



PU-21-048
Bridger Pipeline, LLC.
South Bend 16-inch Crude Oil
Pipeline
Topsoil Inspection Report

File No. 227705201

July 2022

Prepared for:

North Dakota Public Service Commission
600 E. Boulevard Avenue
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1.0 EXECUTIVE SUMMARY

The North Dakota Public Service Commission (PSC) retained Stantec Consulting Services Inc (Stantec) to complete topsoil inspection(s) during construction of the Bridger Pipeline, LLC. South Bend 16-inch Crude Oil Pipeline, PU-21-048 (i.e., the Project) in Golden Valley and McKenzie County, North Dakota. The purpose of the inspections is to ensure the Project is constructed in compliance with the siting laws and rules and the applicable PSC Orders for the Project, which includes a requirement that topsoil must be segregated from subsoil during the installation of the pipeline.

Construction involving soil disturbance for the Project began June 22, 2022. Stantec was present to observe the topsoil salvage and segregation by Loenbro Construction Company, Inc. (i.e., Loenbro) at the start of the Project near the Montana border. Loenbro Pipeline Construction is currently conducting all topsoil stripping on the Project. Bridger has also employed a third-party inspection company, Avery, to provide Environmental Inspection services on the Project.

Stantec has observed topsoil and subsoil removal and segregation done by the Loenbro contractor crews on the Project. Bridger has not identified any other contractors for soil stripping, though discussions did indicate the potential for another contractor to be involved with right-of-way (ROW) construction on the Project in the future.

This Topsoil Inspection Report includes documentation of topsoil stripping and segregation during the June 22-23, 2022 on-site inspections of the Project. By and large, soil removal and storage processes are satisfactory. Isolated minor issues of improper topsoil stripping depths and soil mixing were observed sporadically during the inspection. Contractors were made aware of these minor issues and plans for resolving these situations can be implemented in the future.

Stantec recommends that the PSC respond to Bridger's inquiry concerning topsoil stockpiling outside of the ROW and request to be informed of any new construction spreads involved with topsoil stripping not present during Stantec's June 23, 2022 compliance check.



2.0 BACKGROUND INFORMATION

2.1 INTRODUCTION

Bridger Pipeline LLC has begun construction on the South Bend Crude Oil Pipeline in Golden Valley County North Dakota. It is understood that portions of the Project in the state of Montana were commenced early this year. The transmission pipeline route within North Dakota stretches between Eighty Eight Oil Company's (EEOC) existing Johnson's Corner Terminal to the Montana border, and is approximately 81 miles long. Much of this route is through the US Forest Service-Little Missouri National Grasslands, and the corridor includes a mix of public and private parcels.

2.2 PURPOSE & SCOPE

The North Dakota Energy Conversion and Transmission Facility Act (North Dakota Century Code Chapter 49-22) authorizes the Public Service Commission to determine that the location, construction, and operation of jurisdictional energy conversion and transmission facilities will produce minimal adverse effects on the environment and the welfare of citizens of North Dakota. Construction inspections aim to ensure that such projects are constructed in compliance with the siting laws (North Dakota Century Code Chapter 49-22) and rules (North Dakota Administrative Code Article 69-06) and the applicable PSC Findings of Fact, Conclusions of Law, and Order (Order). The PSC issued its Findings of Fact, Conclusions of Law, and Order in Case No. PU-21-048 on June 8, 2022, granting Certificate of Corridor Compatibility No. 227 and Route Permit No. 237 for the Project.

The PSC retained Stantec to complete construction inspections, and specifically a topsoil inspection, of the Project. The inspection process included a review of the Application for Corridor Compatibility and Route Permit, the Project's Order, and other applicable documents. The primary intent of the initial topsoil inspection is to document compliance with PSC's Certificate Relating to Project Order Provision #12, which states: *"Company understands and agrees that topsoil, up to 12 inches, or topsoil to the depth of cultivation, whichever is greater, over and along trench areas where cuts will be made, must be carefully stripped and segregated from the subsoil. Any area on which excavated subsoil will be placed must first be stripped of topsoil. The stripped topsoil must not be stockpiled in natural drainages, and must be protected from water erosion. Care must be taken to protect topsoil from unnecessary compaction by heavy machinery. Unless otherwise approved by the Commission, topsoil must be removed before topsoil freezes in the late fall/early winter to the point that frost inhibits proper soil segregation. After backfilling with subsoil is completed, any excess subsoil must be placed over the excavation area, blending the grade into existing topography. Topsoil must be replaced over areas from which it was stripped only after the subsoil is replaced."*



2.3 REGIONAL SOILS

The majority of Golden Valley and McKenzie County is located in the Missouri Plateau. Soils in this region are generally formed from weathered sedimentary shale or glacial deposits. The regional geology typically consists of a mantle of till (when present) overlying the older residual sediments. The majority of the soils present throughout the Project would be classified as mollisols and characterized by a relatively dark, thick "A" (topsoil) horizon. The primary exception to this are entisols soils found nearer summit and shoulder-slopes of hilltops, that lack a mollic epipedon (i.e., thick A horizon). Some soils may be considered salt-affected, which have adverse properties from salinity and/or sodicity.

The main difference between topsoil and subsoil in this region is most often the presence of calcium carbonates, accumulation of salts such as sodium, and a reduction in organic matter. Calcareous subsoils can be visually distinguished by the lighter colors associated with calcium carbonates and/or a reduction in organic matter. Subsoil generally has lower organic matter content than topsoil, making it typically lighter in color. It may also have different chemical and physical properties (i.e., texture) than the topsoil.

Topsoil identification on saline or sodium affected soils (i.e., alkali or sodic soils) is sometimes less apparent solely by color, but topsoil can be distinguished by accumulations of salt, clay and/or associated structure (i.e., columnar clay pans). Salt-affected sodic soils, when tilled or disturbed, are typically hard and cloddy when dry, often coated with a visible salt crust. Accumulation of salts in the subsoil is common, and can severely restrict plant growth. The presence or absence of existing plant roots can be used as an indication between topsoil and unsuitable subsoil in certain situations, such as clay-pan subsoils.

2.4 TOPSOIL STRIPPING AND SEGREGATION BEST PRACTICES

Topsoil has biological, physical and chemical properties that are critical to successful reclamation after soil disturbances, such as pipeline installation. The surface layer of most soils is considered topsoil primarily due to its content of organic matter. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth. Topsoil, typically considered the A horizon, should be stripped to the correct depth according to natural variations in the depth of this darker layer of organic-matter-rich soil.

During pipeline preparation and excavation work, operators are to segregate topsoil and subsoil. Mixing subsoil with the topsoil can be detrimental to the re-vegetation and vegetative productivity of the soil. Hilltops and steeper sloping terrain generally have thinner topsoil layers; while lower, flatter, foot-slopes and swales typically have thicker topsoil layers. The most common exception to this is salt-affected soils, where the accumulation of salts and clay often restrict plant root growth. Equipment operators need to be aware of the natural soil landscape relationships, as well as the potential for accumulations of salts, both of which drive topsoil thicknesses, and adjust stripping depths accordingly.



2.5 INSPECTION METHODOLOGY

Stantec visually inspected the Project by driving to access points and walking or driving within the Project right-of-way (ROW). During inspections, work done by contractors/equipment operators was observed to verify that the topsoil has been properly removed, piled, and kept segregated from subsoil. A sub-meter accurate GPS paired with an iPad was used to collect photographs during the inspection. Location-referenced photographs are provided in Appendix A and Geographical Information System (GIS) generated map(s) of observation locations are provided as Figures 1-2.

Stantec shared the PSC order provisions relating to topsoil stripping, segregation, and protection with individuals present during the inspection and provided opportunity for Bridger and its contractors to ask questions on expectations for topsoil stripping depths and segregation. Stantec then toured portions of stripped ROW with Bridger and its contractors, and conducted shovel test pits to determine if topsoil strip depths were appropriate.



3.0 INSPECTION RESULTS

Topsoil removal began the day of the first inspection June 22, 2022 immediately east of the Montana border. Matt Retka, Registered North Dakota Professional Soil Classifier with Stantec, was present to ensure PSC order provisions were understood and followed.

An approximate 1/2 -mile segment of the Project ROW in Section 30, Township 144N, range 105W was stripped at the end of the first day. Stripping ended near the western side of CS creek, where steep slopes and water prevented further ROW clearing and stripping. Bridger communicated to Stantec that it plans to Horizontal Directional Drill (HDD) under CS creek, though HDD was not originally planned per the construction drawings utilized by Bridger and its contractors.

Mr. Retka requested a meeting with contractors involved with topsoil stripping on the morning of June 23, 2022 to review PSC topsoil requirements with all involved parties. Bridger's representative, and its contractors from Loenbro and Avery convened, and Mr. Retka read aloud the PSC order provision #12 related to topsoil. Mr. Retka then led a tour along the Project ROW in Section 30 to demonstrate topsoil depth variability across the landscape. A copy of the roster for this meeting is included as Appendix B. Loenbro then mobilized staff and equipment to Section 16, Township 144N, Range 105W where Stantec performed additional topsoil inspections. Other specific items discussed with Bridger and its contractors during the Topsoil Inspection included:

- Soil Segregation: Topsoil and Subsoil should be separated to the extent they do not commingle and must remain segregated until final replacement.
- Topsoil depths: The depth of topsoil can vary significantly in very short distances, sometimes making it difficult to segregate with heavy equipment. The expectation is that equipment operators attempt to adequately strip and segregate all topsoil up to 12-inches within the confines of the equipment used.
- Soil Compaction: All topsoil must be stripped or otherwise protected, using mats or other means, over the working/travel side of the ROW to mitigate topsoil compaction.
- Drainages: Steep slopes and areas proposed for "double ditching" need special consideration for topsoil handling, as there are no exceptions to the Order regarding topsoil requirements for these areas. Subsoil cannot be placed on top of topsoil and topsoil must be protected from erosion.
- Avoidance Areas: Discussed Dakota Skipper habitat and landslide prone areas. Stantec recommended Bridger and its contractors become familiar with the avoidance areas detailed in Bridger's Consolidated Application and PSC Order for the Project, as these areas are subject to review during subsequent Construction Inspections. Geological unstable areas proposed for HDD or annual inspections are outlined in Finding of Fact #21.
- ROW widths: Bridger inquired if stockpiling topsoil outside the Project ROW over Bridger's adjacent pipeline permeant easement is acceptable. Stantec responded this would not be a



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violation of the PSC Order provision #12 related to topsoil, but Stantec was unsure of other ramifications related to route provisions of the ROW and allowing work outside of the ROW could be dependent on the details of the adjacent Bridger easement with individual landowners. Stantec informed Adam Renfandt, PSC, via a phone call the morning of June 23 on this question and recommended Bridger and PSC communicate directly on this matter.

In conclusion, the Loenbro contractors did a good job with initial topsoil stripping. In flatter areas, often only topsoil needed to be stripped and stockpiled, as there is no need to strip into the subsoil prior to trenching. Initial topsoil stripped depths were determined to be insufficient along one flat area of the Project near the edge of the ROW (**Observation Point 9**) susceptible to compaction or subsoil mixing during trenching and pipe installation. Hilltop stripping required separate stockpiles of subsoil in order to create a level workspace for equipment and future pipe installation. Aside from isolated instances where subsoil was mixed slightly with stockpiled topsoil, overall, the topsoil stockpiles appeared to be kept free of subsoils.

Stantec has determined that equipment operators have demonstrated competency concerning topsoil and subsoil removal and segregation in compliance with the Commission's Order. Topsoil handling will continue to be monitored by Stantec during the subsequent construction inspection(s) and reporting. Stantec recommends that the PSC respond to Bridger's inquiry concerning topsoil stockpiling outside of the ROW and request to be informed of any new construction spreads involved with topsoil stripping not present during the June 23, 2022 compliance check.




4.0 SIGNATURE

Stantec's Project Manager and North Dakota Professional Soil Classifier, Matt Retka prepared this report.

The conclusions in this Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from the ND PSC and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the ND PSC in accordance with Stantec's contract with the ND PSC. While the Report may be provided to applicable authorities having jurisdiction and others for whom the ND PSC is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.



Matt Retka
Project Manager
Senior Soil Scientist

July 8, 2022

Date





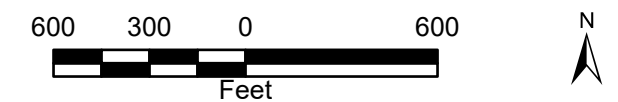
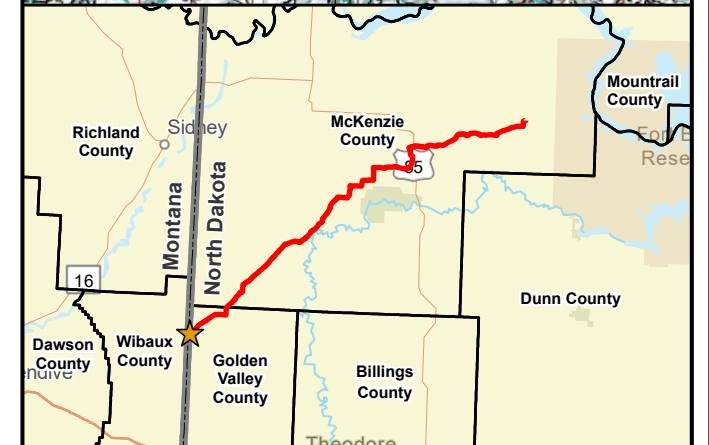
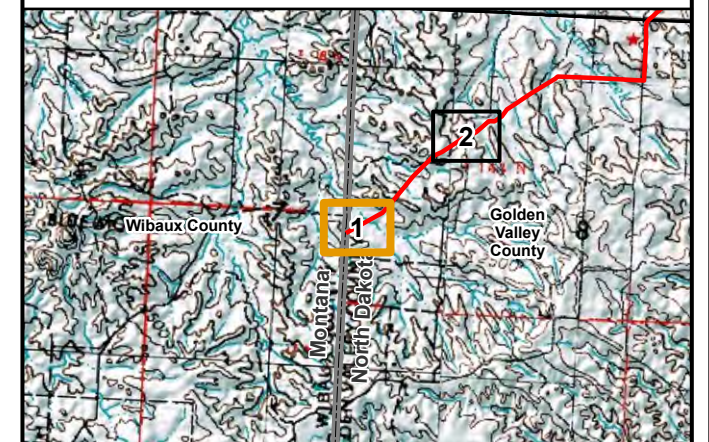
FIGURES

Figure 1-2: Topsoil Observation Locations Map

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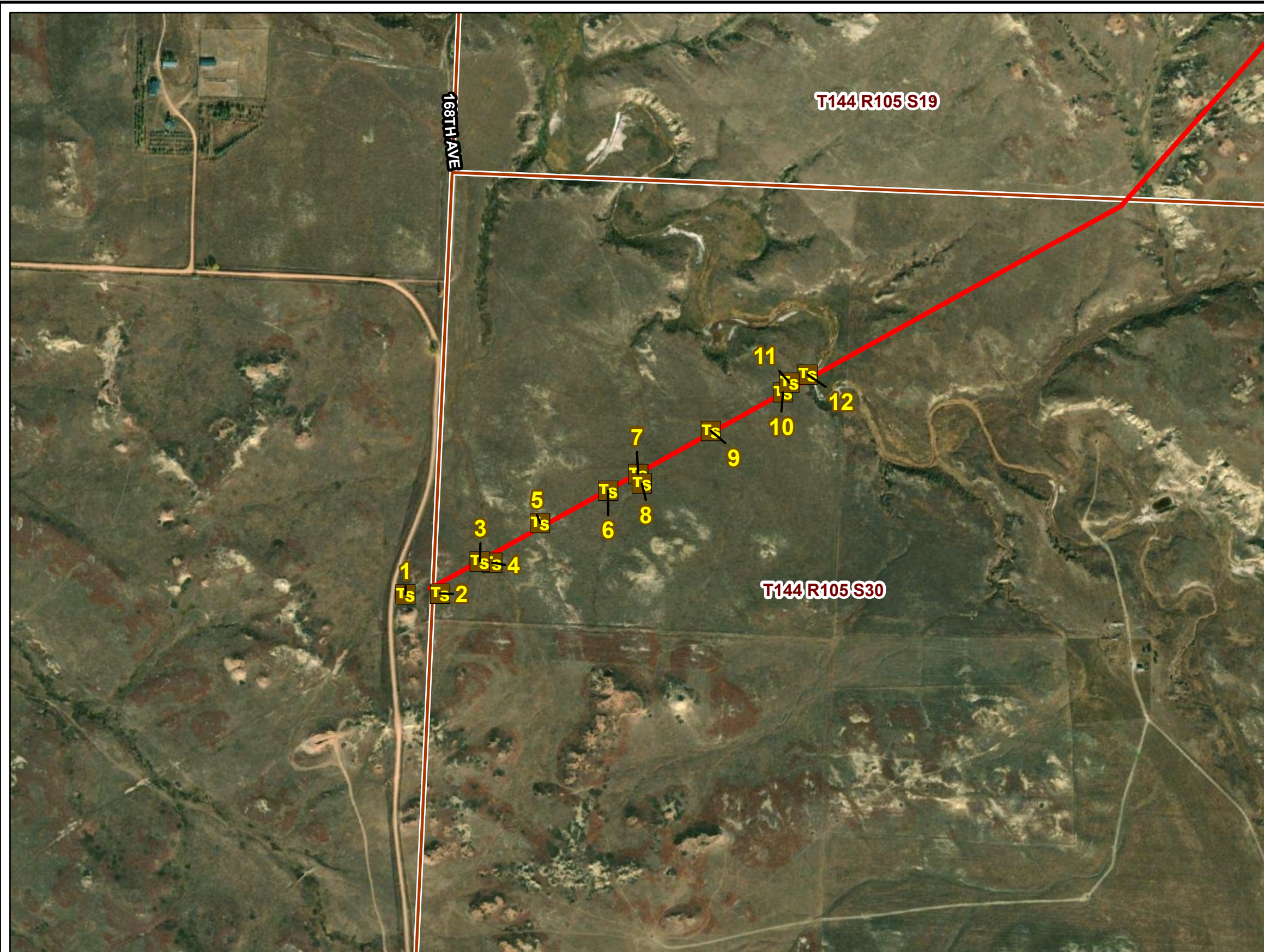
Bridger Pipeline
Figure 1

-  Topsoil Observation Point Location
-  Bridger Pipeline Centerline (PU-21-48)



ESRI World Imagery

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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Topsoil Observation Locations





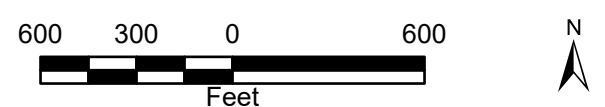
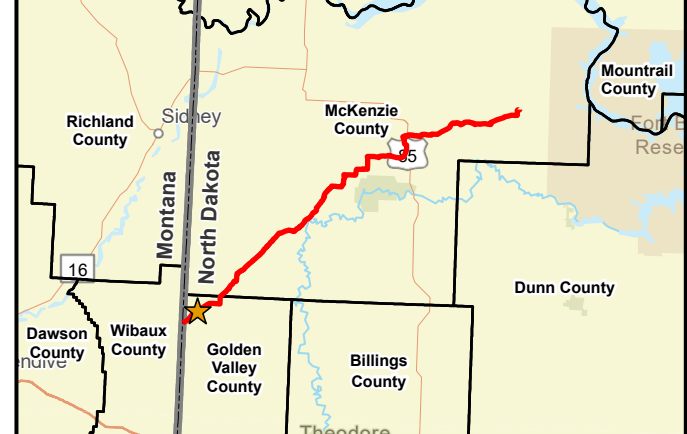
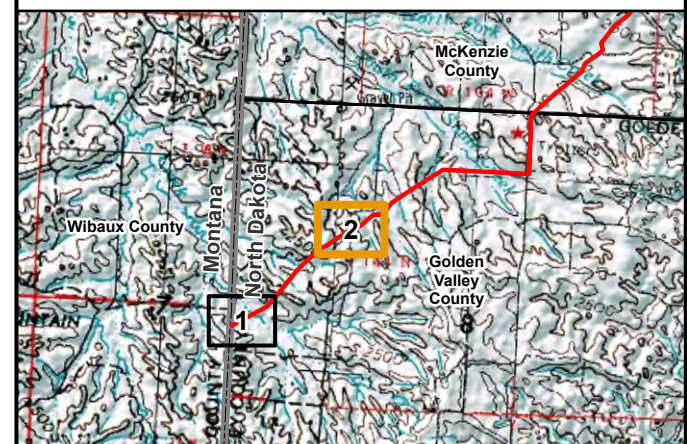
JUNE 2022

Map 1 of 2

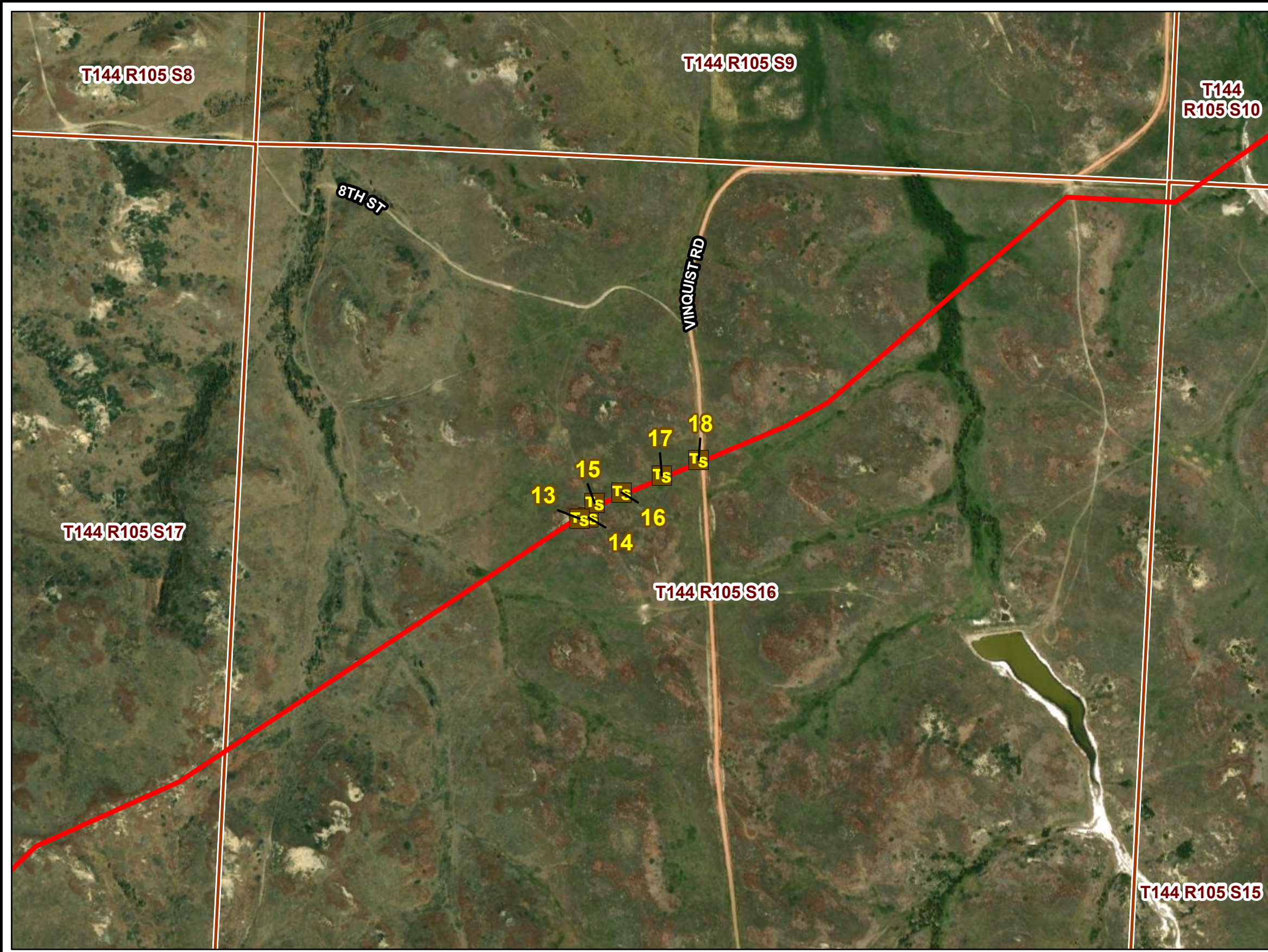
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Bridger Pipeline
Figure 2

-  Topsoil Observation Point Location
-  Bridger Pipeline Centerline (PU-21-48)



ESRI World Imagery
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PU-21-48 BRIDGER PIPELINE TOPSOIL INSPECTION

Topsoil Observation Locations



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Map 2 of 2

APPENDIX A

Observation Point Photolog

PU-21-048: Observation Point Photolog



Observation Point: 1

Date Taken: June 22, 2022

Direction Photo is Taken: Southwest
Spread:

Photo Description: Overlooking Pipeline route at the Montana border.

Latitude: 47.26212475

Longitude: -104.04541898



Observation Point: 2

Date Taken: June 22, 2022

Direction Photo is Taken: Northeast
Spread:

Photo Description: Appropriately stripped and segregated soils

Latitude: 47.26216187

Longitude: -104.0446227



Observation Point: 3

Date Taken: June 22, 2022

Direction Photo is Taken: South
Spread:

Photo Description: Minor amount of topsoil in subsoil stockpile. Discussed with crew.

Latitude: 47.26269579

Longitude: -104.04374093

PU-21-048: Observation Point Photolog



Observation Point: 4

Date Taken: June 22, 2022

Direction Photo is Taken: Northeast
Spread:

Photo Description: Good soil segregation.

Latitude: 47.26268526

Longitude: -104.04344984



Observation Point: 5

Date Taken: June 22, 2022

Direction Photo is Taken: South
Spread:

Photo Description: Limited in-situ topsoil present at this location prior to stripping.

Latitude: 47.26334398

Longitude: -104.04239191



Observation Point: 6

Date Taken: June 22, 2022

Direction Photo is Taken: Northeast
Spread:

Photo Description: 12" of topsoil stripped appropriately. No subsoil stripped.

Latitude: 47.26390063

Longitude: -104.04085348

PU-21-048: Observation Point Photolog



Observation Point: 7

Date Taken: June 22, 2022 9:37 AM

Direction Photo is Taken: North

Spread:

Photo Description: Showing centerline stake where 12"+ topsoil stripped as required.

Latitude: 47.26418413

Longitude: -104.04017795



Observation Point: 8

Date Taken: June 22, 2022

Direction Photo is Taken: Northeast

Spread:

Photo Description: Topsoil stockpile contained within ROW.

Latitude: 47.26403886

Longitude: -104.04008469



Observation Point: 9

Date Taken: June 23, 2022

Direction Photo is Taken: Southwest

Spread:

Photo Description: 12" topsoil appropriately stripped over proposed trench but only 9" stripped over working side where equipment traveled. Discussed need to strip all topsoil up to 12" susceptible to compaction or subsoil piling with contractors.

Latitude: 47.26491372

Longitude: -104.03854741

PU-21-048: Observation Point Photolog



Observation Point: 10

Date Taken: June 23, 2022

Direction Photo is Taken: Southwest
Spread:

Photo Description: Topsoil appropriately stripped over proposed trench area.

Latitude: 47.26557231

Longitude: -104.03692643



Observation Point: 11

Date Taken: June 23, 2022

Direction Photo is Taken: Southeast
Spread:

Photo Description: Straw wattle at end of stripped ROW above CS Creek.

Latitude: 47.26572884

Longitude: -104.03678901



Observation Point: 12

Date Taken: June 23, 2022

Direction Photo is Taken: Northeast
Spread:

Photo Description: Overlooking potential landslide prone Area H now proposed for HDD at CS Creek.

Latitude: 47.26586849

Longitude: -104.03637436

PU-21-048: Observation Point Photolog



Observation Point: 13

Date Taken: June 23, 2022

Direction Photo is Taken: Southwest
Spread:

Photo Description: ROW and centerline staked. No other activity taking place yet. 5" in-situ topsoil present along shoulder slope.

Latitude: 47.29212928

Longitude: -103.99538854



Observation Point: 14

Date Taken: June 23, 2022

Direction Photo is Taken: North
Spread:

Photo Description: Appropriately stripped topsoil on hilltop.

Latitude: 47.29215739

Longitude: -103.9951834



Observation Point: 15

Date Taken: June 23, 2022

Direction Photo is Taken: Northeast
Spread:

Photo Description: Photo taken from center of topsoil stockpile where topsoil is placed outside of ROW.

Latitude: 47.29238877

Longitude: -103.99505732

PU-21-048: Observation Point Photolog



Observation Point: 16

Date Taken: June 23, 2022

Direction Photo is Taken: Northeast
Spread:

Photo Description: Topsoil stripping in progress.

Latitude: 47.29257123

Longitude: -103.99444368



Observation Point: 17

Date Taken: June 23, 2022

Direction Photo is Taken: Southwest
Spread:

Photo Description: Topsoil stripping in progress.

Latitude: 47.2928678

Longitude: -103.99352705



Observation Point: 18

Date Taken: June 23, 2022

Direction Photo is Taken: West
Spread:

Photo Description: Topsoil stripped and placed 10-15' off ROW over existing Bridger pipeline.

Latitude: 47.29314134

Longitude: -103.99269294

APPENDIX B

Compliance Check Rooster Sheet

6/23/22 meeting with PSC inspector

Name & Company

Matt Retka - Stantec

ANDREW JACKSON Avery

Mike Sternitz Avery

Travis Gillett Loenbro

Tommy MASSENSACE BRIDGER

Philip Law Avery

Yanuel Cubillos Loenbro

Brian Stabelfeldt Loenbro

Dean waters Loenbro

JACK TERHUNE Loenbro

Jason Drake Loenbro

Gary Wagner Loenbro

John Jones Loenbro

Tanner Bintelen Loenbro