: S2106359 **Report ID:** S2106359001
Project: SD Security Project soils

Saturated Paste Cations by EPA 200.7 Sample Type **LCS** Units: meq/L

SAR QC (07/14/21 00:52)	RunNo: 191196						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	22.6	0.05	26		86.8	80 - 120	
Magnesium	12.4	0.05	13.4		92.8	80 - 120	
Sodium	16.0	0.05	17.2		93.3	80 - 120	

Saturated Paste Cations by EPA 200.7 Sample Type **MS** Units: meq/L

S2106359-001AS (07/12/21 15:04)	RunNo: 191115						
Analyte	Result	RL	Spike	Ref Samp	%REC	% Rec Limits	Qual
Calcium	6.98	0.05	15.1	4.57	15.9	70 - 130	S
Magnesium	7.80	0.05	24.9	3.06	19.0	70 - 130	S
Sodium	3.07	0.05	13.2	0.63	18.6	70 - 130	S

Saturated Paste Cations by EPA 200.7 Sample Type **DUP** Units: meq/L

S2106359-009AD (07/12/21 15:28)	RunNo: 191115						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Calcium	6.65	0.05	14.5	74.4		20	R
Magnesium	4.55	0.05	9.89	74.0		20	R
Sodium	9.30	0.05	15.3	48.7		20	R

S2106359-019AD (07/12/21 15:57)	RunNo: 191115						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Calcium	28.6	0.05	31.5	9.58		20	
Magnesium	19.6	0.05	21.5	9.45		20	
Sodium	16.2	0.05	17.7	8.85		20	

S2106359-029AD (07/12/21 16:30)	RunNo: 191115						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Calcium	11.9	0.05	8.95	28.5		20	R
Magnesium	11.2	0.05	8.85	23.6		20	R
Sodium	44.2	0.05	42.9	2.98		20	

Saturation Percent Sample Type **DUP** Units: %

S2106359-009A (07/09/21 08:39)	RunNo: 191082						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Saturation Percent	65.0	0.1	67.6	4.02		20	

S2106359-019A (07/09/21 08:50)	RunNo: 191082						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Saturation Percent	64.7	0.1	65.3	0.941		20	

S2106359-029A (07/09/21 09:01)	RunNo: 191082						
Analyte	Result	RL	Ref Samp	%RPD	%REC	% RPD Limits	Qual
Saturation Percent	75.8	0.1	83.9	10.2		20	

Qualifiers:

B	Analyte detected in the associated Method Blank	D	Report limit raised due to dilution
E	Value above quantitation range	G	Analyzed at IML Gillette laboratory
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
L	Analyzed by another laboratory	ND	Not Detected at the Reporting Limit
O	Outside the Range of Dilutions	R	RPD outside accepted recovery limits
S	Spike Recovery outside accepted recovery limits	X	Matrix Effect

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Sheridan, WY and Gillette, WY

- CHAIN OF CUSTODY RECORD -

Page 1 of 1

All shaded fields must be completed.
This is a legal document: any misrepresentation may be construed as fraud.

190638

Client Name	Project Identification	Sampler (Signature/Attestation of Authenticity)	Telephone #
Bentonite Performance Minerals	50 Security Project Soils		

Report Address	Contact Name	Email	Phone
on File	Michael Barr		

Invoice Address	Purchase Order #	Quote #
on File		

ANALYSES / PARAMETERS

ITEM	LAB ID (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	SAMPLE IDENTIFICATION	Matrix	# of Containers	Guideline IA Attachment B1	PA EC SAR	SAR% MA OM	Se B	Coarse Frag	REMARKS
1		6/16/21	—	Soil 1 0-3", 3-16", 16-30", 30-39", 39-53", 53-60"	SL	6	X					
2		↓	↓	2 0-2", 2-8", 8-15", 15-34"	↓	4	↓					
3				3 0-3", 3-17", 17-23", 23-42", 42-55", 55-68"		6						
4				4 0-2", 2-12", 12-24", 24-41", 41-48"		5						
5		6/17/21		5 0-3", 3-19", 19-35", 35-52"		4						
6				6 0-5", 5-15", 15-22", 27-53"		4						
7				7 0-4", 4-14", 14-28", 28-38", 38-70"		5						
8		↓	↓	8 0-6", 6-22", 22-53"	↓	3	↓					
9												
10												
11												
12												
13												
14												

Please cc Chris Johnston on results.

LAB COMMENTS	Relinquished By (Signature/Printed)	DATE	TIME	Received By (Signature/Printed)	DATE	TIME
	Chris Johnston	6/18/21	1225		6/18/21	12:30

SHIPPING INFO	MATRIX CODES		TURNAROUND TIMES	COMPLIANCE INFORMATION	ADDITIONAL REMARKS
☐ UPS	Water	WT	Check desired service	Compliance Monitoring? Y / N	
☐ Fed Express	Soil	SL	☒ Standard turnaround	Program (SDWA, NPDES,...)	
☐ US Mail	Solid	SD	☐ **RUSH - 5 Working Days**	PWSID / Permit #	
☒ Hand Carried	Filter	FT	☐ **URGENT** - < 2 Working Days	Chlorinated? Y / N	
☐ Other ____	Other	OT	***Rush & Urgent Surcharges will be applie***	Sample Disposal: Lab / Client	

APPENDIX D

Photographs



Figure D-1. Soil-1 soil profile.



Figure D-2. Soil-1 soil profile cont'd.

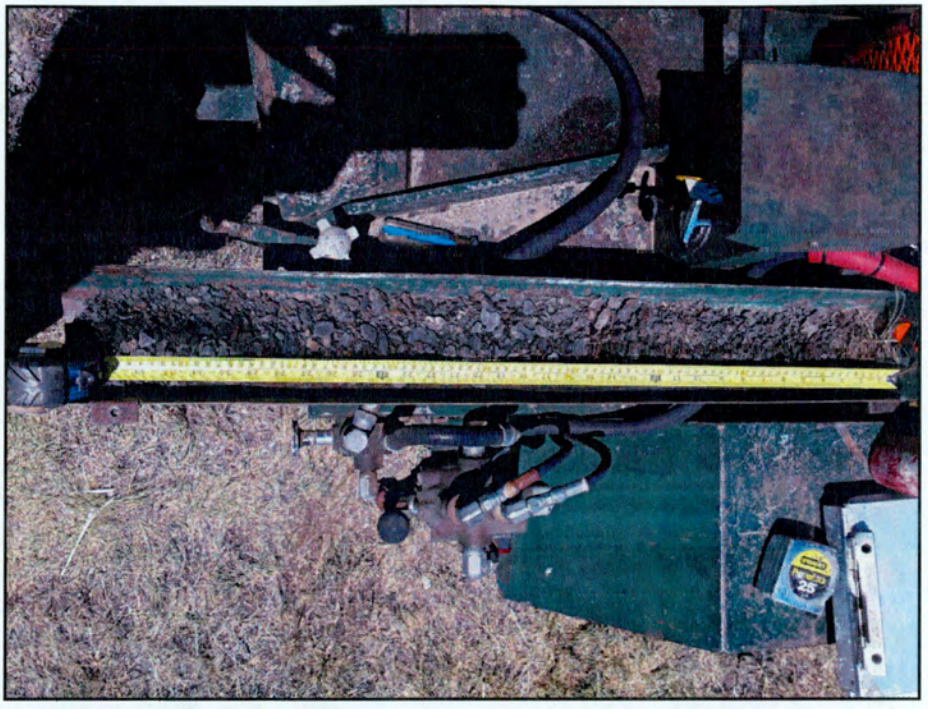


Figure D-3. Soil-2 soil profile.



Figure D-4. Soil-3 soil profile.

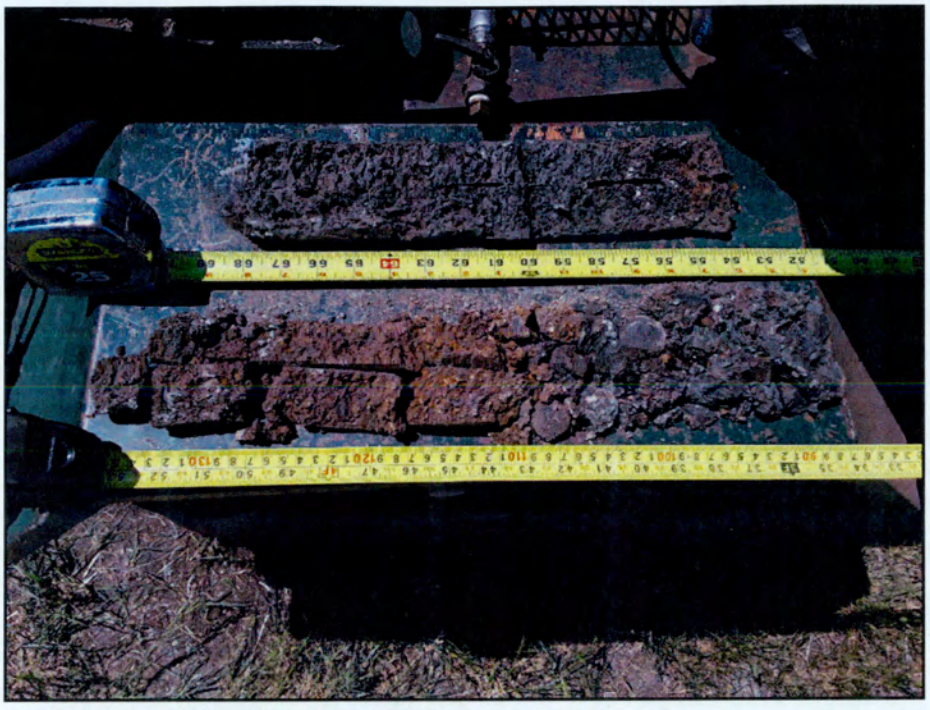


Figure D-5. Soil-3 soil profile cont'd.



Figure D-6. Soil-4 soil profile.



Figure D-7. Soil-4 soil profile cont'd.



Figure D-8. Soil-5 soil profile.



Figure D-9. Soil-5 soil profile cont'd.

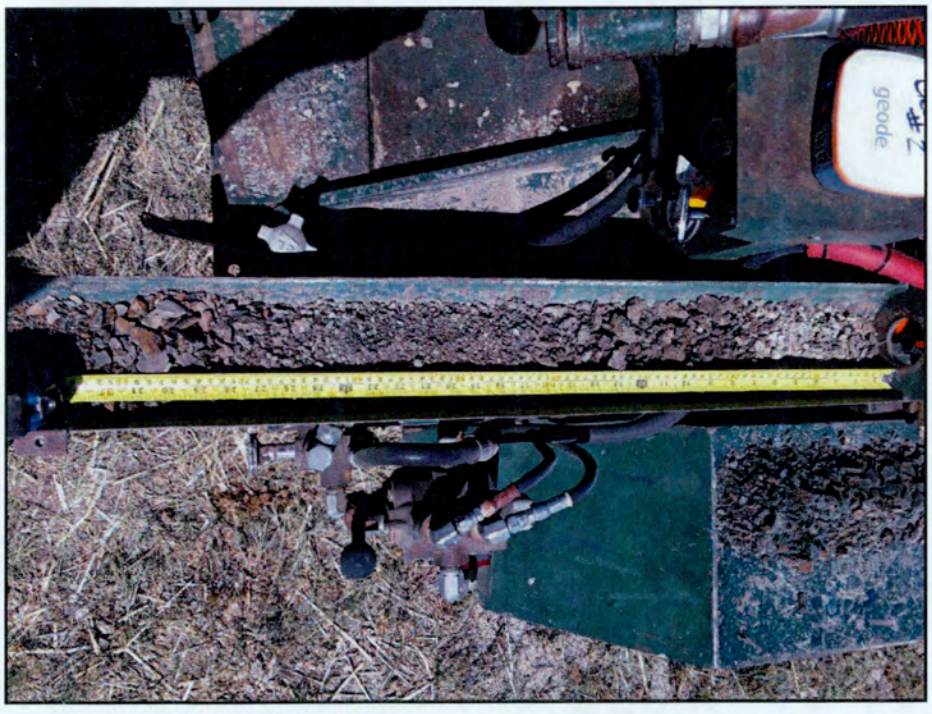


Figure D-10. Soil-6 soil profile.

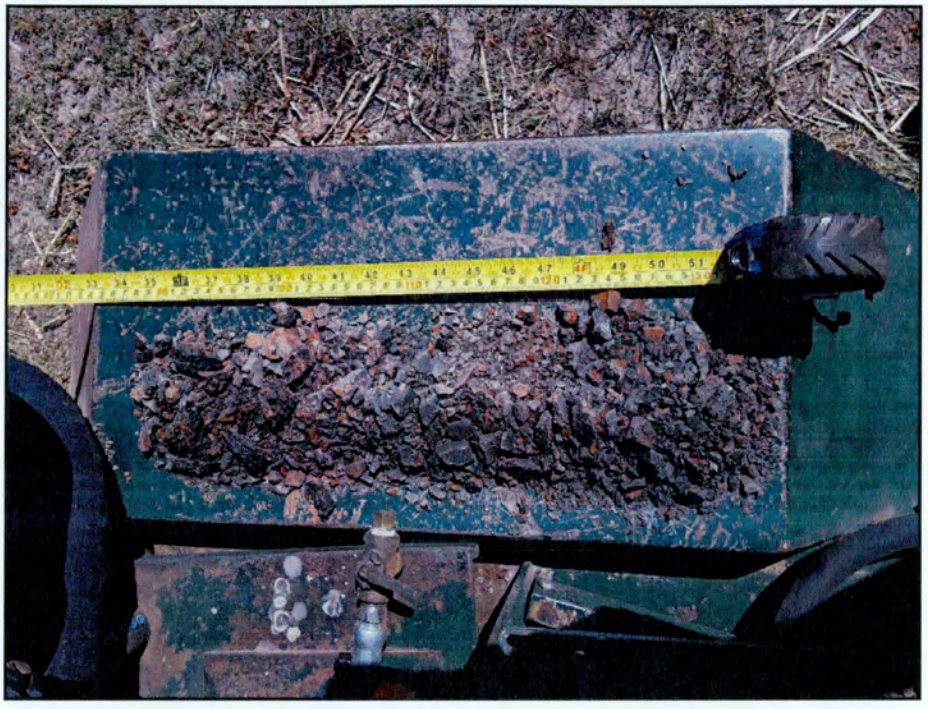


Figure D-11. Soil-6 soil profile cont'd.



Figure D-12. Soil-7 soil profile.



Figure D-13. Soil-7 soil profile cont'd.



Figure D-14. Soil-8 soil profile.



Figure D-15. Soil-8 soil profile cont'd.

Appendix E

Field Soil Profile Descriptions

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Soil Profile Description

Hole #: Soil-1 Sample Date: 6 / 16 / 21 Sampled By:

Client ID: BPM

Parent Material (ALL, COL, RES, EOL):

Analytical Sample: Yes ☒ No ☐

Physiography:

Weather: Sunny/overcast, wind 10-15 MPH

Vegetation: Perennial grasses Land Cover/Use: Rangeland, Hay yard

Slope (%): 0-5% Aspect: ~~E~~ NE

Erosion: Hillslope Profile Position (SU, SH, BS, FS, TS):

Additional Notes:

Bridwell

Depth (cm) (in) (ft)	Horizon	Matrix Color			Texture	Structure	Effervescence	Rock Frags		Mottles		Comments
		Name	Dry	Moist	(s, si, c, l)	gr, abk, sbk, pl, pr, cpr, sg, m	(NE, VS, SL, ST, VE)	Size (f, m, c)	Rnd (VA, A, R)	Size (f, m, c)	% (f, c, m)	
0-3	E			10YR 4/2	l/cl	wpl	NE	-	-	-	-	
3-16	Bt			"	cl/c	sbk	NE	-	-	-	-	
16-30	Btk			"	c	sbk	SL	-	-	c	f	$CaCO_3$ masses
30-39	B2			"	cl/c	m	NE	-	-	m/c	c	gypsum masses
39-53	C			"	cl/c	m	NE	-	-			
53→	C			10YR 4/6	c	m	NE	-	-			

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Soil Profile Description

Hole #: Soil 4 2-2 Sample Date: 6/16/21 Sampled By: S

Client ID: BPM

Parent Material (ALL, COL, RES, EOL): Analytical Sample: Yes ☒ No ☐

Physiography:

Weather:

Vegetation: Native grasses Land Cover/Use:

Slope (%): 0-5% Aspect: NW

Erosion: Hillslope Profile Position (SU, SH, BS, FS, TS):

Additional Notes: Grumosit - shale land

Depth (cm) (in) (ft)	Horizon	Matrix Color			Texture	Structure	Effervescence	Rock Frags		Mottles		Comments
		Name	Dry	Moist	(s, si, c, l)	gr, abk, sbk, pl, pr, cpr, sg, m	(NE, VS, SL, ST, VE)	Size (f, m, c)	Rnd (VA, A, R)	Size (f, m, c)	% (f, c, m)	
0-2	A			10YR 4/2	c	gr	NE	F	A	-	-	shale Frags
2-8	C_1			"	c	gr/m	NE	m	VA/A	-	-	shale Frags
8-15	C_2			"	c	sbk/m	NE	m	VA/A	m	C	shale Frags Fe/Mg mott/Nod
15→34	C_r			10YR 4/1	c	sbk/m	NE	c	VA	-	-	PM shale Frags

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Soil Profile Description

Hole #: Soil 3 Sample Date: 6/16/21 Sampled By: E

Client ID: BPM

Parent Material (ALL, COL, RES, EOL): Analytical Sample: Yes ☒ No ☐

Physiography:

Weather: Hot!

Vegetation: native grasses Land Cover/Use:

Slope (%): 0-5% Aspect: NE

Erosion: Hillslope Profile Position (SU, SH, BS, FS, TS):

Additional Notes: Demar

Depth (cm) (in) (ft)	Horizon	Matrix Color			Texture (s, si, c, l)	Structure gr, abk, sbk, pl, pr, cpr, sg, m	Effervescence (NE, VS, SL, ST, VE)	Rock Frags		Mottles		Comments
		Name	Dry	Moist				Size (f, m, c)	Rnd (VA, A, R)	Size (f, m, c)	% (f, c, m)	
0-3	E			10YR 4/2	L/cl	gr/wpl	NE	-	-	-	-	
3-17	Bt1			10YR 4/2	cl/c	sbk	NE	-	-	-	-	
17-23	Bt2			10YR 4/2	c	sbk	NE	m	A/VA	m/c	m	many Fe Oxy mottles shale Frags
23-42	C1			10YR 4/2	c	sbk	NE	m/c	VA	c	f	Fe Oxy mottles (very few) shale Frags
42-55	Cr			10YR 4/2	c	sbk	NE	m/c	VA	c	c	gypsum mottles fe Oxy mottles shale Frags
55-68	Cr			10YR 4/2	c	sbk/m	NE	c	VA	c	c	gypsum mottles shale Frags

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Soil Profile Description

Hole #: Soil 4 Sample Date: 6/16/21 Sampled By: [illegible]

Client ID: BPM

Parent Material (ALL, COL, RES, EOL):

Analytical Sample: Yes ☒ No ☐

Physiography:

Weather:

Vegetation: Native grasses Land Cover/Use:

Slope (%): 5-10% Aspect: NE

Erosion: Hillslope Profile Position (SU, SH, BS, FS, TS):

Additional Notes:

Hisle

Depth (cm) (in) (ft)	Horizon	Matrix Color			Texture (s, si, c, l)	Structure gr, abk, sbk, pl, pr, cpr, sg, m	Effervescence (NE, VS, SL, ST, VE)	Rock Frags		Mottles		Comments
		Name	Dry	Moist				Size (f, m, c)	Rnd (VA, A, R)	Size (f, m, c)	% (f, c, m)	
0-2	E			10YR 4/2	cl	wpl	NE	-	-	-	-	
2-12	Bt			10YR 4/2	c	sbk	NE	-	-	-	-	
12-24	Btk			10YR 4/2	c	sbk	ST	F	A	F/m	C	$CaCO_3$ mottle transition to 7.5YR rust mottles
24-41	Btk/c			10YR 5/4	c	m	VS	m	A/VA			shale frags shale frags
41→48	Cr			10YR 3/1	c	m	NE	m	A/VA	m	C	Fe/Mn mottles, shale frags

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Soil Profile Description

Hole #: Soil 5 Sample Date: 6 / 17 / 21 Sampled By: S

Client ID: BPM

Parent Material (ALL, COL, RES, EOL): Analytical Sample: Yes ☒ No ☐

Physiography:

Weather: windy, windy

Vegetation: Native grasses Land Cover/Use:

Slope (%): Aspect: N

Erosion: Hillslope Profile Position (SU, SH, BS, FS, TS):

Additional Notes:

Bidman

Depth (cm) (in) (ft)	Horizon	Matrix Color Name	Matrix Color Dry	Matrix Color Moist	Texture (s, si, c, l)	Structure gr, abk, sbk, pl, pr, cpr, sg, m	Effervescence (NE, VS, SL, ST, VE)	Rock Frags Size (f, m, c)	Rock Frags Rnd (VA, A, R)	Mottles Size (f, m, c)	Mottles % (f, c, m)	Comments
0-3	E			10YR 4/2	cl	wpl	NE	—	—	-	—	
3-19	Bt			"	c	sbk	NE	—	—	-	—	
19-35	Btk			"	cl/c	sbk	SL	—	—	—	—	few fine CaCO3 nodules
35-52	Bk			10YR 6/3	cl	sbk	SL	—	—	F	F	CaCO3 nodules

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Soil Profile Description

Hole #: Soil 6 **Sample Date:** 6 / 17 / 21 **Sampled By:** S

Client ID: BPM

Parent Material (ALL, COL, RES, EOL):

Analytical Sample: Yes ☒ No ☐

Physiography:

Weather:

Vegetation: native grasses **Land Cover/Use:**

Slope (%): **Aspect:** N

Erosion: **Hillslope Profile Position** (SU, SH, BS, FS, TS):

Additional Notes:

Grummit

Depth (cm) (in) (ft)	Horizon	Matrix Color Name	Matrix Color Dry	Matrix Color Moist	Texture (s, si, c, l)	Structure gr, abk, sbk, pl, pr, cpr, sg, m	Effervescence (NE, VS, SL, ST, VE)	Rock Frags Size (f, m, c)	Rock Frags Rnd (VA, A, R)	Mottles Size (f, m, c)	Mottles % (f, c, m)	Comments
0-5	A/E		10YR 6/2	10YR 4/4	l	gr	NE	m/c	A/VA	–	–	Few frags
5-15	Bt/c			10YR 4/2	cl/c	gr	NE	f/m	A/VA	–	–	Few Frags
15-27	C			10YR 4/2	C	sbk	NE	m	A/VA	–	–	Shale Frags >50%
27-53	Cr			10YR 4/2	C	sbk/m	NE	c	A/VA	m/c	c	Fe/Oy mottles between shale layers

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Soil Profile Description

Hole #: Soil 7 Sample Date: 6/17/21 Sampled By: F

Client ID: BPM

Parent Material (ALL, COL, RES, EOL): Analytical Sample: Yes ☒ No ☐

Physiography:

Weather:

Vegetation: Native grasses Land Cover/Use: Range

Slope (%): 0-5% Aspect: N

Erosion: Hillslope Profile Position (SU, SH, BS, FS, TS):

Additional Notes:

Dana

Depth (cm) (in) (ft)	Horizon	Matrix Color			Texture (s, si, c, l)	Structure gr, abk, sbk, pl, pr, cpr, sg, m	Effervescence (NE, VS, SL, ST, VE)	Rock Frags		Mottles		Comments
		Name	Dry	Moist				Size (f, m, c)	Rnd (VA, A, R)	Size (f, m, c)	% (f, c, m)	
0-4	E			10YR 4/2	l/cl	gr/wpl	NE	—	—	—	—	
4-14	B_{t1}			10YR 4/2	c	sbk	NE	—	—	—	—	
14-28	B_{t2}			10YR 4/3	c	sbk	NE	—	—	—	—	
28-38	C_1			10YR 4/3	c	sbk	NE	—	—	m/c	c	gypsum nodules
38-70	C_2			10YR 4/2	c	m	NE	—	—	—	—	

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Soil Profile Description

Hole #: Soil 8 Sample Date: 6 / 17 / 21 Sampled By: E

Client ID: BPM

Parent Material (ALL, COL, RES, EOL): Analytical Sample: Yes ☒ No ☐

Physiography:

Weather:

Vegetation: Native grasses Land Cover/Use: Range

Slope (%): 5-10% Aspect: N

Erosion: Hillslope Profile Position (SU, SH, BS, FS, TS):

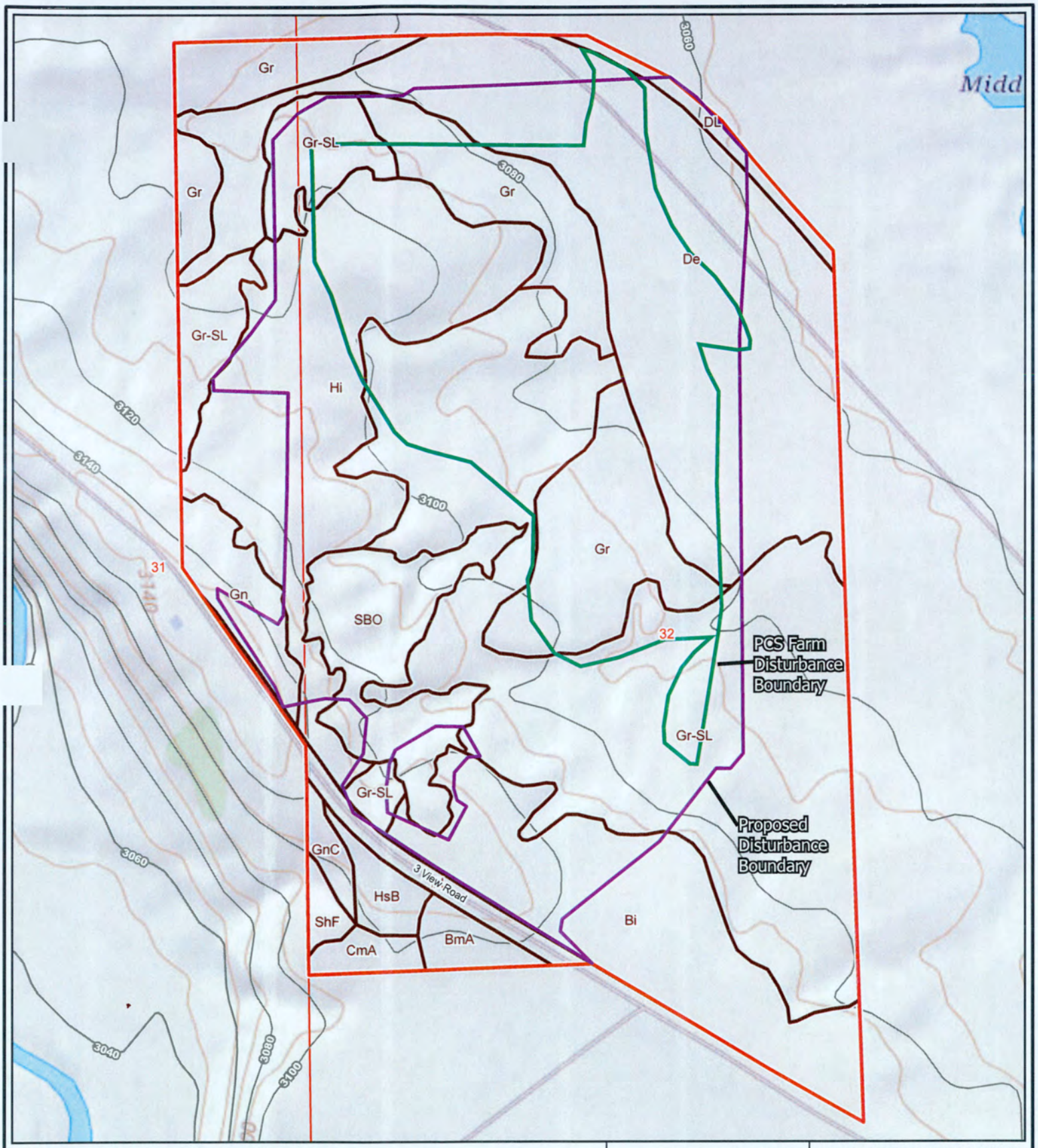
Additional Notes:

GRAVER

Depth (cm) (in) (ft)	Horizon	Matrix Color			Texture	Structure	Effervescence	Rock Frags		Mottles		Comments
		Name	Dry	Moist	(s, si, c, l)	gr, abk, sbk, pl, pr, cpr, sg, m	(NE, VS, SL, ST, VE)	Size (f, m, c)	Rnd (VA, A, R)	Size (f, m, c)	% (f, c, m)	
0-6	A			10YR 4/3	C	gr	NE	-	-	-	-	
6-22	C			10YR 4/3	C	gr-sbk	NE	F/m	A/VA	-	-	shale Frags
22-53	C			10YR 4/3	C	sbk	NE	F/m	A/VA	-	-	shale Frags

APPENDIX F

Map



Project Boundary
Section
Contour Interval 20 feet
Soil Map Units

Unit Name and Description

BmA, Bidman loam, 0 to 2% slopes
Bi, Bidman Loam, 0 to 6% slopes
CmA, Nunn loam, 0 to 2% slopes
DL, Disturbed Land
De, Demar Loam, 0 to 6% slopes
Gn, Graner Clay 3 to 25% slope
GnC,Graner clay, 3 to 25% slopes
Gr, Grummit Clay, 3 to 60% slopes
Gr-SL, Grummit - Shale Land, 6 to 20% slopes
Hi, Hisle Silt Loam, 0 to 15% slopes
HsB, Hisle-Slickspots complex, 0 to 6% slopes
SBO, Shale-Bentonite Outcrop
ShF, Grummit-Rock outcrop complex, 6 to 40% slopes

480

Butte County, South Dakota
USGS 7.5' Quadrangle:
Sourdough Flats, SD, 44103-F8
T9N, 2E, Sections 31 and 32
NAD 1983 UTM Zone 13N
103.9104°W 44.6982°N

Base Map: ESRI ArcGIS Online, accessed December 2022

Updated: 12/28/2022
Project No. 61279
File: Fig1_Soils

SOUTH DAKOTA HALLIBURTON BASELINE
BENTONITE PERFORMANCE MINERALS, LLC
BELLE FOURCHE, SOUTH DAKOTA 57717

Soil Survey, F-1

N

1:4,800
1 inch = 400 feet

South Dakota

0 200 400 Feet
0 50 100 Meters

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MINERALS & MINING PROGRAM

Baseline Vegetation Report

BPM Security Bentonite Mine

Baseline Vegetation Survey Results for Proposed Security Project, Butte County, South Dakota

JULY 2021

PREPARED FOR

Bentonite Performance Minerals, LLC

SUBMITTED TO

South Dakota Department of Agriculture and Natural Resources

PREPARED BY

SWCA Environmental Consultants

Baseline Vegetation Survey Results for Proposed Security Project, Butte County, South Dakota

Prepared for

Bentonite Performance Minerals, LLC
Belle Fourche, South Dakota 57717

Submitted to

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SWCA Project No. 61279

July 2021

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2.2 Species Diversity and Composition 2

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Table 2. Species Diversity and Composition *4*

Table 3. Plant Community Types in the Survey Area *5*

Table 4. State-Listed Threatened and Endangered Species in Butte County, South Dakota *8*

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1 INTRODUCTION

Bentonite Performance Minerals, LLC's (BPM's) proposed Security Bentonite Mine Project was surveyed for baseline vegetation information to be included in the South Dakota Department of Agriculture and Natural Resources permit application. The survey area is located approximately 3 miles northwest of Belle Fourche, South Dakota and encompasses 140.27 acres. Mine related disturbance will be limited to the area north of 3 View Road. There will be no mine related disturbance south of 3 View Road. Project area is located in Township 9 North, Range 2 East, Butte County, SD:

Section 31: SE4SE4NE4NE4, E2E2SE4NE4 and that portion of the E2E2NE4SE4 north of 3 View Road.

Section 32: SW4NW4, NW4SW4, W2W2NE4SW4, those portions of the S2S2NW4NW4, SW4NE4NW4, & W2W2SE4NW4 south of the ACC Haul Road and those portions of the W2W2SE4SW4 & NE4SW4SW4 north of 3 View Road.

SWCA Environmental Consultants (SWCA) biologists Paige Colburn and Corey McDonough conducted baseline vegetation surveys at the proposed survey area from May 25 to 27, 2021. Maddy McClure analyzed the collected data and prepared this report.

2 BASELINE VEGETATION SAMPLING METHODOLOGY

SWCA conducted baseline vegetation sampling to meet the requirements of South Dakota Codified Law 45-6B-7(3).

2.1 Cover Sampling

SWCA conducted cover sampling using line-point intercept transects and recorded the following parameters at each sample location:

- Percent vegetation by cover species
- Percent total vegetation cover (= sum of all species)
- Percent total ground cover (= vegetation + litter + rock)
- Percent bare ground
- Plant species observed

Transects were 50 meters (m) long, and each one encompassed a minimum of 50 sample points equally spaced at 1-m intervals. In addition, personnel

- randomly established the orientation of each transect;
- selected a new random orientation to fit within the boundary of the survey area if the original transect ran out of the area; and
- determined point samples using an ocular sighting device, such as a laser or crosshairs, or a sharpened rod(s) in a fixed frame projected vertically downward to the sample location on the transect.

For sampling purposes, rock may be considered any stone or mineral matter of at least 1 square centimeter. Litter is any plant part lying on the ground surface whose structural integrity remains

recognizable. SWCA also collected cover data for annual species and data regarding presence of noxious weeds.

2.1.1 Sample Point Selection

Prior to field sampling, SWCA's geographic information system (GIS) team randomly placed 20 vegetation transect locations throughout the survey area. Transect direction was selected between 1 and 360 degrees. Locations of the sample points are shown on Figure A-1 of Appendix A.

2.2 Species Diversity and Composition

SWCA compiled an inventory of all plant species observed (including incidental observations) within each monitoring unit. This work took place in accordance with the following requirements:

- Plant species are listed by life form, scientific binomial name, and common name and are identified as a species native or introduced to North America.

2.3 Tree Documentation

Based on initial review of aerial imagery, there appeared to be a small inclusion of trees in the southwest corner of the survey area, but due to the limited extent of these areas, they were not sampled as part of the baseline vegetation surveys.

3 RESULTS

Appendix A contains a map illustrating the location of survey area, sample points, and proposed reference area (Figure A-1). The reference area identified by SWCA was to ensure future reclamation success as outlined in Administrative Rules of South Dakota 74:29:07:06(3).

3.1.1 Cover Sampling Results

SWCA collected data from 20 cover transects. Table 1 summarizes the absolute vegetative cover data for the unit by life-form. Usually, cover transects involve 100 sample points. In this case, cover transects involved 50 sample points equally spaced at 1-m intervals, but statistically the data is extrapolated in terms of 100%. The associated cover data sheets show the data is doubled in order for the data to be considered statically viable. Figure 1 is a representative photograph taken during the survey. See Appendix B for cover monitoring data.



Figure 1. Representative photograph from surveys taken on May 25, 2021.

Table 1. Absolute Cover

Life-form/Feature	Absolute Cover (%)
Introduced annual grass	0.6
Native annual grass	–
Introduced perennial grass	20.0
Grass like	0.9
Native cool-season perennial grass	39.9
Native warm-season perennial grass	3.9
Annual/biennial forbs	1.6
Perennial forbs	3.7
Subshrubs	0.8
Shrubs	1.5
Succulents	0.1
Trees	–
Total creditable vegetation cover	**72.9**
Total vegetation cover	**73.0**
Cryptogams	0.2
Litter	9.0
Rock	0.2
Total ground cover	**82**
Bare ground	17.7

3.1.2 Species Diversity and Composition Results

SWCA collected data from 20 species diversity belt transects in the sample area. Table 2 summarizes this data. See Appendix B-2 for species diversity and composition monitoring data.

Table 2. Species Diversity and Composition

Life-form	Mean number of species per 50 m^2	Frequency (%)
Introduced annual grass	0.3	25
Native annual grass	–	–
Introduced perennial grass	1.5	80
Grass-like	0.2	15
Native cool season perennial grass	1.3	95
Native warm season perennial grass	0.5	45
Annual/biennial forb	0.5	35
Perennial forb	0.9	55
Subshrub	0.2	20
Shrub	0.2	20
Succulents	0.1	5
Trees	–	–
Total creditable species	**5.7**	**100**
Cryptogram	0.1	5

3.1.3 Sample Adequacy

SWCA made sample adequacy calculations according to *Handbook of Approved Sampling and Statistical Methods for Evaluation of Revegetation Success on Wyoming Coal Mines* (Wyoming Department of Environmental Quality 2012). Sample adequacy was met for the 20 transects sampled.

One-sample Sample Adequacy Formula

The formula for the number of samples required to ensure 90% confidence (α =0.10) that the sample mean will be within 10% (d) of the true mean is

$$n = \frac{(sz)^2}{(d\bar{x})^2}$$

Where

n is the number of sample points needed,

s is the sample standard deviation,

z is the critical value from the normal distribution with $\alpha/2$ in each tail (**1.645**),

d is the percentage of the sample mean that constitutes an acceptable difference between the sample mean and the true population mean (**0.10**), and

$\bar{x}$ is the sample mean.

3.1.4 Plant Community Types

SWCA completed a desktop review of the survey area to identify plant community types. The plant communities were then verified by field surveys. Table 3 identifies plant community types and acreages in the survey area.

Table 3. Plant Community Types in the Survey Area

National Vegetation Classification System Subclass	Acreage
Perennial graminoid grassland	91.90
Deciduous shrubland	0.57
Annual graminoid/forb	5.31
Mixed shrubland	41.90
Evergreen open tree canopy	0.59

During field surveys, SWCA verified the survey area was primarily dominated by native cool season perennial grasses such as western wheatgrass (*Pascopyrum smithii*), squirreltail (*Elymus elymoides)*, and Sandberg bluegrass (*Poa secunda).* This perennial graminoid grassland community (see Table 3) comprises 91.90 acres of the project area. Cover of subshrubs such as Gardner's saltbush (*Atriplex gardneri*), white sagebrush (*Artemisia ludoviciana*), and broom snakeweed (*Gutierrezia sarothrae*), and shrubs such as big sagebrush (*Artemisia tridentata*) and rubber rabbitbrush (*Ericameria nauseosa*) combined total of 41.90 acres of the project area. As noted in Section 2.3, there appeared to be a small inclusion of trees in the southwest corner of the survey area, but due to the limited extent of these areas, they were not sampled as part of the baseline vegetation surveys. Figures 2 to 4 are representative photographs of the community types present in the project area.

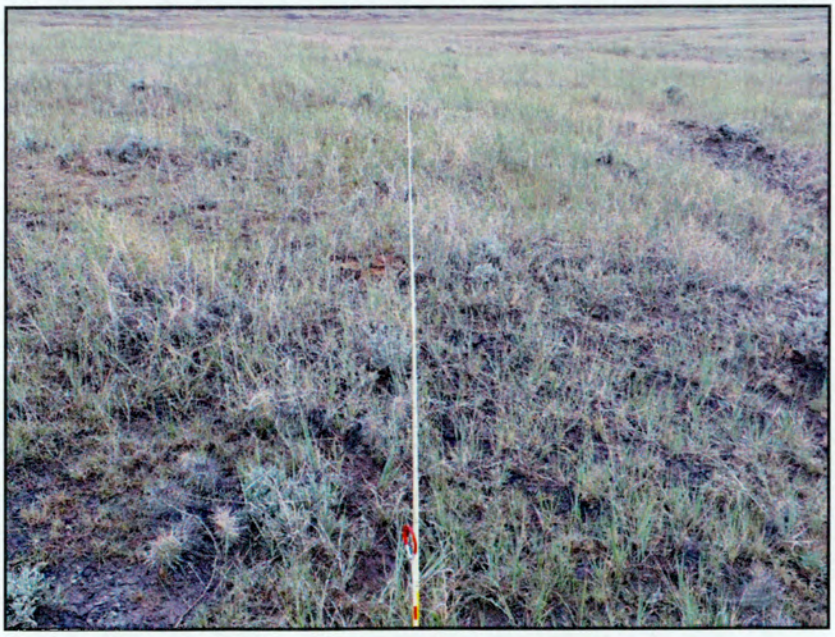


Figure 2. Representative photograph of perennial graminoid grassland.

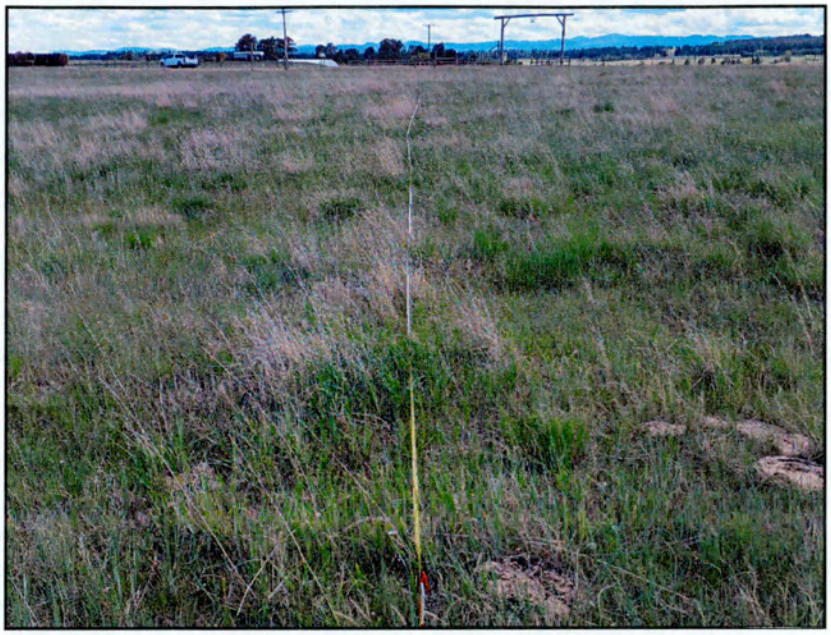


Figure 3. Representative photograph of perennial graminoid grassland.



Figure 4. Representative photograph of mixed shrubland.

4 WETLANDS

No wetlands were observed or recorded during baseline vegetation surveys. Although Nuttall's alkaligrass (*Puccinellia nuttalliana*), an obligate wetland plant, and curly dock (*Rumex crispus*), a facultative wetland plant, were observed on two separate transects, these species would have not passed

the dominance test for presence of hydrophytic vegetation for a wetland. National Wetland Inventory data in Figure A-1 of Appendix A shows no wetlands fall into the survey area.

5 STATE AND COUNTY NOXIOUS PLANT SPECIES

There are currently seven species designated as noxious by the state by South Dakota Department of Agriculture (South Dakota Department of Agriculture 2021). The species include:

- Absinth wormwood (*Artemisia absinthium*)
- Leafy spurge (*Euphorbia esula*)
- Canada thistle (*Cirsium arvense*)
- Perennial sow thistle (*Sonchus arvensis*)
- Hoary cress (*Cardaria draba*)
- Purple loosestrife (*Lythrum salicaria*)
- Salt cedar (*Tamarix aphylla*, *T. chinensis*, *T. gallica*, *T. parviflora*, and *T. ramosissima*)

In addition, four species have been approved by the State Weed and Pest Control Commission as locally noxious weeds in Butte County (Butte County, South Dakota 2019). The species include:

- Scotch thistle (*Onopordum acanthium*)
- Phragmites (*Phragmites australis*)
- Common mullein (*Verbascum thapsus*)
- Common burdock (*Arctium minus*)

SWCA did not record or observe any of the state- or county-listed noxious plant species during baseline vegetation surveys conducted May 25 to 27, 2021.

6 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

No federally listed plant species are listed by the U.S. Fish and Wildlife Service (USFWS) as occurring in Butte County, South Dakota (USFWS 2021).

7 SOUTH DAKOTA LISTED THREATENED AND ENDANGERED SPECIES

Two plant species are currently listed under South Dakota's Endangered and Threatened Species Law (South Dakota Codified Laws [SDCL] Chapter 34A-8). Table 4 identifies the state-listed species from the South Dakota Department of Game, Fish, and Parks (SDGFP 2021), their listing status, and the likelihood of their occurrence in the project area. SWCA reviewed the range and distribution of these species to identify the likelihood of their occurrence.

Table 4. State-Listed Threatened and Endangered Species in Butte County, South Dakota

Common Name	Scientific Name	Federal Listing Status	Habitat	Potential to Occur in the Project Area
Leedy's Roseroot	*Rhodiola integrifolia* ssp. *leedyi*	Threatened	Cool, wet groundwater-fed limestone cliffs. In South Dakota, the subspecies occurs on Black Hills National Forest on a cliff approximately 7,000 feet above sea level.	None. No suitable habitat in the project area. No known occurrences in the assessment area.
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Moist tallgrass prairies and sedge meadows. Commonly found with sedges, reedgrass, and rushes, or where those plants meet tallgrasses.	None. No suitable habitat in the project area. No known occurrences in the assessment area.

8 DISCUSSION

The proposed survey area was surveyed for baseline vegetation information in support of BPM's proposed Security Bentonite Mine Project for the South Dakota Department of Agriculture and Natural Resources permit application. Baseline vegetation survey results conclude the dominant plant community type was perennial graminoid grassland, with western wheatgrass being dominant species. No wetlands, state or county designated noxious weeds, or threatened or endangered species or habitat were observed within the surveyed area.

8.1 Cover

As discussed in section 3.1.4, the dominant plant community type observed in the project area was perennial graminoid grassland. Mean absolute total ground cover across 20 transects 50-m was 82%. Bare ground only comprised approximately 17.7% of the transects sampled.

8.2 Species Diversity and Composition

Species diversity and composition in the project area was dominated by native cool season perennial grasses with 95% of transects containing one or more species from this life from. Native warm season perennial grasses were present on 45% of transects. Introduced perennial grasses were present on 80% of transects. Perennial forbs were present on 55% of transects while annual/biennial forbs were present on 35% of transects. Shrubs and subshrubs were both present on transects 20% of the time. Introduced annual grasses were present on 25% of transects, while grass-like species were present on 15% of transects. Succulents and cryptograms were the least common species and only found on transects 5% of the time.

8.3 Critical Resources

Per South Dakota requirements, SWCA assessed the survey area for critical resources (SDCL 45-6B-92(3)). The critical resources for vegetation purposes include riparian zones, mountain meadows, wetlands, and threatened or endangered species. As discussed in above sections, no riparian zones, mountain meadows, wetlands, or threatened or endangered species were observed in the survey area.

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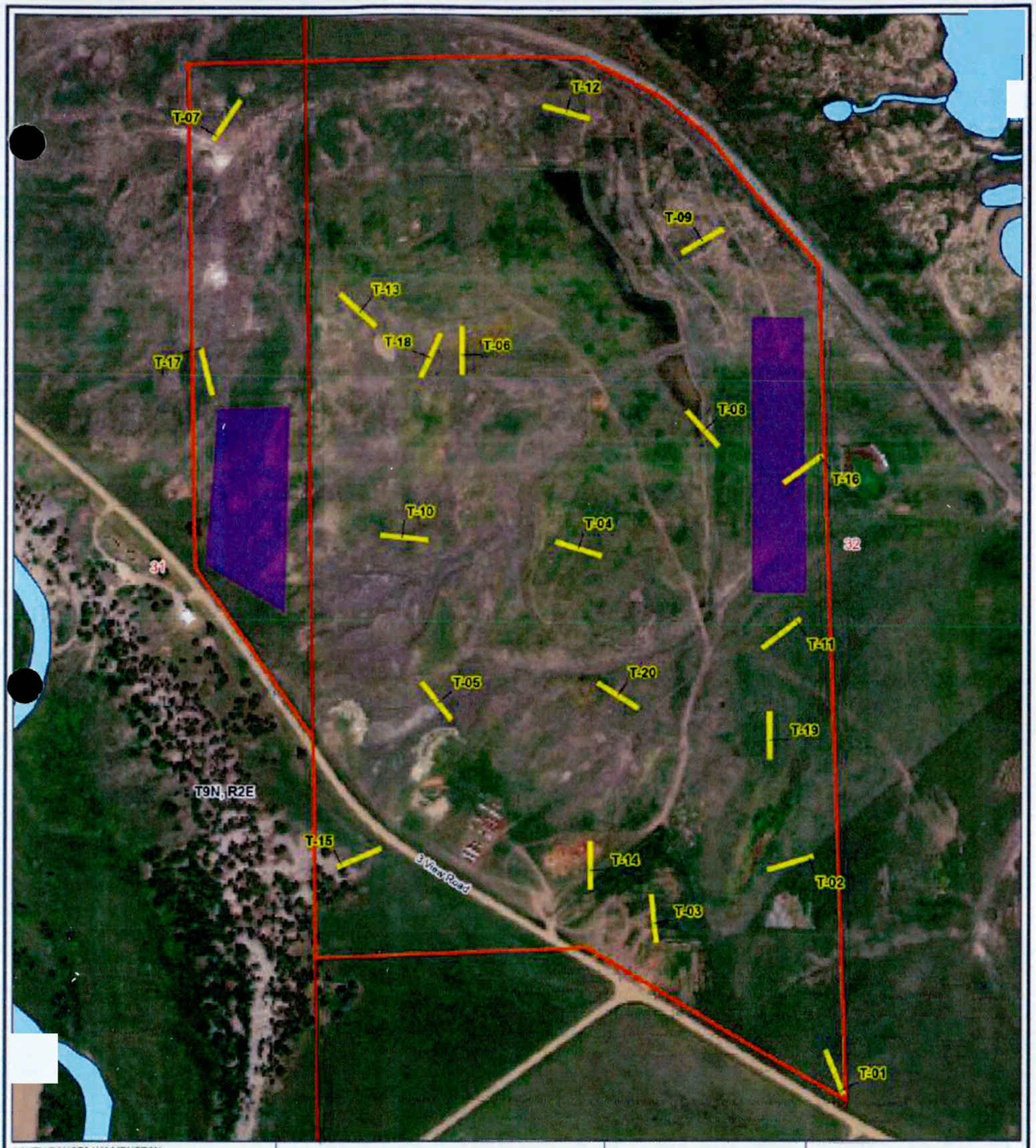
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APPENDIX A

Project Overview



SOUTH DAKOTA HALLIBURTON BASELINE

Project Overview, A-1

Project Boundary
Proposed Reference Areas
Vegetative Transects
National Wetlands Inventory
Township/ Range
Section

Butte County, South Dakota
USGS 7.5' Quadrangle: Sourdough Flats, SD, 44103-F8

NAD 1983 UTM Zone 13N
103.9104°W 44.6982°N

Base Map: ESRI ArcGIS Online, accessed July 2021

Updated: 7/19/2021
Project No. 61279
File: Fig6_1_VegetativeTransects

1:5,000

South Dakota

0 200 400 Feet
0 50 100 Meters

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APPENDIX B

Monitoring Data

Halliburton	Cover Data			Transect Number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Security Project, Butte County, SD				Transect ID:	T-01	T-02	T-03	T-04	T-05	T-06	T-07	T-08	T-09	T-10	T-11	T-12	T-13	T-14	T-15	T-16	T-17	T-18	T-19	T-20
Project Area Baseline Vegetation Transects				Orientation (deg):	158	253	354	107	321	179	14	318	240	96	52	286	312	179	247	54	346	25	179	122
Scientific Name	**Common Name**		**Mean Relative Total Vegetation Cover**	**Mean Absolute Cover %**	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %	Absolute Cover %
Introduced Annual Grass		**IAG**																						
Bromus tectorum	cheatgrass		1%	0.6		2	2							2					4		2			
Introduced Annual Grass subtotal:			**1%**	**0.6**		**2**	**2**							**2**					**4**		**2**			
Introduced Perennial Rhytomatous Grass		**IPG**																						
Poa pratensis	Kentucky bluegrass	**IPG**	17%	12.5	8	32	48	8	2	10	2		32			34		16	12	38			16	2
Bromus inermis	smooth brome	**IPG**	3%	2.4	2	2		18				4						8		12			2	
Introduced Perennial Bunch Grasses																								
Agropyron cristatum	crested wheatgrass	**IPG**	7%	5.1	46		20	8				10	2			2						6		8
Introduced Perennial Grass subtotal:			**27%**	**20.0**	**56**	**34**	**68**	**34**	**2**	**10**	**2**	**14**	**34**			**26**		**24**	**12**	**50**		**6**	**18**	**10**
Grass Like		**GL**																						
Carex filifolia	threadleaf sedge	**GL**	1%	0.9									6			2			10					
Grasslike subtotal:			**1%**	**0.9**									**6**			**2**			**10**					
Native Cool Season Perennial Grass		**NCSPG**																						
Pascopyrum smithii	western wheatgrass	**NCSPG**	51%	37.3	20	40	20	34	16	66	44	20	30	38	94	20	58		34	50	36	42	62	42
Elymus lanceolatus	thickspike wheatgrass	**NCSPG**	0%	0.3								6												
Native Cool Season Perennial Bunch Grasses		**NCSPG**																						
Poa secunda	Sandberg bluegrass	**NCSPG**	1%	0.8	4							10	2											
Elymus elymoides	squirreltail	**NCSPG**	2%	1.1								22												
Puccinellia nuttalliana	Nuttall's alkaligrass	**NCSPG**	1%	0.4							8													
Native Cool Season Perennial Grass subtotal:			**55%**	**39.9**	**24**	**40**	**20**	**34**	**16**	**66**	**52**	**58**	**32**	**38**	**94**	**20**	**58**		**34**	**50**	**36**	**42**	**62**	**42**
Native Warm Season Perennial Rhizomatous Grass		**NWSPG**																						
Bouteloua gracilis	blue grama	**NWSPG**	5%	3.6							2		6	14		10	14				22	4		
Native Warm Season Perennial Bunch Grasses		**NWSPG**																						
Schizachyrium scoparium	little bluestem	**NWSPG**	0%	0.2															4					
Schedonnardus paniculatus	tumblegrass	**NWSPG**	0%	0.1			2																	
Native Warm Season Perennial Grass subtotal:			**5%**	**3.9**			**2**				**2**		**6**	**14**		**10**	**14**		**4**		**22**	**4**		
Annual/Biennial Forb		**ABF**																						
Bassia scoparia	burningbush (Kochia)	**ABF**	1%	1.0							2	2						14						2
Thlaspi arvense	field pennycress	**ABF**	1%	0.4			4		2									2						
Tragopogon dubius	yellow salsify	**ABF**	0%	0.2					2					2										
Annual/Biennial Forb subtotal:			**2%**	**1.6**			**4**		**4**		**2**	**2**		**2**				**16**						**2**
Perennial Forb		**PF**																						
Achillea millefolium	common yarrow	**PF**	0%	0.1																		2		
Lomatium foeniculaceum	Desert Biscuitroot	**PF**	1%	0.4														8						
Vicia americana	American Vetch	**PF**	2%	1.1			2	6	2	2								10						
Sphaeralcea coccinea	scarlet globemallow	**PF**	0%	0.3				6																
Taraxacum officinale	common dandelion	**PF**	2%	1.5		2		6		2						6	2	8		2	2			
Rumex crispus	curlydock	**PF**	0%	0.2														4						
Perennial Forb subtotal:			**5%**	**3.6**		**2**	**2**	**18**	**2**	**4**						**6**	**2**	**30**		**2**	**2**	**2**		
Subshrub		**SS**																						
Atriplex gardneri	Gardner's saltbush	**SS**	1%	0.6														10					2	
Artemisia ludoviciana	white sagebrush	**SS**	0%	0.1															2					
Gutierrezia sarothrae	broom snakeweed	**SS**	0%	0.1							2													
Subshrub subtotal:			**1%**	**0.8**							**2**							**10**	**2**				**2**	
Shrub		**S**																						
Artemisia tridentata	Big sagebrush	**S**	2%	1.4					14								4				10			
Ericameria nauseosa	rubber rabbitbrush	**S**	0%	0.1							2													
Shrub subtotal:			**2%**	**1.5**					**14**		**2**						**4**				**10**			
Succulents		**SUCC**																						
Opuntia polyacantha	plains pricklypear	**SUCC**	**0%**	**0.1**															2					
Succulents subtotal:			**0%**	**0.1**															**2**					
Total Creditable Vegetation Cover:			**100%**	**72.9**	**80**	**78**	**98**	**86**	**38**	**80**	**62**	**74**	**78**	**56**	**94**	**64**	**78**	**80**	**68**	**82**	**72**	**54**	**82**	**54**
Total Vegetation Cover:			**100%**	**73.0**	**80**	**78**	**98**	**86**	**38**	**80**	**62**	**74**	**78**	**56**	**94**	**64**	**78**	**80**	**68**	**82**	**72**	**54**	**82**	**55**
Cryptogams		**CRYP**																						
Xanthoparmelia chlorochroa	tumbleweed shield lichen	**CRYP**		0.2																	4			
Cryptogams subtotal:				**0.2**																	**4**			
Litter				**9.0**	**18**	**6**	**2**	**6**	**2**	**12**	**10**	**4**	**2**	**16**	**2**	**20**	**8**	**6**	**10**	**8**	**8**	**20**	**12**	**8**
Rock				**0.2**																				**4**
Total Ground Cover:				**82**	**98**	**84**	**100**	**92**	**40**	**92**	**72**	**78**	**80**	**72**	**96**	**84**	**86**	**86**	**78**	**90**	**84**	**74**	**94**	**67**
Bare Ground				**17.7**	**2**	**16**		**8**	**60**	**8**	**28**	**22**	**20**	**28**	**4**	**16**	**14**	**14**	**22**	**10**	**16**	**26**	**6**	**33**

Halliburton	Species Diversity & Composition		Transect Number:		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Security Project, Butte County, SD			Transect ID:		T-01	T-02	T-03	T-04	T-05	T-06	T-07	T-08	T-09	T-10	T-11	T-12	T-13	T-14	T-15	T-16	T-17	T-18	T-19	T-20
Project Area Baseline Vegetation Transects			Orientation (deg):		158	253	354	107	321	179	34	318	240	96	52	286	312	179	247	54	346	25	179	122
Scientific Name	**Common Name**		**Frequency %**	**Mean Number Species per 50 m²**	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?	Present?
Introduced Annual Grass		**IAG**																						
Bromus tectorum	cheatgrass		25%	0.3			1	1						1					1		1			
Introduced Annual Grass # species:			**25%**	0.3			**1**	**1**						**1**					**1**		**1**			
Introduced Perennial Rhyzomatous Grass		**IPG**																						
Poa pratensis	Kentucky bluegrass	**IPG**	70%	0.7	1	1	1	1	1	1	1		1			1		1	1	1			1	1
Bromus inermis	smooth brome	**IPG**	35%	0.4	1	1		1				1								1			1	
Introduced Perennial Bunch Grasses																								
Agropyron cristatum	crested wheatgrass	**IPG**	40%	0.4	1		1	1				1	1			1						1		1
Introduced Perennial Grass # species:			**80%**	**1.5**	**3**	**2**	**2**	**3**	**1**	**1**	**1**	**2**	**2**			**2**		**2**	**1**	**2**		**1**	**2**	**2**
Grass Like		**GL**																						
Carex filifolia	threadleaf sedge	**GL**	15%	0.2									1			1			1					
Grasslike # species:			**15%**	**0.2**									**1**			**1**			**1**					
Native Cool Season Perennial Grass		**NCSPG**																						
Pascopyrum smithii	western wheatgrass	**NCSPG**	95%	1.0	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1
Elymus lanceolatus	thickspike wheatgrass	**NCSPG**	5%	0.1								1												
Native Cool Season Perennial Bunch Grasses		**NCSPG**																						
Poa secunda	Sandberg bluegrass	**NCSPG**	15%	0.2	1							1	1											
Elymus elymoides	squirreltail	**NCSPG**	5%	0.1								1												
Puccinellia nuttalliana	Nuttall's alkaligrass	**NCSPG**	5%	0.1							1													
Native Cool Season Perennial Grass # species:			**95%**	**1.3**	**2**	**1**	**1**	**1**	**1**	**1**	**2**	**4**	**2**	**1**	**1**	**1**	**1**		**1**	**1**	**1**	**1**	**1**	**1**
Native Warm Season Perennial Rhizomatous Grass		**NWSPG**																						
Bouteloua gracilis	blue grama	**NWSPG**	35%	0.4							1		1	1		1	1				1	1		
Native Warm Season Perennial Bunch Grasses		**NWSPG**																						
Schizachyrium scoparium	little bluestem	**NWSPG**	5%	0.1															1					
Schedonnardus paniculatus	tumblegrass	**NWSPG**	5%	0.1			1																	
Native Warm Season Perennial Grass # species:			**45%**	**0.5**			**1**				**1**		**1**	**1**		**1**	**1**		**1**		**1**	**1**		
Annual/Biennial Forb		**ABF**																						
Bassia scoparia	burningbush (Kochia)	**ABF**	20%	0.2							1	1					1							1
Thlaspi arvense	field pennycress	**ABF**	15%	0.2			1		1								1							
Tragopogon dubius	yellow salsify	**ABF**	10%	0.1					1					1										
Annual/Biennial Forb # species:			**35%**	**0.5**			**1**		**2**		**1**	**1**		**1**			**2**							**1**
Perennial Forb		**PF**																						
Achillea millefolium	common yarrow	**PF**	5%	0.1																		1		
Lomatium foeniculaceum	desert biscuitroot	**PF**	5%	0.1														1						
Taraxacum officinale	common dandelion	**PF**	25%	0.3		1		1								1	1	1						
Sphaeralcea coccinea	scarlet globemallow	**PF**	20%	0.2				1		1										1	1			
Rumex crispus	curly dock	**PF**	5%	0.1														1						
Vicia americana	American vetch	**PF**	25%	0.3			1	1	1	1								1						
Perennial Forb # species:			**55%**	**0.9**		**1**	**1**	**3**	**1**	**2**						**1**	**1**	**4**		**1**	**1**	**1**		
Subshrub		**SS**																						
Atriplex gardneri	Gardner's saltbush	**SS**	10%	0.1														1					1	
Artemisia ludoviciana	white sagebrush	**SS**	5%	0.1															1					
Gutierrezia sarothrae	broom snakeweed	**SS**	5%	0.1							1													
Subshrub # species:			**20%**	**0.2**							**1**							**1**	**1**				**1**	
Shrub		**S**																						
Artemisia tridentata	Big sagebrush	**S**	15%	0.2					1								1				1			
Ericameria nauseosa	rubber rabbitbrush	**S**	5%	0.1							1													
Shrub # species:			**20%**	**0.2**					**1**		**1**						**1**				**1**			
Succulents		**SUCC**																						
Opuntia polyacantha	plains pricklypear	**SUCC**	**5%**	**0.1**															1					
Succulents # species:			**5%**	**0.1**															**1**					
Total Creditable # species:			**100%**	**5.7**	5	4	7	8	6	4	7	7	6	4	1	6	6	7	7	4	5	4	4	4
Cryptograms		**SLCV**																						
Xanthoparmelia chlorochroa	flattened shield lichen	**CRYP**	5%	0.1																	1			
SLCV # species:			**5%**	**0.1**																	**1**			
Total # species:			**100%**	**5.8**	5	4	7	8	6	4	7	7	6	4	1	6	6	7	7	4	6	4	4	4

ATTACHMENT 5

Baseline Hydrology Survey Results for Proposed Security Project, Butte County, South Dakota

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MINERALS & MINING PROGRAM

Baseline Wildlife Report

BPM Security Bentonite Mine

Baseline Wildlife Survey Results for Proposed Security Project, Butte County, South Dakota

JULY 2021

PREPARED FOR

Bentonite Performance Minerals, LLC

SUBMITTED TO

South Dakota Department of Agriculture and Natural Resources

PREPARED BY

SWCA Environmental Consultants

BASELINE WILDLIFE SURVEY RESULTS FOR PROPOSED SECURITY PROJECT, BUTTE COUNTY, SOUTH DAKOTA

Prepared for

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Belle Fourche, South Dakota 57717

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SWCA Project No. 61279

July 2021

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1 INTRODUCTION

On behalf of Bentonite Performance Minerals (BPM), SWCA Environmental Consultants (SWCA) conducted baseline wildlife inventory field surveys for the proposed Security Project (project). The project is located in the southwest portion of Butte County, South Dakota, approximately 3 miles northwest of Belle Fourche in Sections 31 and 32, Township 9 North, Range 2 East. The total survey area encompasses 140.38 acres. Mine related disturbance will be limited to the area north of 3 View Road. There will be no mine related disturbance south of 3 View Road (Figure 1). The baseline wildlife inventory field surveys included passerine/breeding birds transect surveys, bald eagle (*Haliaeetus leucocephalus*) winter roost surveys, raptor nest surveys, and surveys for other species of concern. Incidental observations of all wildlife species were recorded during the previously noted surveys; however, targeted surveys for specific species were not conducted.

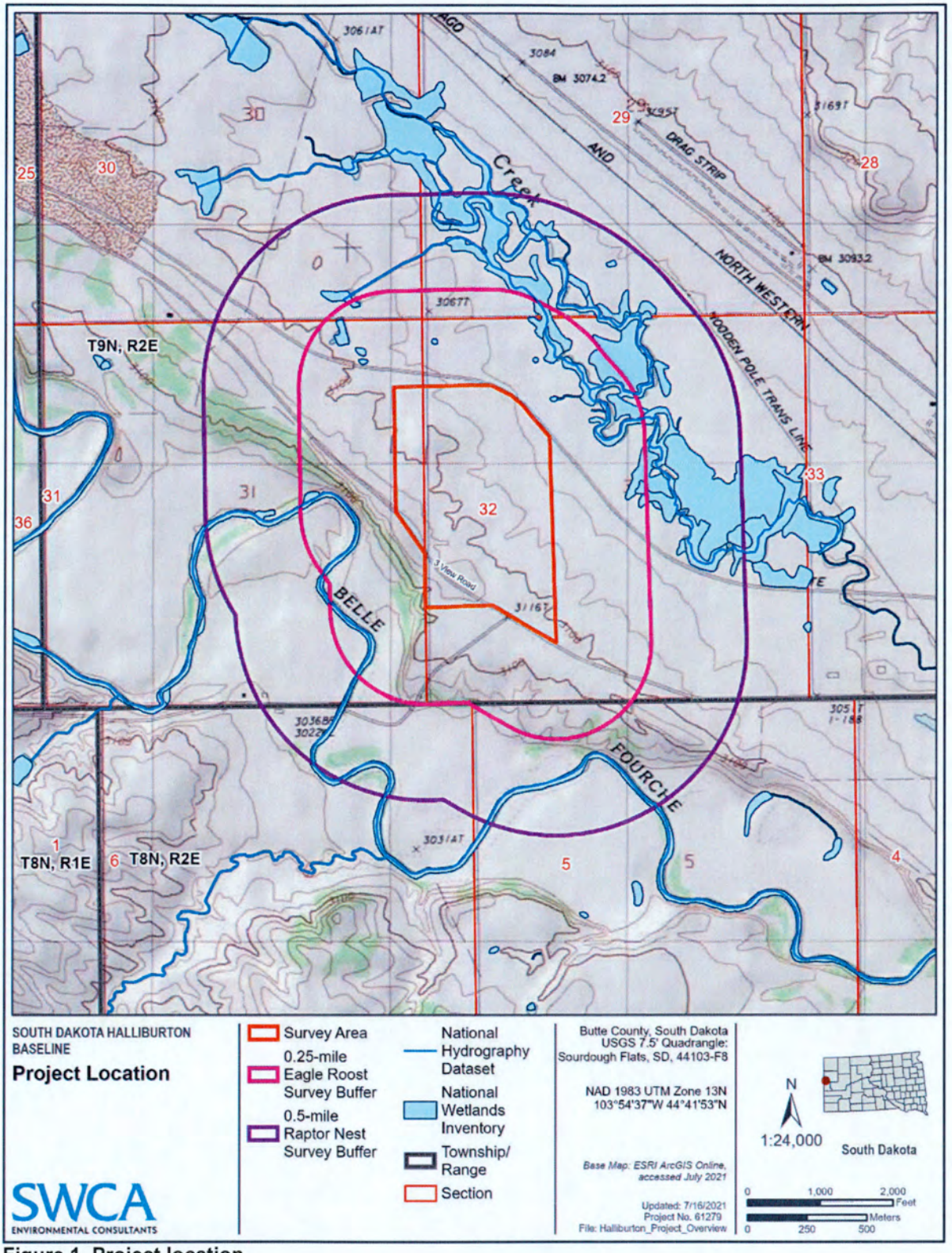


Figure 1. Project location.

2 METHODS

2.1 Desktop Analysis

The preliminary project site assessment was completed using a combination of existing information obtained from available public sources, including reports, published literature, online databases, and geographic information system (GIS) data. The following publicly available data sources, accessed in September 2020, were used to complete a desktop review of resources within the project and the specific resource buffers set forth below.

- Google Earth (2021)
- U.S. Geological Survey (USGS) LANDFIRE Database (USGS 2016)
- USGS National Topographic Map Database (USGS 2021a)
- USGS National Hydrography Dataset (NHD) (USGS 2021b)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS 2021a)
- USFWS Information for Planning and Consultation (IPaC) (USFWS 2021b)
- South Dakota State Wildlife Action Plan (South Dakota Department of Game, Fish and Parks [SDGFP] 2014)
- SDGFP Threatened and Endangered Species (SDGFP 2021a)
- SDGFP South Dakota Wildlife Action Plan Explorer (SDGFP 2019)
- eBird (2021)

2.2 Wildlife Inventory Field Surveys

SWCA conducted wildlife inventory field surveys in accordance with SDGFP's *Bentonite and Prairie Mining Project Wildlife and Vegetation Baseline Study Guidelines* (SDGFP 2016), which was provided by SDGFP (Stan Michals) on August 31, 2020. SWCA provided our proposed study protocol to SDGFP, which was approved (personal communication, Stan Michals, January 8, 2021). The purpose of the wildlife inventory field surveys is to provide BPM with the information necessary to determine the effects of the proposed mining and reclamation operations on wildlife species.

A general site visit to the study area occurred on September 9, 2020, to ground-truth land cover types and wildlife habitat; document where land cover types provide potential habitat for species of concern; inspect areas of potential habitat for species of concern noted during the desktop assessment; document readily observable features that may attract wildlife; and to record incidental wildlife observations. Qualified SWCA biologists conducted wildlife inventory field surveys on January 26 and 27, 2021, February 24 and 25, 2021, March 24 and 25, 2021, and May 25, 26, and 27, 2021. Based on the guidance set forth by the SDGFP and their approval of the survey methods prior to the wildlife inventory field surveys, SWCA conducted surveys using the specific methods discussed below; however, SWCA's biologists recorded incidental observations of all wildlife species observed while on-site.

2.2.1 *Breeding Bird Surveys*

An SWCA biologist conducted ground-based passerine and breeding bird belt transect surveys within the survey area on three consecutive mornings on May 25, 26, and 27, 2021. Surveys were conducted

between 0.5 hour before and 2 hours after local sunrise. Transect surveys consisted of three belt transects each measuring 100 by 1000 meters. Data recorded included species, number of individuals, age, sex, behavior, distance to bird, altitude, detection type, and Universal Transverse Mercator (UTM) coordinates.

2.2.2 *Bald Eagle Winter Roost Surveys*

Ground-based bald eagle winter roost surveys were conducted once per month from January through March 2021. Surveys occurred on January 26 and 27, 2021, February 24 and 25, 2021, and March 24 and 25, 2021, within a 0.25-mile buffer surrounding the survey area to confirm the presence or absence of roosting bald eagles. Surveys were conducted from publicly accessible county roads, which provided good views of the survey area and surrounding 0.25-mile buffer. Surveys were conducted in the morning from 0.5 hour before local sunrise to 0.5 hour after local sunrise, or in the evening from 0.5 hour before local sunset to 0.5 hour after local sunset. SWCA's biologist recorded all incidental bald eagle observations, including those made during other wildlife inventory field surveys.

2.2.3 *Raptor Surveys*

Ground-based raptor surveys and raptor nest surveys (including eagle nests) were conducted within a 0.5-mile buffer of the survey area once per month from January through March 2021. Surveys occurred on January 26 and 27, 2021, February 24 and 25, 2021, and March 24 and 25, 2021, and occurred concurrently with bald eagle roost surveys. Surveys were conducted from publicly accessible county roads, which provided good views of the survey area and surrounding 0.5-mile buffer. Active nest surveys were conducted from a distant vantage point to avoid flushing incubating raptors. Data recorded at raptor sighting locations and nest sites included species, number of individuals, substrate, nest condition, occupancy status, activity, and UTM coordinates. SWCA's biologist recorded all incidental raptor observations, including those made during other wildlife inventory field surveys.

2.2.4 *Other Species of Concern*

No systematic surveys were conducted for upland game bird species, small mammals, reptiles and amphibians, fish, waterfowl, shore birds, or big game. Incidental observations of all wildlife species, including species of concern, were recorded during a general site visit and during the previously discussed wildlife inventory field surveys. Additionally, SWCA used the results of the desktop analysis to identify habitats within the survey area that may harbor species of concern; those habitats were visited during the wildlife inventory field surveys to determine suitability and to increase the likelihood of species observations.

3 ENVIRONMENTAL SETTING

According to the Natural Resources Conservation Service, the survey area lies within the Pierre Shale Plains Major Land Resource Area (MLRA) 60A, which is in the Missouri Plateau, Unglaciated, Section of the Great Plains Province of the Interior Plains. It is an area of old plateaus and terraces that have been deeply eroded. Average annual precipitation in MLRA 60A is 13 to 22 inches. Most of the rainfall occurs as frontal storms early in the growing season and some high-intensity, convective thunderstorms later in the season. Precipitation in winter occurs mainly as snow. The average annual temperature is 43 to 49 degrees Fahrenheit with a freeze-free period averaging about 150 days. Native vegetation consists mostly of grasses and forbs with some trees and shrubs occurring along streams. Native vegetation includes western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula*), blue grama (*Bouteloua gracilis*), purple coneflower (*Echinacea* Moench), and prairie coneflower (*Ratibida* Raf.) (Natural

Resources Conservation Service 2006). The survey area's elevation is approximately 3,100 feet above mean sea level.

The 2016 USGS LANDFIRE Database (USGS 2016) indicates that most of the survey area features grassland (91.95 acres or 65.5%), mixed evergreen-deciduous shrubland (41.96 acres, or 29.9%), and annual grass/forb (5.31 acres or 3.8%). The remaining 0.80% consists of the following types of land cover: deciduous shrubland and evergreen open tree canopy. Baseline vegetation survey results (provided under separate cover) conclude the dominant plant community type within the survey area is perennial graminoid grassland, with western wheatgrass being the dominant species. No wetlands or waterbodies were identified within the survey area and the survey area is generally lacking trees and shrubs.

The survey area lies in a rural, undeveloped setting used primarily for grazing cattle. Aerial imagery review and field surveys indicate the presence of stockpiled materials such as hay bale rows, dirt and rock piles, and semi-trailer storage. Development consists of 3 VW Road, as well as two-track roads and fences.

4 RESULTS

4.1 U.S. Fish and Wildlife Service Threatened and Endangered Species

The IPaC provides information regarding federally threatened, endangered, proposed, and candidate species within a given area (USFWS 2021b). The IPaC indicates that the survey area and the area within a 15-mile radius of the project area are within the ranges of three species listed under the Endangered Species Act: rufa red knot (*Calidris canutus rufa*), whooping crane (*Grus americana*), and northern long-eared bat (*Myotis septentrionalis*). The USFWS *Threatened and Endangered Species Active Critical Habitat Report* (USFWS 2021c) indicates that critical habitat for threatened and endangered species has not been designated in Butte County, South Dakota. Table 1 lists the USFWS threatened and endangered species listed for the area, their listing status, and the likelihood of their occurrence in the survey area.

Table 1. U.S. Fish and Wildlife Service Threatened and Endangered Species

Common Name	Scientific Name	Endangered Species Act Status	Potential to Occur in Survey Area
Birds			
Rufa red knot	*Calidris canutus rufa*	Threatened	Low
Whooping crane	*Grus americana*	Endangered	Low
Mammals			
Northern long-eared bat	*Myotis septentrionalis*	Threatened	Low

Source: USFWS (2021b)

4.1.1 *Rufa Red Knot*

The rufa red knot was listed as federally threatened on January 12, 2015 (USFWS 2014a). The State of South Dakota has not assigned a state status to this species (SDGFP 2019). The rufa red knot is a medium-sized shorebird that breeds in the Canadian Arctic and migrates to wintering grounds on the United States Gulf Coast and in South America (USFWS 2014b). The species generally occurs along the

ocean coasts during migration, but recent studies employing geolocators have shown that some individuals use a central flyway across the midcontinental United States and can be found at stop over sites in the Northern Great Plains; however, sightings of this species in South Dakota are limited (USFWS 2014b). The survey area is lacking the preferred habitat for the rufa red knot; therefore, the rufa red knot is unlikely to occur within the survey area.

4.1.2 *Whooping Crane*

The whooping crane was listed as federally endangered in 1967 (USFWS 2018). The USFWS indicates that South Dakota is within the whooping crane migration corridor. Suitable stopover habitat in South Dakota includes cropland and pastures, wet meadows, shallow marshes, and waterbodies (USFWS 2010). Although the whooping crane is state-listed as endangered in South Dakota (SDGFP 2019), the state contains no designated critical habitat for the species.

Due to the lack of wetlands and cropland in the survey area, it is unlikely for this species to use the survey area for stopover habitat (USFWS 2018). The survey area is approximately 50 miles west of the core migration corridor (Pearse, Rabbe, Bidwell et al. 2018; Pearse, Rabbe, Juliusson et al. 2018); however, historic confirmed sightings have been documented in the area (USFWS 2021d), so it is possible that whooping crane could migrate though the survey area. Review of the USFWS Whooping Crane Tracking Project Database indicates there is one whooping crane observation record within 10 miles of the survey area: one confirmed sighting of an adult whooping crane was reported in the fall of 2004 approximately 3.4 miles southwest of the survey area (USFWS 2021e).

4.1.3 *Northern Long-eared Bat*

The northern long-eared bat was listed as federally threatened by the USFWS on May 4, 2015 (USFWS 2016). The State of South Dakota has not assigned a state status to this species (SDGFP 2019). The northern long-eared bat occupies a wide range of rocky and forested habitats. Suitable winter habitat includes large caves and mines (USFWS 2016). Summer day roosts include abandoned buildings, bridges, hollow trees, stumps, areas under loose bark, and spaces within rock fissures (Jones and Choate 1978). The USFWS (2016) shows the entirety of South Dakota as lying within the range for this species, and there are 7 known hibernacula in the Black Hills where hibernating northern long-eared bats have been documented (South Dakota Bat Working Group 2004). No caves or mines that would provide suitable winter habitat are within the survey area. Additionally, no large tracts of contiguous forested habitat occur within the survey area. Therefore, the northern-long eared bat is unlikely to occur within the survey area.

4.2 South Dakota Endangered and Threatened Species

Twenty-one (21) species are listed under South Dakota's Endangered and Threatened Species Law (South Dakota Codified Laws Chapter 34A-8). Table 2 identifies the state-listed species (SDGFP 2021a), their listing status, and the likelihood of their occurrence in the survey area. SWCA reviewed the range and distribution of these species to identify the likelihood of their occurrence. Species that have potential to occur in the survey area based on range and habitat associations are further discussed in this section. The survey area lacks suitable aquatic habitat for fish and amphibian species. Bird species with low potential to occur in the survey area could pass through the area but would be unlikely to feed, nest, or rest there.

Table 2. State of South Dakota Endangered and Threatened Species

Common Name	Scientific Name	State of South Dakota Status	Potential to Occur in Survey Area
Fish			
Banded killifish	*Fundulus diaphanus*	Endangered	None. No suitable habitat is in the survey area.
Blacknose shiner	*Notropis heterolepis*	Endangered	None. No suitable habitat is in the survey area.
Finescale dace	*Chrosomus neogaeus*	Endangered	None. Documented in Butte County; however, no suitable habitat is in the survey area.
Longnose sucker	*Catostomus catostomus*	Threatened	None. Documented in Butte County; however, no suitable habitat is in the survey area.
Northern pearl dace	*Margariscus nachtriebi*	Threatened	None. No suitable habitat is in the survey area.
Northern redbelly dace	*Chrosomus eos*	Threatened	None. No suitable habitat is in the survey area.
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	None. No suitable habitat is in the survey area.
Sicklefin chub	*Macrhybopsis meeki*	Endangered	None. No suitable habitat is in the survey area.
Sturgeon chub	*Macrhybopsis gelida*	Threatened	None. No suitable habitat is in the survey area.
Reptiles and Amphibians			
Eastern hognose snake	*Heterodon platirhinos*	Threatened	None. Only known from southeastern South Dakota and south-central South Dakota.
False map turtle	*Graptemys pseudogeographica*	Threatened	None. No suitable habitat is in the survey area.
Lined snake	*Tropidoclonion lineatum*	Endangered	None. Only known from southeastern South Dakota
Birds			
American dipper	*Cinclus mexicanus*	Threatened	None. No suitable habitat is in the survey area.
Eskimo curlew	*Numenius borealis*	Endangered	None. No records of this species in South Dakota. Species is possibly extinct.
Least tern	*Sterna antillarum*	Endangered	None. No suitable habitat is in the survey area.
Osprey	*Pandion haliaetus*	Threatened	**Low.** No suitable habitat is in the survey area; however, potential suitable hunting or nesting habitat is within the 0.5-mile raptor nest survey buffer. Species may occur as a rare migrant.
Peregrine falcon	*Falco peregrinus*	Endangered	**Low.** No suitable habitat is in the survey area; however, potential suitable habitat is within the 0.5-mile raptor nest survey buffer. Species may occur as a rare migrant.
Piping plover	*Charadrius melodus*	Threatened	None. No suitable habitat is in the survey area. Species may occur as a rare migrant.
Whooping crane	*Grus americana*	Endangered	**Low.** Documented in Butte County; however, outside of the core migration corridor.
Mammals			
Black-footed ferret	*Mustela nigripes*	Endangered	**None.** No prairie dog colonies large enough to support this species exist near the survey area. No species occurrences in the area have been documented.
Swift fox	*Vulpes velox*	Threatened	**Low.** Documented in Butte County. Survey area contains suitable mixed-grass prairie habitat.

SDGFP (2018, 2019)

4.2.1 *Whooping Crane*

See Section 4.1.2.

4.2.2 *Osprey*

Within South Dakota, osprey (*Pandion haliaetus*) nest in the Black Hills and have been reintroduced along the Missouri River in Clay and Yankton Counties. Osprey also nest on Big Stone Power Plant property in northeastern South Dakota. The species migrates along rivers and large wetlands and primarily inhabits lakes, rivers, and coastal bays (SDGFP 2019).

Since no large rivers, lakes, or wetlands are in the survey area, the potential for osprey to occur there is low. The survey area lies within the migratory range of osprey, where the species rarely occurs during migration. The only identified osprey summer range in South Dakota is in the Black Hills and extreme northeastern corner of the state (SDGFP 2019). It is unlikely this species would occur in the survey area; any occurrences would likely consist of individuals passing through the area. Trees suitable for nesting is present within the 0.5-mile raptor nest survey buffer along the Belle Fourche River; however, since there is no water within the survey area, the project is unlikely to negatively impact this species.

4.2.3 *Peregrine falcon*

Peregrine falcons (*Falco peregrinus*) are statewide migrants and are uncommon during the winter months. Historically, this species had a very limited nesting distribution in western South Dakota. Three reintroduction projects have taken place in South Dakota, with the most extensive project occurring in downtown Rapid City from 2011 to 2013 (SDGFP 2019).

The survey area lies within the migratory range of the peregrine falcon, where the species rarely occurs during migration. The only identified peregrine falcon summer range in South Dakota is in the Black Hills (SDGFP 2019). It is unlikely that this species would occur in the survey area; any occurrences would likely consist of individuals passing through the area.

4.2.4 *Swift Fox*

The swift fox (*Vulpes velox*) is found mainly in southwestern South Dakota, including Butte County (SDGFP 2018). This species has been reintroduced on the Bad River Ranch in central South Dakota approximately 90 miles southeast of the survey area, but no viable populations exist there. A native remnant population in Fall River County has mixed with reintroduced animals from Badlands National Park and Pine Ridge Reservation (SDGFP 2018). Fall River County is approximately 85 miles south of the survey area and Badlands National Park and Pine Ridge Reservation is approximately 85 miles southeast of the survey area. The swift fox inhabits open shortgrass or mixed-grass prairies. The survey area contains open grasslands; therefore, the swift fox has low potential to occur there.

4.3 Other Species of Concern

4.3.1 *Breeding Bird Surveys*

Seventeen (17) bird species were observed during breeding bird surveys and are listed in Table 3. One additional species, the European starling (*Sturnus vulgaris*), was observed during a general site visit to the survey area on September 9, 2020.

Table 3. Breeding Bird Survey Results.

Common Name	Scientific Name	Number Observed or Heard
Barn swallow	*Hirundo rustica*	52
Red-winged blackbird	*Agelaius phoeniceus*	26
Western meadowlark	*Sturnella neglecta*	26
Rock pigeon	*Columba livia*	20
Mourning dove	*Zenaida macroura*	12
Tree swallow	*Tachycineta bicolor*	11
Vesper sparrow	*Pooecetes gramineus*	9
Brewer's blackbird	*Euphagus cyanocephalus*	7
Lark bunting	*Calamospiza melanocorys*	7
American robin	*Turdus migratorius*	5
Black-capped chickadee	*Poecile atricapillus*	4
Eastern kingbird	*Tyrannus tyrannus*	3
White-breasted nuthatch	*Sitta carolinensis*	3
Chipping sparrow	*Spizella passerina*	1
Common grackle	*Quiscalus quiscula*	1
Eastern meadowlark	*Sturnella magna*	1
Small unknown species	N/A	1

4.3.2 *Bald Eagle Winter Roost Surveys*

No bald eagle roosts were observed within the 0.25-mile eagle roost survey buffer during eagle winter roost surveys. However, potential habitat that could be used by roosting eagles was observed within the 0.25-mile eagle roost survey buffer, primarily to the west and southwest of the survey area associated with the Belle Fourche River.

4.3.3 *Raptor Surveys*

No active or inactive raptor nests were observed within the 0.5-mile raptor nest survey buffer during the ground-based raptor and raptor nest surveys.

Raptor species that were observed in the survey area over the course of all wildlife inventory field studies include turkey vulture (*Cathartes aura*), bald eagle, American kestrel (*Falco sparverius*), and sharp-shinned hawk (*Accipiter striatus*).

While no raptor nests were located within the 0.5- mile raptor nest survey buffer, suitable nesting habitat was observed within the 0.5-mile raptor nest survey buffer, primarily to the west and southwest of the survey area associated with the Belle Fourche River. Additionally, the entirety of the survey area could be used by foraging raptors including but not limited to the raptor species listed in Table 4.

Table 4. Regular Status Raptor Species in South Dakota.

Common Name	Scientific Name
Osprey	*Pandion haliaetus*
Bald eagle	*Haliaeetus leucocephalus*
Northern harrier	*Circus cyaneus*
Sharp-shinned hawk	*Accipiter striatus*
Cooper's hawk	*Accipiter cooperii*
Northern goshawk	*Accipiter gentilis*
Broad-winged hawk	*Buteo platypterus*
Swainson's hawk	*Buteo swainsoni*
Red-tailed hawk	*Buteo jamaicensis*
Ferruginous hawk	*Buteo regalis*
Rough-legged hawk	*Buteo lagopus*
Golden eagle	*Aquila chrysaetos*
Turkey vulture	*Cathartes aura*
American kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Gyrfalcon	*Falco rusticolus*
Peregrine falcon	*Falco peregrinus*
Prairie falcon	*Falco mexicanus*
Barn owl	*Tyto alba*
Eastern screech-owl	*Megascops asio*
Great horned owl	*Bubo virginianus*
Snowy owl	*Bubo scandiacus*
Burrowing owl	*Athene cunicularia*
Barred owl	*Strix varia*
Long-eared owl	*Asio otus*
Short-eared owl	*Asio flammeus*
Northern saw-whet owl	*Aegolius acadicus*

Source: SDGFP (2019)

4.3.4 *Upland Game Birds*

Nine upland game birds are known to occur in South Dakota (Table 5). One American crow (*Corvus brachyrhynchos*) was observed during the wildlife inventory field surveys; however, no systematic surveys were conducted. It is unlikely that the mine would have any population level impacts on this species due to other suitable habitat in adjacent areas.

Table 5. Upland Game Birds in South Dakota.

Common Name	Scientific Name	Habitat Potential
Chukar partridge	*Alectoris chukar*	No wild populations of this species are found in South Dakota. Suitable habitat may be present within the survey area.
Ruffed grouse	*Bonasa umbellus*	Species occurs in the northern Black Hills where aspen is present. No suitable habitat is present within the survey area.
Greater sage-grouse	*Centrocercus urophasianus*	Survey area is within species core range. No suitable habitat is present within the survey area.
Northern bobwhite	*Colinus virginianus*	Species range occurs outside of the survey area.
American crow	*Corvus brachyrhynchos*	Suitable habitat is present within the survey area.
Hungarian partridge	*Perdix perdix*	Suitable habitat is present within the survey area.
Ring-neck pheasant	*Phasianus colchicus*	Occurrence is few to locally common in Butte County. Suitable habitat may be present within the survey area.
Greater prairie chicken	*Tympanuchus cupido*	Occurrence is rare in Butte County. Suitable habitat is present within the survey area.
Sharp-tailed grouse	*Tympanuchus phasianellus*	Survey area is within species range. Suitable habitat is present within the survey area.

Source: SDGFP (2019), ebird (2021)

4.3.5 *Small Mammals*

No small mammals were incidentally observed in the survey area during the wildlife inventory field surveys; however, no systematic surveys were conducted. While it is likely that individual small mammals could be displaced from the proposed project, it is not likely that this project would have significant impacts on small mammal population due to similar suitable habitat nearby.

4.3.6 *Reptiles and Amphibians*

Ten (10) reptile and amphibian species are known to occur in Butte County (Table 6). No reptiles or amphibians were observed in the survey area during the wildlife inventory field studies; however, no systematic surveys were conducted. Since there are no wetlands or waterbodies within the survey area, it is unlikely that any amphibians would be impacted by the project. It is unlikely that the proposed project would have any long-term effects on reptiles since displaced individuals could use similar habitat adjacent to the proposed project.

Table 6. Amphibians and Reptile Species that May Occur in Butte County.

Common Name	Scientific Name
Western tiger salamander	*Ambystoma mavortium*

Common Name	Scientific Name
Woodhouse's toad	*Anaxyrus woodhousii*
Boreal chorus frog	*Pseudacris maculata*
Northern leopard frog	*Rana pipiens*
Snapping turtle	*Chelydra serpentina*
Painted turtle	*Chrysemys picta*
North American racer	*Coluber constrictor*
Gophersnake	*Pituophis catenifer*
Plains gartersnake	*Thamnophis radix*
Prairie rattlesnake	*Crotalus viridis*

Source: Amphibians and Reptiles of South Dakota 2021

4.3.7 *Fish*

No wetlands or waterbodies were identified in the survey area. Therefore, no impacts to fish species would occur.

4.3.8 *Waterfowl and Shorebird*

Waterfowl and shore bird species observed in the survey area during the wildlife inventory field surveys included mallards (*Anas platyrhynchos*), Canada geese (*Branta canadensis*), a ring-billed gull (*Larus delawarenis*), and long-billed curlew (*Numenius americanus*); however, no systematic surveys were conducted. Waterfowl and shorebirds may pass through the survey area during spring and fall migration; however, no wetlands or waterbodies are present within the survey area that would make it overly attractive to these species. Therefore, the proposed project is unlikely to displace or negatively impact waterfowl or shorebirds.

4.3.9 *Big Game*

Four big game species are known to occur in and around the survey area. These species include pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), and elk (*Cervus canadensis*) (SDGFP 2019). Elk core population occurs in higher elevations in the black hills; however, Butte County prairie landscapes hold limited herds of elk (SDGFP 2021b).

White-tailed deer, pronghorn, and mule deer were observed in the survey area during wildlife inventory field surveys; however, no systematic surveys were conducted. It is unlikely that the proposed project would have any long-term effects on these species since displaced individuals could use similar habitat adjacent to the proposed project.

5 DISCUSSION

Wildlife inventory field surveys were conducted to provide BPM with the information necessary to determine the effects of the proposed mining and reclamation operations on wildlife species. Desktop analysis was performed and field verified for potential habitat or presence of federally or state-listed species or other species of concern. During wildlife inventory field surveys, no federally threatened or endangered species were observed in the survey area. Additionally, no South Dakota State–listed

endangered or threatened species were observed in the survey area. Seventeen (17) bird species were observed in the survey area during breeding bird surveys, none of which were federally or state-listed. Additionally, the project is unlikely to have population-level impacts on the observed species as any displaced individuals could use similar habitat adjacent to the proposed project. No bald eagle roosts or active raptor nests were observed within the survey area; however, potential habitat that could be used by eagles is located within 0.5 mile from the survey area. Four raptor species were observed in the survey area either during wildlife inventory field surveys or a general site visit. The proposed project is not anticipated to negatively impact populations of upland game birds, small mammals, reptiles, or big game species as any displaced individuals could use similar habitat adjacent to the proposed project. The proposed project is not anticipated to negatively impact populations of amphibians, waterfowl and shorebirds, or fish species as no aquatic habitats are present in the proposed project area.

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DEPARTMENT OF GAME, FISH AND PARKS
Division of Wildlife – Regional Office
4130 Adventure Trail
Rapid City, South Dakota 57702-0303

February 14, 2024

Attn. Michael Barr
Bentonite Performance Minerals
554 US Hwy 212
Belle Fourche, SD

Subject: Wildlife Contractor Approval of SWCA Environmental Consultants

Dear Michael,

As requested, this letter represents South Dakota Game, Fish & Parks approval of SWCA Environmental Consultants as a wildlife contractor for wildlife evaluations at the Security and Larson Mining Projects.

Please contact me by any of the numbers listed below with any questions regarding this letter.

Sincerely,

Stan Michals -Energy and Minerals Coordinator
SD/Game, Fish and Parks
4130 Adventure Trail
Rapid City, SD 57702
Cell (605)645-8881
Stan.Michals@state.sd.us

"Serving People, Managing Wildlife"

The Division of Wildlife will manage South Dakota's wildlife and fisheries resources and their associated habitats for their sustained and equitable use, and for the benefit, welfare, and enjoyment of the citizens of this state and its visitors.

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Archeological Context

BPM Security Bentonite Mine

Archeological Context Summary

The Bentonite Deposit project area is located in the Belle Fourche archeological region. This region consists of the Belle Fourche drainage basin, north of the hogback of the Black Hills. Portions of Butte and Meade counties are within this region. The Belle Fourche region has a rich archeological record dating from the Paleo-Indian period (12,500-8,000 B.P.) to the historic period (post A.D. 1861).

The First Americans Period (c. 15,000 BP) is represented by the first known inhabitants of the North American continent. Archeological sites from this time are extremely rare, and only a handful of these sites exist in the Americas. Dating of these sites is not definitive and many important questions remain unanswered. However, the current archaeological evidence supports that regional adaptation was already underway 12,000 years ago. Genetic and linguistic studies also provide mounting evidence that there were multiple migrations of people, and they were not of a shared, single biological or cultural stock.

The Clovis group of the Clovis, Folsom & Paleo-Indian Period (c.13,400[cal] - 7600 B.P.) are thought to be the first North American Culture which was followed by the Folsom after the Younger Dryas cold snap. No Clovis or Folsom sites have been found within the Belle Fourche archaeological region to date. The Late Paleo-Indian period followed Folsom as indicated by another climate change and lanceolate style parallel-oblique flaking. Two sites have been recorded within the Belle Fourche Archaeological region that represent the Late Paleo-Indian period.

The Plains Archaic is divided into Early, Middle and Late and distinguished by projectile point styles. However, recent evidence suggests that the varying projectile point styles may reflect differences in bison hunting strategies or in the environmental conditions, rather than time period. Early Plains Archaic (c. 7600 to 5000 B.P.) sites are quite rare and are characterized by projectile points that are distinctly side -notched. There are many regional variations of this Early Archaic Projectile point style. There have only been two recorded Early Archaic sites in the Belle Fourche region. Middle Plains Archaic (c. 4900 to 3000 B.P.) is represented by sandstone plant grinders, roasting pits, bison corrals, buffalo jumps and stone circles. The McKean Complex is a notable Middle Plains Archaic archaeological manifestation with sites found across the Plains, sites include projectile points with indented bases and convex blade edges. There are numerous Middle Archaic sites within the Belle Fourche study area, many of which are attributed to the McKean Complex. Late Plains Archaic (3000 to 1500 B.P.) is defined by the appearance of corner-notched points in the archaeological record across the Plains. The Pelican Lake, Yonkee and Besant phases are associated with this time period. There are numerous Late Archaic sites located within the Belle Fourche Study area, many of which are attributed to the Pelican Lake phase.

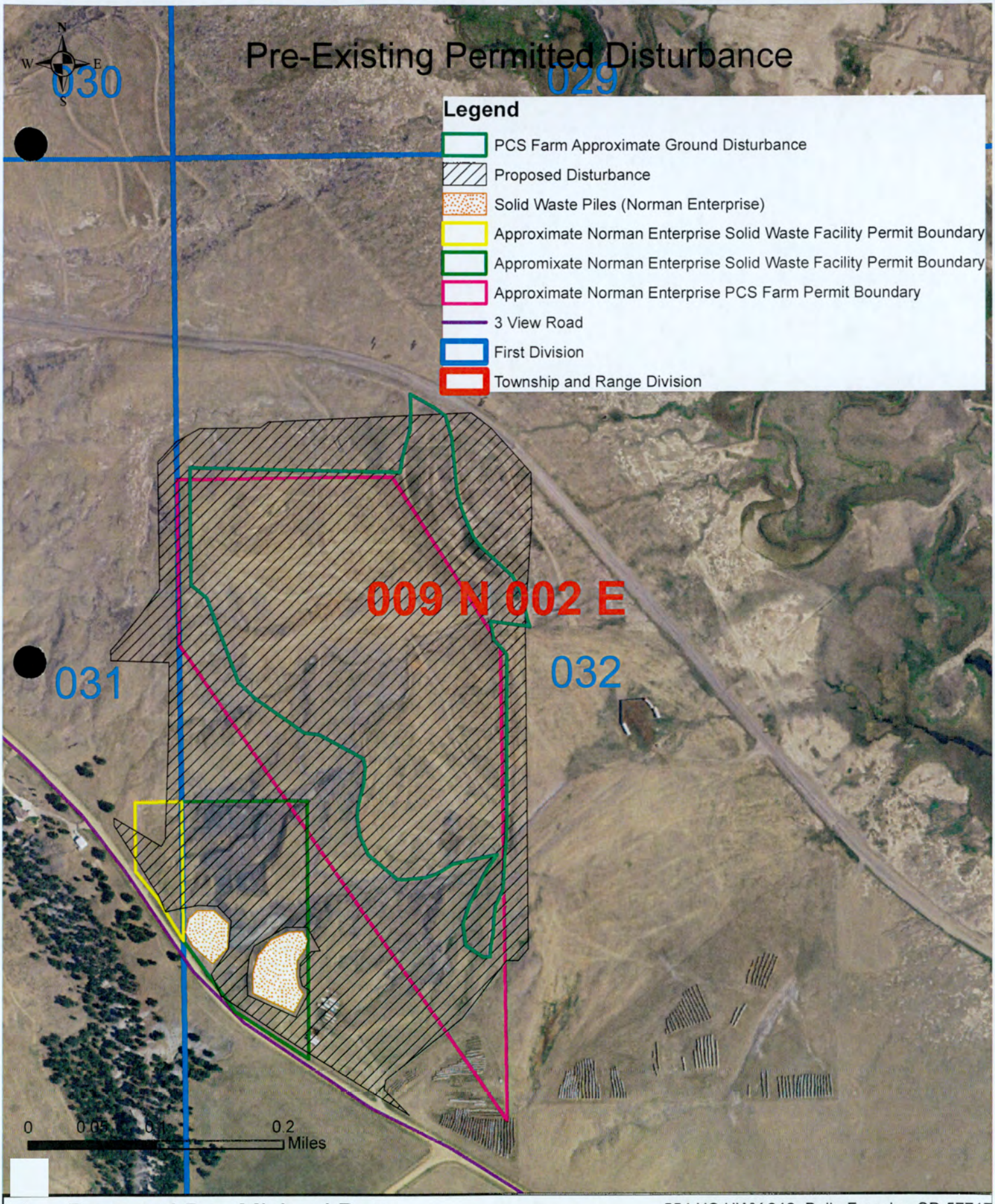
The Late Prehistoric period (1500 B.P. to 16th Century A.D.) is defined by a shift from atlatl technology of the Archaic period to the use of the bow and arrow in conjunction with true teepees and the introduction of ceramics on the Plains. The Woodland period began around 2000 years ago along the Middle Missouri in the Dakotas and is characterized by fixed settlements, increasingly complex societies, seed horticulture, potter/ceramic production and the construction of burial mounds. The Plains Village period began around 900 A.D. in the Middle Missouri and is characterized by larger villages, fortifications and horticulture produce. There are over 50 sites from this period on record within the Belle Fourche Study area.

The Protohistoric Period (c. 1600-1804) marks the beginning of great change on the Plains and is associated with the Euro-American presence. The introduction of horses and firearms influenced tribes to rely more on bison hunting and less on horticulture. Protohistoric sites are identified by the combination of native artifacts and European trade goods such as gun parts, trade beads, metal projectile points, and other metal items. There are 16 Protohistoric sites on record for the Belle Fourche study area.

The beginning of the Historic Period (1804 – 1950 A.D.) is signaled by the Louisiana Purchase in 1803 and the expeditions of Lewis and Clark in 1804. Most sites within the Belle Fourche region that are assigned to the Historic Period are associated with ranching, farming, railroad and/or industrial activities. There are several hundred historic period sites within this region. These site types include dumps, depressions, foundations, well/cisterns, farmsteads, non-farm ruins, artifact scatters, cairns, schools, railroads, cabins monuments, industrial sites, burials, earthworks, dams and roads.

Pre-existing Permitted and Closed Solid Waste and Petroleum Contaminated Soil Facility Map

BPM Security Bentonite Mine



Map Prepared By: Michael Barr
Date/Signature: 2/14/24
Map Criteria: DANR Requested

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Appendix D

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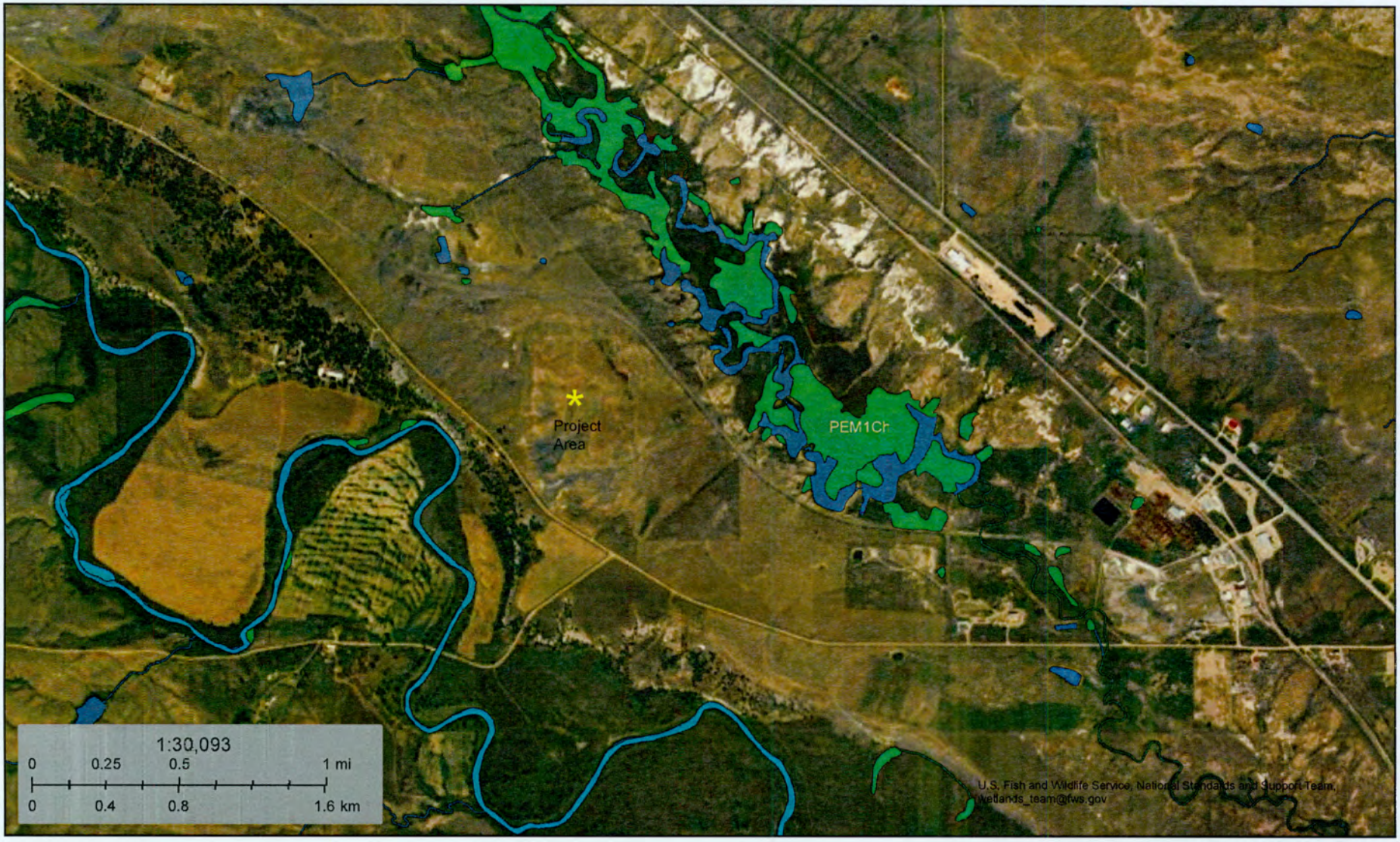
Appendix D

BPM Security Bentonite Mine

U.S. Fish and Wildlife Service

National Wetlands Inventory

Security



February 9, 2024

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

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

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National Wetlands Inventory (NWI)
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Archeological Baseline

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