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Blue Mountain Midstream, LLC **Docket No. CP18-14-000**

Blue Mountain Delivery Line Project

Environmental Assessment

Washington, DC 20426

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TECHNICAL ABBREVIATIONS AND ACRONYMS

ATWS	additional temporary workspace
BMPs	best management practices
CAA	Clean Air Act
CFR	Code of Federal Regulations
Certificate	Certificate of Public Convenience and Necessity
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
Commission	Federal Energy Regulatory Commission
Cryogenic Complex	Chisholm Trail Cryogenic Gas Complex
dBA	decibels on the A-weighted scale
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EI	Environmental Inspector
EIA	Energy Information Administration
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
g	gravity
GHG	greenhouse gases
GIS	geographic information system
GWP	global warming potential
HAP	hazardous air pollutant
HDD	horizontal directional drilling
HDD Plan	*Plan for Containment of Inadvertent Release of Drilling Mud during Horizontal Directional Drilling Activities*
IR	inadvertent return
L_{dn}	day-night sound level
L_{eq}	24-hour equivalent sound level
Line 127	Enable Discharge Line 127
Line 128	Enable Discharge Line 128
MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Proposed Blue Mountain Delivery Line Project and Request for Comments on Environmental Issues*

NRCS	Natural Resources Conservation Service
NSA	noise sensitive area
NWI	National Wetland Inventory
OAS	Oklahoma Archeological Survey
OEP	Office of Energy Projects
ODEQ	Oklahoma Department of Environmental Quality
OKDWC	Oklahoma Department of Wildlife Conservation
PEM	palustrine emergent
PFO	palustrine forested
PGA	peak ground acceleration
Plan	FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan*
Procedures	FERC's *Wetland and Waterbody Construction and Mitigation Procedures*
Project	Blue Mountain Delivery Line Project
Secretary	Secretary of the Commission
SHPO	Oklahoma State Historic Preservation Office(r)
SPCC Plan	*Spill Prevention, Control, and Countermeasure Plan*
SWPPP	*Stormwater Pollution Prevention Plan*
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VOC	volatile organic compounds
WEG	Wind erodibility group

A PROPOSED ACTION

A.1 INTRODUCTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) prepared this environmental assessment (EA) to assess the environmental impacts of the proposed Blue Mountain Delivery Line Project (Project) in Grady County, Oklahoma. On November 9, 2017, Blue Mountain Midstream, LLC (Blue Mountain) filed an application with the Commission pursuant to section 7(c) of the Natural Gas Act of 1938 (NGA), as amended, (Docket No. CP18-14-000), seeking authorization to construct and operate two natural gas pipelines totaling 9.57 miles and a metering and pigging facility in Grady County, Oklahoma.[1]

We[2] prepared this EA in compliance with the requirements of the *National Environmental Policy Act of 1969* (NEPA), the Council on Environmental Quality regulations for implementing NEPA (Title 40 of the Code of Federal Regulations [CFR] 1500-1508 [40 CFR 1500-1508]), and the Commission's implementing regulations under 18 CFR 380.

The FERC is the lead federal agency for authorizing interstate natural gas transmission facilities under the NGA, and the lead federal agency for preparation of this EA. No other federal agencies elected to become cooperating agencies for the preparation of this EA.

The assessment of environmental impacts is an integral part of the Commission's decision on whether to issue Blue Mountain a Certificate of Public Convenience and Necessity (Certificate) to construct and operate the proposed facilities. Our principal purposes in preparing this EA are to:

- identify and assess potential impacts on the natural and human environment that would result from the implementation of the proposed action;
- identify and recommend reasonable alternatives to avoid or minimize adverse environmental impacts;
- identify and recommend mitigation measures, as necessary, to minimize environmental impacts; and
- facilitate public involvement in the environmental review process.

[1] A "pig" is a tool that the pipeline company inserts into and pushes through the pipeline for cleaning the pipeline, conducting internal inspections, or other purposes.

[2] "We," "us," and "our" refers to environmental staff of the Commission's Office of Energy Projects.

The EA will be used by the Commission in its decision-making process to determine whether to authorize Blue Mountain's proposal.

A.2 PROJECT PURPOSE AND NEED

Blue Mountain's stated purpose of the Project is to transport 225 million cubic feet per day of natural gas from the Chisholm Trail Cryogenic Gas Complex (Cryogenic Complex) in Grady County to an interstate pipeline transmission system, in order to supply markets in Oklahoma and neighboring states.

Under Section 7(c) of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decision on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a Project. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Project is in the public interest.

A.3 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

The topics addressed in this EA include geology and soils; groundwater, surface water, and wetlands; fisheries, vegetation, wildlife, and special status species; cultural resources; land use and visual resources; air quality and noise; reliability and safety; and cumulative impacts. The EA also assesses the no-action and route alternatives. The EA describes the affected environment as it currently exists, discusses the environmental consequences of the Project, and presents our recommended mitigation measures.

A.4 PUBLIC REVIEW AND COMMENT

On December 15, 2017, we issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Blue Mountain Delivery Line Project and Request for Comments on Environmental Issues* (NOI). The NOI was mailed to about 80 entities including federal, state, and local officials; Native American groups; agency representatives; potentially affected landowners and other interested individuals; and local libraries and newspapers. The NOI established a scoping period and requested comments on specific concerns about the Project or issues that should be considered during the preparation of the EA. The scoping period ended on January 14, 2018.

We received comment letters from the Oklahoma Archeological Survey (OAS), the Osage Nation, and the Oklahoma Department of Environmental Quality (ODEQ) in response to the NOI. The OAS letter confirmed that no sites of archeological significance are listed in the Project area. The OAS letter also stated that, based on the topographic and hydrologic setting of the Project, "archeological materials are likely to be encountered." Accordingly, the OAS letter recommended that "an archaeological

field inspection" be performed prior to Project construction "in order to identify significant archaeological resources that may exist in the Project area." The Osage Nation Historic Preservation Office stated it received notification and information of the Project and requested that a cultural resources survey be conducted. We address the OAS and Osage Nation concerns in section B.6 of the EA. The ODEQ clarified permitting authorities from construction of the Project in its letter, stating any burning associated with land clearing operations must be conducted in accordance with Oklahoma Administrative Code 252:100 Subchapter 13d and that the U.S. Environmental Protection Agency (USEPA) is the permitting authority regarding construction stormwater discharges.

A.5 PROPOSED FACILITIES

A.5.1 Description of Facilities

The Project involves the construction of two natural gas pipelines, the Enable Discharge Line 127 (Line 127) and Enable Discharge Line 128 (Line 128). Line 127 would include a 20-inch-diameter pipeline measuring 4.37 miles in length that extends from the Cryogenic Complex Blue Mountain is currently constructing, and would terminate at a metering and pigging facility (e.g., the location of the interconnect with Southern Star's Blue Mountain Chisholm Trail Project). Line 128 would include a 5.20-mile-long 12-inch-diameter pipeline that would extend from the proposed metering and pigging facility and terminate at a tie-in with an existing Enable Gas Transmission, LLC (Enable) interstate pipeline.

Blue Mountain would locate the proposed metering and pigging facility at the terminus of Line 127 (at milepost [MP] 4.37) and the beginning of Line 128 (MP 0.00). Blue Mountain would install ancillary equipment, permanent entrances from the adjacent road, and fencing with a vehicle gate and a pedestrian gate at the proposed facility. The pig launchers and receivers would be installed within the proposed metering and pigging facility and would be used to facilitate in-line inspections to ensure the integrity of Line 127 and Line 128.

The general location of the facilities is shown on figure A.5.1-1 and detailed maps are provided in appendix A.

A.6 LAND REQUIREMENTS

Construction of the Project would disturb about 81 acres of land for the aboveground facilities and the pipelines. Following construction, Blue Mountain would maintain about 38 acres for permanent operation of the Project's facilities; the remaining acreage would be restored and revert to former uses. The following subsections provide details about the land requirements for construction and operation of the pipeline and aboveground facilities for the Project.

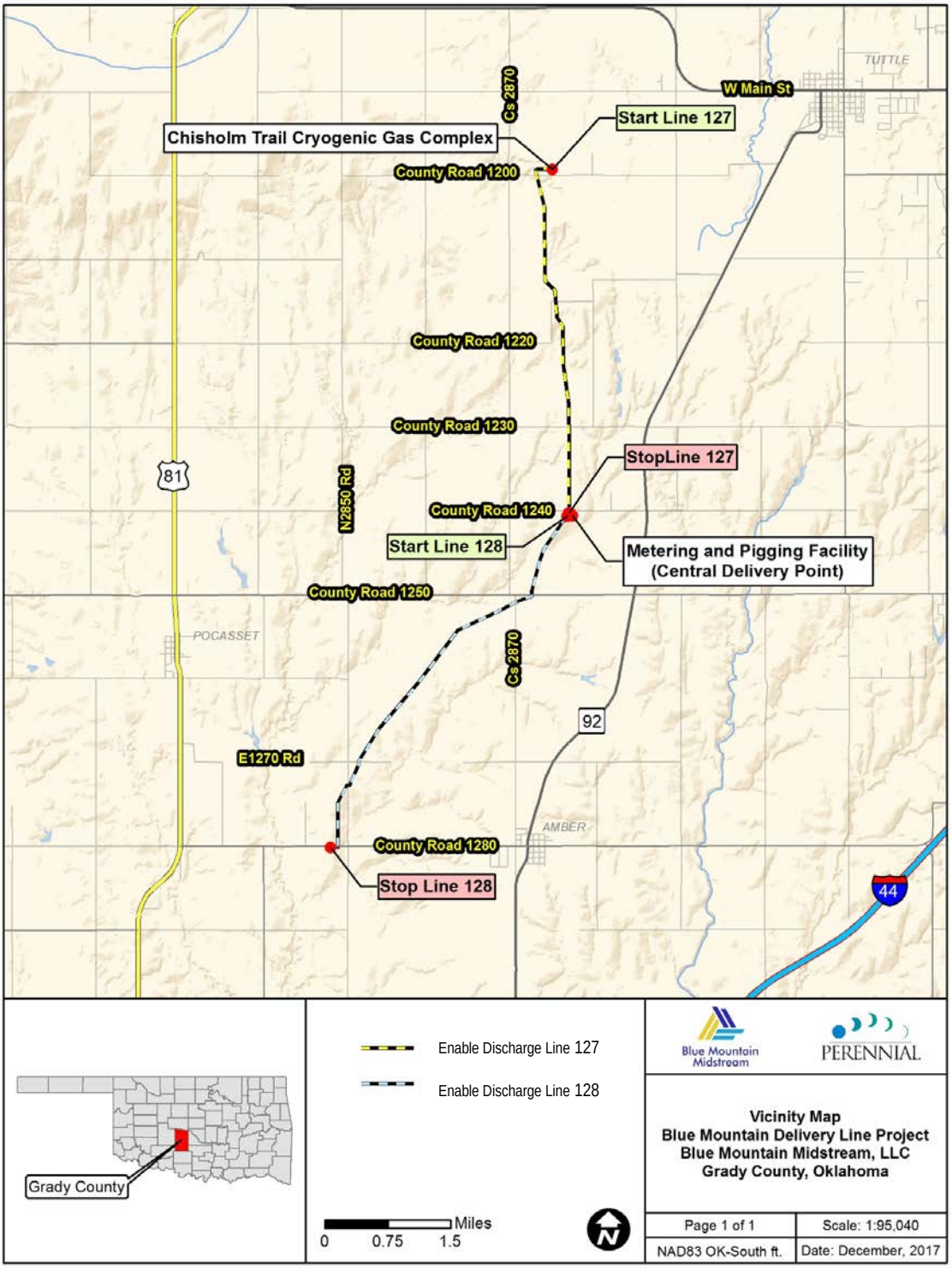

Figure A.5.1-1 Project Overview

A.6.1 Pipeline Facilities

Construction of both Line 127 and Line 128 would require a typical construction right-of-way width of 60 feet in uplands and 30 feet through wetlands and waterbodies. The construction right-of-way would be split into a 45-foot-wide working side and a 15-foot-wide spoil side, as depicted in the drawings in appendix B. Blue Mountain proposes to maintain a 30-foot-wide permanent right-of-way along the pipeline for operation and maintenance purposes, as depicted on maps provided in appendix A.

In upland areas, Blue Mountain would maintain a 10-foot-wide cleared permanent right-of-way on an as needed basis and would maintain the full permanent right-of-way every three years in accordance with our *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan). Blue Mountain would maintain a 10-foot-wide herbaceous permanent right-of-way through wetlands in accordance with our *Wetland and Waterbody Construction and Mitigation Procedures (*Procedures). In addition, trees within 15 feet of the pipeline with roots that could compromise the integrity of the pipeline coating would be selectively cut and removed from the permanent right-of-way to maintain pipeline integrity. The permanent right-of-way between the horizontal directional drill (HDD) entry and exit locations would not be impacted by construction or operation to minimize and avoid impacts on wetlands and waterbodies, per the Procedures, unless otherwise requested and approved by FERC. An exception would be the use of hand tools to clear vegetation necessary to facilitate the placement of HDD guide wires. To facilitate the proposed HDD installations, Blue Mountain would hand clear one to two paths of sufficient width, not to exceed 5 feet wide, to allow placement and surveying of an electric guide wire coil (closed loop system) along the ground surface between each HDD entry point and exit point, where possible.

HDDs are discussed further in section A.8.2.1. Following construction, Blue Mountain would restore areas that are not part of the permanent right-of-way to pre-construction conditions.

Table A.6.1-1 summarizes the approximate land requirements for construction and operation of the pipeline facilities. The specific locations and dimensions of the construction workspace, additional temporary workspace (ATWS), and access roads for the pipelines are shown on the maps provided in appendix A.

ATWS would be required to facilitate construction at road, wetland, waterbody, and foreign utility line crossings; for equipment and material storage; tie-in locations; and for topsoil segregation. In accordance with the FERC Procedures, ATWS would be set back at least 50 feet from the edge of wetlands and waterbodies. Blue Mountain would use a total of 3.9 acres of ATWS during construction; however, all ATWS would be allowed to revert to pre-construction conditions.

Table A.6.1-1 Summary of Land Requirements		
Facility	**Land Affected During Construction (acres) [a]**	**Land Affected During Operation (acres)**
Pipeline Facilities		
Line 127		
Right-of-Way	31.0	15.8
Additional Temporary Workspace	1.4	0.00
Access Roads	2.2	0.00
Line 127 Subtotal	**34.6**	**15.8**
Line 128		
Right-of-Way	36.9	18.9
Additional Temporary Workspace	2.5	0.00
Access Roads	3.8	0.00
Line 128 Subtotal	**43.2**	**18.9**
Pipeline Facilities Subtotal	**77.8**	**34.7**
Aboveground Facilities		
Metering and Pigging Facility	3.2	3.2
Aboveground Facilities Subtotal	**3.2**	**3.2**
Project Total	**81.0**	**37.9**

[a] Land affected during construction is inclusive of operation impacts (permanent).

Blue Mountain would use existing public and private road crossings along the Project, to the extent practicable, as the primary means of accessing the right-of-way. The locations of all public and private roads and major utilities crossed or otherwise utilized by the Project, as well as the proposed method of crossing are provided in table A.6.1-2. Roads include county roads, paved private roads, and maintained unpaved private roads. No permanent impacts would occur on the existing roadways or utilities Blue Mountain proposes to use or cross.

Access roads utilized during construction would allow for the passage of a wide range of vehicles including high clearance vehicles and heavy trucks. Blue Mountain would use a total of four access roads, requiring 6.0 acres of land, during construction of the Project. Existing proposed access roads include paved, graveled, or pasture roads. Blue Mountain would return temporary access roads to pre-construction conditions following completion of the Project. No new permanent access roads are proposed.

Unless otherwise requested by a landowner, it is anticipated that the existing roads would not require any modifications or improvements to allow for the safe passage of construction equipment and vehicles. Details regarding access roads that would be utilized for the pipeline facilities are provided in table A.6.1-3 and include access road ID, MP, proposed use, existing use, length, and width.

Table A.6.1-2 Road and Major Utility Crossings				
Milepost	**Road/ Utility**	**Crossing Type**	**Jurisdiction/Owner**	**Proposed Crossing Method**
Line 127				
0.15	Utility	Pipeline	Unknown	Open-cut
0.19	Utility	Pipeline	Unknown	Open-cut
0.21	Utility	Pipeline	Unknown	Open-cut
0.22	Utility	Pipeline	Unknown	Open-cut
0.25	Utility	Pipeline	Superior	HDD
0.25	Utility	Pipeline	ONEOK	HDD
0.26	Road	Leonard B Scott Rd	Unknown	HDD
1.70	Utility	Pipeline	Unknown	Open-cut
1.83	Road	CR 1220	Grady County	HDD
3.00	Utility	Pipeline	Unknown	Open cut
3.35	Road	Sooner Rd/ CR 1230	Grady County	HDD
3.90	Utility	Pipeline	Unknown	Open-cut
4.35	Road	CR 1240	Grady County	HDD
Line 128				
1.05	Road	Dutton Rd/CR 1250	Grady County	HDD
1.27	Road	N 2870 Rd	Grady County	HDD
4.01	Road	E 1270 Rd	Grady County	HDD
4.30	Utility	Pipeline	Unknown	HDD
4.33	Road	N 2850 Rd	Grady County	HDD
4.57	Utility	Pipeline	DCP	Open-cut
5.10	Road	E 1280 Rd	Grady County	HDD
5.17	Utility	Pipeline	Unknown	Open-cut

Although Blue Mountain has identified areas where extra workspace would be required, additional or alternative areas could be identified in the future due to changes in site-specific construction requirements. Blue Mountain would be required to file information on each of those areas for our review and approval prior to use.

A.6.2 Aboveground Facilities

Aboveground facilities associated with the Project include the metering and pigging facility proposed at the terminus of Line 127 and the beginning of Line 128. Operation of the metering and pigging facility would result in the permanent conversion of 3.2 acres agricultural (3.1 acres) and open land (0.1 acre) to industrial land.

Table A.6.1-3 Temporary and Permanent Access Roads						
Access Road ID	**Milepost**	**Proposed Use**	**Existing Use**	**Upgrade Requirements**	**Approximate Length (feet)**	**Approximate Width (feet)**
Line 127						
TAR-1	0.15	Temporary	Existing Gravel Road	None	347	30
TAR-2	1.40	Temporary	Existing Dirt Field Road	None	2,813	30
Line 128						
TAR-3	1.50	Temporary	Existing Dirt Field Road	None	1,134	30
TAR-4	3.09	Temporary	Existing Gravel/Dirt Road	None	4,273	30

A.7 CONSTRUCTION SCHEDULE

Blue Mountain proposes to begin construction on or near the 1st quarter of 2018, with an in-service date for all Project components on or near the 2nd quarter of 2018, pending FERC authorization. Blue Mountain would employ restoration and revegetation measures following construction per our Plan. Blue Mountain would conduct inspections to monitor the success of revegetation for a minimum of two growing seasons following construction, or until revegetation is successful.

A.8 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCEDURES

The Project would be designed, constructed, operated, and maintained in accordance with the U.S. Department of Transportation (DOT) *Minimum Federal Safety Standards* in 49 CFR 192 , *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*; the Commission's Siting and Maintenance Requirements at 18 CFR 380.15; and other applicable federal and state safety regulations.

Blue Mountain would construct the Project in accordance with our Plan and Procedures, without deviation.[3] Additionally, Blue Mountain has prepared a *Stormwater Pollution Prevention Plan,* incorporating best management practices (BMPs), industry standards, and provisions of our Plan and Procedures. To protect surface and groundwater resources from inadvertent releases of fuel and other mechanical fluids, Blue Mountain has prepared a Project-specific *Spill Prevention, Control, and Countermeasures Plan* (SPCC Plan). Blue Mountain would also implement the following construction related plans to minimize environmental impacts: *Plan for the Unanticipated Discovery of Historic Properties or Human Remains During Construction*

[3] Copies of our Plan and Procedures are available for review on the FERC website (www.ferc.gov) under the environmental guidelines for the natural gas industry at: http://www.ferc.gov/industries/gas/enviro/guidelines.asp.

and *Plan for Containment of Inadvertent Release of Drilling Mud during Horizontal Directional Drilling Activities* (HDD Plan). We have reviewed the plans and find them acceptable.

The environmental inspector (EI) would ensure that construction of the proposed facilities would comply with mitigation measures identified in this EA, the requirements of other federal and state permitting agencies, and easement agreements. The EI would be present throughout construction, and would have the authority to enforce permit conditions. The EI reports directly to Blue Mountain's Environmental Project Manager and has stop work authority. The EI's duties are contained in paragraph II.B ("Responsibilities of the EI") of our Plan.

An adequate number of copies of the Construction Drawing Package would be distributed to Blue Mountain's inspectors and to contractor's supervisory personnel. If the contractor's performance is unsatisfactory, the terms of the contract allow Blue Mountain to stop work in progress and cause a contractor to begin remedial work.

Commission staff would also conduct environmental compliance inspections throughout construction and restoration activities, to confirm compliance with the Commission's orders and confirm that restoration and revegetation are successful.

A.8.1 General Pipeline Construction Sequence

Blue Mountain would use conventional open-cut pipeline construction techniques for the majority of the Project. Construction would require one to two construction spreads, and would consist of phased construction conducted in a sequential manner. The entire process would be coordinated to minimize the total time a tract of land is disturbed and therefore, exposed to erosion and/or temporarily precluded from its normal use. General construction and installation procedures are described in the following sections.

Surveying and Staking

Blue Mountain would notify affected landowners before pre-construction civil surveys and staking are conducted. After these notifications, a crew would survey and stake the outside limits of the proposed construction right-of-way and ATWS, the centerline of the pipeline, and access roads. Existing utility lines (e.g., cables, conduits, and pipelines) would be marked with flags, stakes, or other devices to prevent accidental damage during pipeline construction.

Erosion and Sedimentation Control

Temporary soil erosion and sedimentation control measures would be installed along the proposed construction right-of-way, ATWS, access roads, and other work areas, as applicable, in accordance with Blue Mountain's *Stormwater Pollution Prevention Plan*, our Plan and Procedures, and any permit specific requirements.

Clearing and Grading

Following installation of erosion and sedimentation control measures, the right-of-way would be cleared of vegetation and debris. Blue Mountain would dispose of cleared vegetation and debris in accordance with federal, state, and local regulations at a commercial disposal facility. The right-of-way would then be graded, where necessary, to create a level working surface to allow safe passage of equipment and personnel.

Trenching

Trenching involves excavation of a ditch for pipeline placement, and is accomplished through the use of a trenching machine, backhoe, or similar equipment. Blue Mountain would place trench spoil adjacent to the trench with topsoil segregation utilized in unsaturated wetlands, agricultural and residential areas, and where requested by the landowner, in accordance with our Plan and Procedures. Generally, Blue Mountain states it would excavate the trench to a depth of about 6 feet to ensure a minimum of 4 feet of cover over the pipe, which exceeds the minimum standards outlined in 49 CFR 192. Typically the bottom of the trench would be at least 12 inches wider than the width of the pipe. The width at the top of the trench would vary to allow the side slopes to be adapted to local conditions at the time of construction. Trenching may be performed either before or after stringing, bending, and welding.

Pipe Stringing, Bending, and Welding

The new pipe would be placed (or "strung") along the right-of-way parallel to the trench. Depending on available workspace, some pipe may be fabricated off-site and transported to the right-of-way in differing lengths or configurations. Pipe would be bent by hydraulic bending machines, as necessary, to conform the pipe to the trench. Once in place along the right-of-way, pipe lengths would be aligned, bends fabricated, and joints welded together. Blue Mountain would perform welding in accordance with the American Petroleum Institute Standard Number 1104, DOT pipeline safety regulations, 49 CFR 192, and company welding specifications. All welds would be coated for corrosion protection and visually and radiographically inspected to ensure there are no defects, as required by 49 CFR 192. Additionally, the entire pipeline would be visually inspected prior to lowering in.

Pipeline Installation and Trench Backfilling

Side boom tractors, or similar equipment, would lift the strung pipe and place it into the trench. Prior to lowering-in the pipe, the trench would be visually inspected to ensure that it is free of rock and other debris that could damage the pipe or coating. Blue Mountain would then backfill the trench (ensuring to replace any segregated topsoil last).

Hydrostatic Testing

Following backfilling of the trench, Blue Mountain would hydrostatically test the pipeline to ensure that the system is free from leaks and is capable of safely operating at the design pressure. Hydrostatic testing would be conducted in accordance with the requirements of DOT pipeline safety regulations, 49 CFR 192, company testing specifications, and applicable state general discharge permits.

During testing, the water in the pipe would be pressurized above the maximum operating pressure and held for a minimum of eight hours. Blue Mountain would investigate any loss of pressure that cannot be attributed to other factors, such as temperature changes. In the event that a loss of pressure is detected, the pipeline would be repaired and the segment retested. Information regarding hydrostatic testing including withdrawal sources, volumes, and discharge locations is provided in section B.3.2.

Restoration and Clean-up

Once pipeline installation and backfilling is complete, Blue Mountain would restore and grade disturbed areas to pre-construction contours in accordance with our Plan and Procedures. Construction debris and organic refuse unsuitable for distribution over the right-of-way would be disposed of at appropriate facilities in compliance with applicable regulations. Blue Mountain would install and maintain permanent erosion and sediment control measures and revegetate the disturbed area in accordance with our Plan and Procedures or specific landowner requests.

A.8.2 Special Pipeline Construction Procedures

In addition to conventional construction techniques, Blue Mountain would use specialized techniques in sensitive resource areas, including waterbody crossings, wetland crossings, agricultural areas, road crossings, and utility crossings. Specialized construction procedures are described below.

A.8.2.1 Waterbody Crossings

Open Cut

The open cut crossing method employs the same general construction procedures that were described above for mainline construction. Equipment would operate from the banks of the waterbody to the maximum extent practicable to excavate a trench. As required by our Procedures, flow would be maintained at all times. Excavated material from the trench would be placed on the bank above the ordinary high water mark for use as backfill. Blue Mountain would prefabricate and weight the pipe segment, as necessary, to provide negative buoyancy and placed below the scour depth. Blue Mountain would install the pipeline with a minimum of 4 feet of cover, unless otherwise required by applicable federal, state, or local permits. Contours would then be restored

within the waterbody, and the banks stabilized via seeding and/or the installation of erosion control matting or riprap. Excess excavated materials would be distributed in an upland area in accordance with applicable regulations or disposed of at an approved facility. A detailed description of the potential impacts on waterbodies and water quality, as well as the measures that Blue Mountain would implement to minimize these impacts, is provided in section B.3.2.

Horizontal Directional Drill

Blue Mountain proposes to use the HDD crossing method for certain waterbody and wetland crossings as well as road crossings. The HDD method allows for construction across a waterbody, wetland, or road without the excavation of a trench by drilling a hole below the resource, and pulling the pipeline through the pre-drilled hole. Proposed HDD locations for the Project are provided in table A.8.2-1.

The drilled crossing lengths shown in table A.8.2-1 are estimated based on assumed crossing profiles and depths. The depth of the proposed HDDs associated with the Project would be significantly less than that of typical HDDs utilized for large waterbody/highway crossings due to the length of the proposed crossings.

Table A.8.2-1
Proposed Locations of Horizontal Directional Drill Operations

Name of HDD	Milepost		Length (feet)
	Entry	Exit	
Line 127			
HDD 1 (Pipeline and Leonard B Scott Road)	0.22	0.29	342
HDD 2 (Unnamed Tributary of Salt Creek)	1.33	1.41	400
HDD 3 (County Road 1220)	1.80	1.86	330
HDD 4 (Sooner Road/County Road 1230)	3.32	3.38	280
HDD 5 (County Road 1240)	4.32	4.40	280
Line 128			
HDD 6 (Unnamed Tributary of Salt Creek and Wetland WP1GR002)	0.51	0.59	410
HDD 7 (Dutton Road/County Road 1250)	1.04	1.07	208
HDD 8 (Unnamed Tributary of Salt Creek and N 2870 Road)	1.25	1.33	400
HDD 9 (E 1270 Road)	3.99	4.04	244
HDD 10 (Pipeline and N 2850 Road)	4.30	4.37	237
HDD 11 (Unnamed Tributary of Salt Creek and E 1280 Road)	5.07	5.11	355

Blue Mountain would utilize a small drill rig (such as a Vameer 100 or similar) to perform the proposed HDDs. Following the completion of the pilot hole, reaming tools would be utilized to enlarge the hole to accommodate the pipeline diameter. The reaming tools would be attached to the drill string at the exit point and would then be rotated and drawn back to incrementally enlarge the pilot hole. During this process, drilling mud

consisting of bentonite clay and water would be continuously pumped into the pilot hole to remove cuttings and maintain the integrity of the hole (sources and volumes of water for drilling mud are further discussed in section B.3.2). When the hole has been sufficiently enlarged, a prefabricated segment of pipe would be attached behind the reaming tool on the exit side of the crossing and pulled back through the drill hole towards the drill rig. In the event that an inadvertent return (IR) of drilling fluid were to occur during the HDD, Blue Mountain would implement its *Plan for Containment of Inadvertent Release of Drilling Mud during Horizontal Direction Drilling Activities*. All drilling activities would be limited to daylight hours unless there is a risk of the drill failing as a result of stopping each night.

A.8.2.2 Wetland Crossings

Operation of construction equipment through wetlands would be limited to only that necessary for each stage of pipe installation (e.g., clearing, trenching, etc.). Blue Mountain would segregate the trench's topsoil in unsaturated wetlands to preserve the seed bank and allow for successful restoration of the disturbed area following completion of Project activities. Blue Mountain would monitor disturbed wetlands post-construction to ensure successful revegetation. To further minimize impacts on wetlands, refueling would not be conducted, and fuel would not be stored, within 100 feet of wetlands unless otherwise approved by the EI(s).

Of the two proposed wetland crossings, one would be performed using the HDD method as described previously. The other wetland crossing would be accomplished via a conventional lay in accordance with all applicable permits and our Procedures. Construction techniques for this method are similar to the open-cut method in upland areas; however, Blue Mountain would segregate topsoil in unsaturated wetlands to facilitate revegetation following the completion of construction activities and would ensure that it minimizes the length of time that topsoil is segregated and the trench is open. Where site-specific conditions may not support construction equipment, but the area would still be crossed using the conventional lay method, Blue Mountain would use construction mats to minimize disturbances to wetland hydrology and maintain soil structure.

A.8.2.3 Road and Utility Crossings

Paved roads and utility line crossings (including pipelines and electrical lines) along the Project would be crossed by the open-cut or HDD method. Safe and accessible conditions would be maintained during construction at road crossings per our Plan. Blue Mountain would typically conduct road crossings within one day to minimize the interruption of traffic. Typically, a minimum of 7 feet of cover over the pipe would be maintained at all road crossings (paved and unpaved). Blue Mountain would provide additional depth of cover where required to ensure that the minimum depth of cover over the pipe is in accordance with all federal, state, and local regulations for pipeline

crossings. Pipeline warning signs and/or markers would be used to identify the presence of a pipeline at each crossing. Furthermore, Blue Mountain would install cathodic protection test stations in proximity to all public roads and foreign pipeline crossings, and at other needed locations, to monitor the performance of the cathodic protection system.

Prior to construction, Blue Mountain would request meetings with representatives of each foreign utility line operator to inform them of the Project, obtain their requirements for crossing their utility line, and to solicit their cooperation in facilitating safe crossings. In areas where either Line 127 or Line 128 would cross an existing utility line, Blue Mountain proposes a minimum of 18 inches separation between the existing utility line and the proposed pipelines. Mechanical excavation would be restricted in proximity to the existing pipelines being crossed. Blue Mountain would have inspectors present to monitor all crossing installations. Foreign utility line operators would also be afforded the opportunity to have a representative on-site. Although not anticipated, should an accident occur and a foreign utility be damaged during construction, Blue Mountain would stop work immediately and notify all appropriate personnel and local first responders, as needed.

A.8.2.4 Agricultural Areas

Blue Mountain would implement topsoil segregation in active croplands, pastures, and hayfields per our Plan. A maximum of 12 inches (in deep soils) of topsoil would be removed and separated from the subsoil during construction. Following pipeline installation, the subsoil would be backfilled followed by the topsoil. Agricultural land would be returned to original contours to maintain pre-construction hydrology. Should construction result in any new drainage or ponding issues, Blue Mountain would work with the landowner to remedy the problem.

A.8.3 Aboveground Facilities Construction and Operation Procedures

Construction of the metering and pigging facility would be concurrent with construction of pipeline facilities. The site would be cleared, graded, and soils would be leveled and compacted for placement of foundations. Blue Mountain would compact any soils excavated for the placement of the foundations in place and excess soil would be utilized elsewhere on site or disposed of in an approved offsite location. Fencing would be constructed around the facility. High strength concrete, reinforced as necessary, would be utilized for foundations associated with major equipment.

Blue Mountain would assemble and weld the pipe and other equipment on site. Aboveground and below ground piping would be installed and hydrostatically tested prior to operation. Gravel fill, asphalt, or concrete would be used to construct facility entrances and a parking area. Upon completion of construction activities, Blue Mountain would finish grade and seed disturbed areas that have not been paved or covered with gravel in accordance with our Plan or specific landowner requests. The metering and

pigging facility would be capable of being remotely monitored via cellular or radio communications for the supervisory control and data acquisition (SCADA) system.

A.9 NON-JURISDICTIONAL FACILITIES

Under Section 7 of the NGA, FERC is required to consider, as part of its decision to certificate jurisdictional facilities, related non-jurisdictional facilities that would be constructed in association with a project. These may be integral to the purpose of a project (e.g., facilities necessary to deliver, receive, or use the proposed gas volumes) or they may be minor, non-integral components of the jurisdictional facilities (e.g., a powerline to service an aboveground facility). At this time, non-jurisdictional facilities necessary to operate the Project are anticipated to include the addition of new power lines and associated facilities. Blue Mountain is continuing to work with local power providers.

FERC has no authority over the permitting, licensing, funding, construction, or operation of local electric lines. The power lines are part of private construction projects under state and local jurisdiction, and it is anticipated that each power provider would obtain all necessary federal permits and approvals prior to construction of the nonjurisdictional electric lines. The federal government has no financial involvement and no federal lands are involved, thus no cumulative federal control and responsibility is associated with these non-jurisdictional facilities.

Environmental impacts associated with the construction of the non-jurisdictional power lines to the jurisdictional facility is disclosed and impacts associated with the power line have been captured in section B.9 Cumulative Impacts.

In addition to the power lines, the Cryogenic Complex is also a related non-jurisdictional facility. The proposed Project would transport newly processed gas from the Cryogenic Complex to the interstate pipeline transmission system and would ultimately contribute an additional 225 million cubic feet per day of natural gas supply to markets in Oklahoma and neighboring states. Environmental impacts associated with the construction of the non-jurisdictional Cryogenic Complex is disclosed in section B.10 Related Facilities.

A.10 PERMITS, APPROVALS, AND REGULATORY CONSULTATIONS

Table A.10-1 lists the major federal, state, and local permits, approvals, and consultations for construction and operation of the Project and provides the current status of each. Blue Mountain would be responsible for obtaining and abiding by all permits and approvals required for construction and operation of the Project.

TABLE A.10-1 Permits, Approvals, and Consultations for Construction and Operations		
Agency or Organization	**Permit/Approval**	**Submittal/Anticipated Submittal**
Federal		
Federal Energy Regulatory Commission	Limited Jurisdiction Certificate, Blanket Authorization, and Request for Waivers	Application filed November 7, 2017
U.S. Army Corps of Engineers – Tulsa District	Section 404 *Clean Water Act*	Automatic authorization under Nationwide Permit (NWP) 12 without submittal of a Pre-construction Notification (PCN)
U.S Fish and Wildlife Service – Oklahoma Ecological Services Field Office	Section 7 *Endangered Species Act*	Concurrence issued on December 18, 2017
Various Native American Tribes	Tribal Cultural Consultations	Letters submitted September 18, 2017
State		
Oklahoma Department of Environmental Quality	Section 401 Water Quality Certification	Automatic with authorization of Project under NWP 12
Oklahoma Water Resources Board	Provisional Temporary Water Use Permit	Anticipated submittal February 2018
Oklahoma Historical Society	Section 106 *National Historic Preservation Act*	Concurrence issued on December 14, 2017
Oklahoma Archeological Survey	Section 106 *National Historic Preservation Act*	Concurrence issued on December 7, 2017

SECTION B – ENVIRONMENTAL ANALYSIS

In the following sections, we address the affected environment, general construction and direct and indirect operational impacts, and proposed mitigation to minimize or avoid impacts for each resource. Section B.9 of this EA analyzes the Project's contribution to cumulative impacts.

When considering the environmental consequences of the Project, the duration and significance of any potential impacts are described below according to the following four levels: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction, with the resources returning to pre-construction conditions almost immediately. Short-term impacts could continue for up to three years following construction. Long-term impacts would require more than three years to recover, but eventually would recover to pre-construction conditions. Permanent impacts could occur because of activities that modify resources to the extent that they may not return to pre-construction conditions during the life of the Project, such as with the construction of an aboveground facility. An impact would be considered significant if it would result in a substantial adverse change in the physical environment.

Blue Mountain, as part of its proposal, agreed to implement certain measures to reduce impacts on environmental resources. We evaluated the proposed mitigation measures to determine whether additional measures would be necessary to reduce impacts. Where we identify the need for additional mitigation, the measures appear as bulleted, boldfaced paragraphs in the text. We will recommend that these measures be included as specific conditions to any authorization that the Commission may issue to Blue Mountain.

B.1 GEOLOGY

The Project is in central Oklahoma within the Osage Plains section of the Central Lowland physiographic province (U.S. Geological Survey [USGS], 2017a). The Osage Plains section is characterized by a series of broad escarpments that generally extend northeast to southwest and separate level to gently rolling plains (U.S. Forest Service, 1996). The topography across the Project area is generally flat with low and gently sloping hills. Elevations across the Project range from approximately 1,150 feet to 1,350 feet above mean sea level (ft, amsl) but average between 1,210 and 1,290 ft, amsl. The primary lithology of the Project vicinity is sandstone, sand, and shale with secondary gravel (USGS, 2017b).

Oklahoma's primary non-fuel mineral resources are crushed stone, cement, and sand and gravel. A search of oil and gas production and non-fuel mineral resources in the Project vicinity utilizing the Oklahoma Corporation Commission's oil and gas well data system (Oklahoma Corporation Commission, 2017), the USGS Mineral Resource Data System (USGS, 2017c), and information available from the U.S. Energy Information

Administration (U.S. Energy Information Administration 2016, 2017) showed that there are:

- five active gas wells within 0.25 miles of proposed Project facilities, with the nearest 213 feet from MP 0.04 of Line 127;
- no inactive or abandoned oil or gas wells within 0.25 miles of the proposed Project; and
- no non-fuel mineral resources or underground natural gas storage reservoirs within 1 mile of the proposed Project.

We conclude that Project construction and/or operational impacts on fuel and non-fuel mineral resources would not occur given the distance to the nearest of these resources.

Paleontological resources are the fossilized remains of prehistoric plants and animals, as well as impressions left in rock or other minerals. Common fossils in Oklahoma include Paleozoic-age brachiopods, trilobites, molluscs, insects, amphibians, reptiles, and vertebrate footprints (The Paleontology Portal, 2017). There are no federal laws or regulations that protect paleontological resources on private lands, and fossils are not common in the Project area (Larsen, 2017). However, if paleontological resources were discovered during construction, Blue Mountain has agreed to temporarily cease excavation in the area and notify the relevant local and state agencies as well as FERC. Therefore, no adverse impacts on paleontological resources are anticipated.

B.1.1 Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Such hazards typically are seismic-related, including earthquakes, surface faulting, and soil liquefaction; landslides, flooding, and karst terrain; or ground subsidence hazards. These hazards, as well as the feasibility of utilizing HDD, based on hydrogeologic conditions present in the Project area, and the potential for an IR of drilling fluid to the surface during HDD activities are discussed below.

The shaking during an earthquake can be expressed in terms of the acceleration as a percent of gravity (g), and seismic risk can be quantified by the motions experience at ground surface or by structures during a given earthquake expressed in terms of g. USGS National Seismic Hazard Probability Mapping shows that for the Project area, within a 50-year period, there is a 2 percent probability of an earthquake with an effective peak ground acceleration (PGA) of 20 to 30 percent g; and a 10 percent probability of an earthquake with an effective PGA of 6 to 7 percent g being exceeded (USGS, 2014a). For reference, PGA of 10 percent g (0.1g) is generally considered the minimum threshold for damage to older structures or structures not constructed to resist earthquakes. A 6 to

7 percent PGA is characterized as moderate perceived ground shaking and very light potential damage, and a 20 to 30 percent PGA is associated with very strong perceived ground shaking and moderate potential damage (USGS, 1989).

Earthquake magnitude and intensity measure different characteristics of earthquakes. Magnitude measures the energy released at the source of the earthquake and is determined from measurements on seismographs. Intensity measures the strength of shaking produced by the earthquake at a certain location. Intensity is determined from effects on people, human structures, and the natural environment (USGS, 1989).

Since 1882, at least 357 earthquakes have occurred within Grady County. None of these earthquakes had a magnitude above 3.5 (equivalent Richter scale), or a Modified Mercalli Intensity (MMI) of II - III. Six of these earthquakes occurred within one mile of the Project and ranged in magnitude from 1.8 (MMI I) to 3.2 (MMI II/III) (Oklahoma Geological Survey, 2017). Earthquakes of these magnitude and intensity have minimal to no resulting damage.

In general, modern electric arc welded steel pipelines have not sustained damage during seismic events except due to permanent ground deformation (for example, due to fault displacement), or traveling ground-wave propagation greater than or equal to a Richter magnitude of 6 (MMI VII). According to fault maps produced by the Oklahoma Geological Survey, faults would be crossed by the Project at MP 0.36 of Line 128, and MP 1.37, MP 2.32, and MP 3.66 of Line 127 (Oklahoma Geological Survey, 2015 and 2016). However, the USGS does not classify any of the mapped faults in Grady County as active (i.e., displacement has not occurred along the fault within the last 10,000 years) (USGS, 2006).

Earthquake activity in parts of the Central and Eastern United States, including Oklahoma, has significantly increased in recent years. The space and timing of these events indicate anthropogenic origins, principally driven by deep injection of wastewater that is co-produced with oil and gas production and disposed of into underground injection wells. No such injection wells are within 1 mile of proposed Project facilities (Oklahoma Corporation Commission, 2017).

Recent research conducted by the USGS investigated the occurrence and magnitude of injection wastewater-induced earthquakes. Within 10 miles of the Project area, eleven earthquakes were attributed to induced seismicity and occurred from January 2009 to October 2016. These eleven earthquakes ranged from 2.55 (MMI I) to 3.08 (MMI II) in magnitude (USGS, 2017d). Earthquakes of these magnitude and intensity have minimal to no resulting damaging.

To mitigate seismic hazards, all Project facilities would be built to meet or exceed the seismic design provisions of the Pipeline and Hazardous Materials Safety Administration, and applicable state and local guidelines. During operations, Blue

Mountain would continuously monitor publically available data regarding the occurrence of earthquakes near the Project facilities. In the event that an earthquake does occur in the vicinity of the Project, Blue Mountain would monitor pressure along the pipeline for any changes. If pressure changes are noted, Blue Mountain would stop all operations along the pipeline, and would investigate to determine the cause of the pressure changes. Based on the implementation of these measures and the magnitude and intensity of recent and historic seismic activity in the region, including induced seismic activity, we conclude the Project is not likely to be adversely impacted by future seismic incidents.

Soil liquefaction is a phenomena associated with seismic activity in which saturated, non-cohesive soils temporarily lose their strength and liquefy (i.e., behave like a viscous liquid) when subjected to forces such as intense and prolonged ground shaking. Although the Project lies within an area of moderate seismicity, Project area soils are well-drained and are not prone to near surface saturation. As such, the potential for soil liquefaction to occur is negligible.

USGS landslide incidence and susceptibility mapping indicates that the Project facilities would be located in areas of low landslide incidence (USGS, 2014b). This is reflective of the generally flat or gently sloping topography in the Project area. As such, the potential for landslides to occur during construction or operation of the Project is negligible.

Ground subsidence, involving the localized or regional lowering of the ground surface, may be caused by karst formation due to limestone or gypsum bedrock dissolution; sediment compaction due to groundwater pumping and/or oil and gas extraction, and underground mining. Oil and gas extraction occurs in the Project vicinity; however, there have been no reported subsidence hazards as a result of these activities. Subsurface mines do not occur in the Project area and Project areas do not overlie unconsolidated aquifers susceptible to subsidence from excessive pumping; no karst terrain is present and the lithology that could lead to bedrock dissolution and karst development do not generally occur within the Project area. As such, the potential for ground subsidence to occur is negligible.

Construction of the Project could be impacted by flash flooding due to its proximity to streams, rivers, and other nearby waterbodies. Approximately 0.1 mile of the proposed Project, from Line 128 MP 0.47 to MP 0.57, is within the 100-year floodplain (A Zone) as determined by the Federal Emergency Management Agency. A Zones are subject to inundation by the 1 percent chance of an annual flood event

Flooding is not expected to impact operation of the pipeline, as it would be installed subsurface and land surface contours would be restored following the completion of construction activities. The pipeline would also be installed below the scour depth with a minimum of four feet of cover at all waterbody crossings. Therefore, we conclude flooding and scour hazards would not impact the Project facilities.

Blue Mountain has proposed the use of the HDD construction method to cross nine roads, six waterbodies and one wetland. During HDD operations, bentonite-based drilling mud is pumped under pressure through the inside of the drill pipe and flows back (returns) to the drill entry point along annular space between the outside of the drill pipe and the drilled hole. Because the drilling mud is pressurized, it can be lost, resulting in an IR, if the drill path encounters porous material and/or fractures or fissures in the bedrock. Chances for an IR to occur are greatest near the drill entry and exit points where the drill path has the least amount of ground cover. It is also possible for HDD operations to fail, primarily due to encountering unexpected geologic conditions such as coarse materials or if the pipe were to become lodged in the hole during pullback operations.

While use of the HDD method would significantly minimize potential impacts on the proposed crossings of waterbodies and wetlands, HDDs could result in an unanticipated release of drilling fluids into a waterbody or wetland during drilling. To minimize the potential impacts of an IR, Blue Mountain has committed to use drilling fluid consisting of only bentonite and water (no chemical additives would be used) and would implement its HDD Plans. Blue Mountain's HDD Plans would ensure that drill operations are monitored and adjusted to avoid potential IRs, and if one should occur, the release would be contained to the extent practicable and remediated. We have reviewed Blue Mountain's HDD Plans and find them acceptable. However, Blue Mountain has not submitted geotechnical documentation or a feasibility assessment/hydrofracture calculations verifying that proposed drills have been designed to minimize the potential for IRs; therefore, **we recommend that:**

- **<u>Prior to construction</u>, Blue Mountain should file with the Secretary of the Commission (Secretary) the following information for HDD alignments crossing wetlands or waterbodies (HDD-2, -6, -8, & -11):**
  - **a. the results of site-specific geotechnical investigations conducted;**
  - **b. a description of the subsurface lithology along the drill path, standard penetration test (SPT) results, soil mechanic properties/Atterberg Limits, and/or rock coring results including core recovery, and rock quality designation (RQD) for each bedrock core run (depict the lithology, SPT and RQD data on each HDD profile);**
  - **c. an HDD feasibility study conducted by a qualified contractor including an analysis of the potential for hydrofracture and an IR using the U.S. Army Corps of Engineers (USACE) Delft method for crossings through unconsolidated material, and/or a qualitative analysis for an IR through bedrock utilizing RQD values obtained from bedrock cores.**

Based on the construction methods and mitigation measures, and our recommendation above, we conclude that the impact from geologic hazards on the Project facilities during construction and/or operation would be minimal and the Project would not have significant impacts on geologic resources.

B.2 SOILS

Soil characteristics in the Project area were assessed using the Natural Resources Conservation Service (NRCS) Soil Survey geographic database (NRCS, 2017). Project area soils consist predominantly of well drained silt loams with slopes ranging from 0 to 12 percent. Project area soils are not hydric, but exhibit high rutting and moderate compaction potential. The majority of soils have moderate to high revegetation potential and moderate to high erosion potential. Approximately 30 percent of the soils that would be crossed by Line 127 and 38 percent of the soils that would be crossed by Line 128 are underlain by shallow bedrock (bedrock 60 inches or less from the ground surface). The Project construction would disturb 43.2 acres classified as prime farmland and 66.9 acres of land currently in agricultural use.

Typical soil impacts that may occur during construction include mixing of topsoil and subsoil layers, compaction, rutting, erosion, and alteration of drainage characteristics. Construction activities such as clearing, grading, trench excavation, backfilling, heavy equipment traffic, and restoration along the construction right-of-way have the potential to adversely affect natural soil characteristics such as water infiltration, storage and routing, and soil nutrient levels, thus reducing soil productivity. Clearing removes protective vegetative cover and exposes soils to the effects of wind and water which potentially increases the potential for soil erosion and the transport of sediment to sensitive resource areas.

Prime Farmland

The United States Department of Agriculture (USDA) defines prime farmland as land that has the best combination of physical and chemical characteristics for the production of food, feed, fiber, and oilseed crops. Construction in agricultural and pasture areas would temporarily disrupt ongoing agricultural activities and eliminate use of the land for the duration of construction, and permanently impact areas 3.1 acres converted to industrial use.

Following construction, Blue Mountain would allow agricultural activities to resume without restrictions except at the proposed metering and pigging facility. Potential impacts on agricultural soils would be minimized and mitigated in accordance with our Plan and the special construction procedures described in section A.8.2.5. These include measures to conserve and segregate the upper 12 inches of topsoil, alleviate soil compaction, protect and maintain existing drainage tile and irrigation systems, prevent the introduction of weeds, and retain existing soil productivity, thereby minimizing the

potential for long-term impacts on agricultural lands. Therefore, we conclude that the majority of impacts on prime farmland would be temporary and not significant.

Permanent impacts on prime farmland would be limited to soils within the footprint of the metering and pigging facility (2.9 acres of Bethany silt loam) which quantitatively represent less than 0.01 percent of the total area of prime farmland within Grady County. Impacts on prime farmland from construction and operation of aboveground facilities would therefore be permanent, but not significant.

Shallow Bedrock

The introduction of stones or rocks to surface soil layers may reduce soil moisture-holding capacity, resulting in a reduction of soil productivity. To minimize the introduction of stones or rocks to surface soil layers, our Plan requires that the size, density, and distribution of rock on the construction work area in agricultural lands be similar to adjacent areas undisturbed by construction and requires that excess rock be removed from at least the top 12 inches of soil in agricultural areas or in compliance with landowner agreements. Through adherence to these measures, no significant increase to the rock content of the topsoil is anticipated. Blue Mountain does not anticipate the need for blasting during trench excavation and would use a rock saw if consolidated rock were encountered. Potential impacts from shallow bedrock and the introduction of rock into surface soils would be mitigated and negligible.

Soil Rutting and Compaction

Compaction and rutting would be minimized by utilizing equipment bridges, mats, and pads as necessary during construction. Compaction would further be minimized through implementation of the construction and restoration measures outlined in our Plan and Procedures including topsoil segregation and de-compaction in agricultural areas and unsaturated wetlands. Therefore, we conclude impacts from soil rutting and compaction would be temporary and not significant.

Soil Erosion and Revegetation Potential

Soil erosion is the wearing away of physical soil properties by wind and water, and could result in a loss of soil structure, organic matter, and nutrients, all of which, when present, contribute to healthy plant growth and ecosystem stability. Clearing, grading, and equipment movement can accelerate the erosion process and, without adequate protection, result in discharge of sediment to waterbodies and wetlands.

Water erosion is quantified by the NRCS using the erosion factor K, which range from 0.02 to 0.69, with the lower values representing lower erodibility and higher values representing higher erodibility. K factors are determined by percentage of sand, silt, and

clay as well as hydrologic factors that influence an area. K factors for Project soils range from 0.20 to 0.49 ("High").

Wind erodibility groups (WEGs) are a set of classes given to soils based on compositional properties of the surface horizon such as texture, organic matter, content, and aggregate stability that are considered particularly susceptible to wind erosion. WEGs group 1 or 2, out of 8 total groups denote the most severe erosion potential from wind. The Project area has soils with WEGs from 3 to 6, indicating low to moderate susceptibility to wind erosion.

To minimize or avoid potential impacts due to soil erosion, Blue Mountain would implement controls in accordance with our Plan and Procedures. Temporary erosion controls, including interceptor diversions and sediment filter devices, such as silt fences, would be installed immediately following land disturbing activities. Blue Mountain would inspect these devices on a regular basis and after each rainfall event of 0.5 inch or greater to ensure proper function. Blue Mountain would additionally utilize dust-control measures, including routine wetting of the construction workspace as necessary where soils are exposed. Temporary erosion control devices would be maintained until the Project area is successfully revegetated.

Approximately 11 acres of soil with poor revegetation potential would be disturbed. Other Project area soils have moderate to high revegetation potential. Disturbed areas would be reseeded following construction in upland areas in accordance with our Plan, the seed mixtures and application rates for revegetation established in the NRCS's 2014 Oklahoma Field Office Technical Note, or landowner requirements.

Given Blue Mountain's proposed mitigation measures and that it would return disturbed areas to pre-construction conditions, maintain the right-of-way in an herbaceous state, or stabilize the aboveground facilities with gravel cover, permanent impacts due to soil erosion or poor revegetation potential are not anticipated.

Inadvertent Spills or Discovery of Contaminants

A review of the USEPA NEPAssist online database for hazardous waste, water discharges, toxic releases, superfund and brownfield sites, as well as the ODEQ's Data Viewer did not identify recent or historic areas of contamination within 0.5 mile of the Project facilities (USEPA, 2017a; ODEQ, 2017). Furthermore, no oil and gas exploration and extraction was identified within 200 feet of the proposed Project area. Based on the Project scope of work and the distance from potentially contaminated sites, we conclude the potential to encounter contaminated soils during construction of the Project is low. In the event that contaminated soils or other environmental media are identified during construction, Blue Mountain would implement its SPCC Plan to ensure further contamination does not occur.

During construction, contamination from accidental spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely impact soils. To minimize impacts, Blue Mountain would implement measures contained in its SPCC Plan which specifies cleanup procedures in the event of inadvertent spills during Project construction. We have reviewed this plan and find it to be acceptable.

Based on these measures, we conclude that the Project's impacts on soils would be minor and not significant.

B.3 WATER RESOURCES AND WETLANDS

B.3.1 Groundwater Resources

The Project area is underlain by the El Reno Groundwater Basin (USGS, 2003). The El Reno Groundwater Basin consists of Permian age shale, siltstone, and sandstones interbedded with gypsum and dolomite. The average depth to water in the basin is approximately 40 feet below the surface, and the average saturated thickness is estimated to be 210 feet (Belden, 2000). In 2010, freshwater groundwater withdrawals for Grady County averaged approximately 4.83 million gallons per day (USGS, 2010).

The most productive areas of the basin underlie three counties, including Grady County, which is considered a high yield area. Groundwater quality in the El Reno Groundwater Basin is generally better in the southern half where the Project is proposed. The southern portion of the basin tends to have lower concentrations of total dissolved solids and sulfate, corresponding to the rock units that are present, which contain lower amounts of bedded gypsum and salt deposits.

Sole Source Aquifers and Wellhead Protection Areas

The USEPA oversees the Sole Source Aquifer Protection Program to protect high production aquifers that supply 50 percent or more of the region's water supply. The Project area does not overlie any USEPA designated sole-source aquifer (USEPA, 2016a). Wellhead protection areas are defined as designated surface and subsurface zones surrounding public water supply wells or wellfields. A review of public data obtained from the ODEQ showed that Project facilities would not overlie current wellhead protection areas (ODEQ, 2017).

Public and Private Water Supply Wells

Well records data from the Oklahoma Water Resources Board, as well as field surveys and discussions with affected landowners, did not identify potable water wells within at least 150 feet of the Project area. The nearest identified water well is 0.3 mile from the Project area; therefore, we conclude impacts on groundwater supplies would not occur as a result of Project construction or operation.

Groundwater Contamination

There are no known sources of groundwater contamination in the immediate vicinity of the Project work areas. An accidental spill of fuel or hazardous material during refueling or maintenance of construction equipment could affect groundwater if not cleaned up appropriately. Soils impacted from spills could continue to leach contaminants to groundwater long after the spill has occurred. To minimize the risk of potential fuel or hazardous material spills, Blue Mountain would implement measures within its SPCC Plan.

Groundwater Impacts and Mitigation

Surface drainage and groundwater recharge patterns can be temporarily altered by clearing, grading, trenching, and soil stockpiling activities, potentially causing minor fluctuations in groundwater levels and/or increased turbidity, particularly in shallow surficial aquifers. We expect the resulting changes in water levels and/or turbidity in these aquifers to be localized and temporary because water levels quickly re-establish equilibrium and turbidity levels rapidly subside. Due to the average depth to groundwater in the El Reno Groundwater Basin of about 40 feet below the surface, Project trench dewatering would not impact this aquifer.

Furthermore, Blue Mountain would limit the amount of time trenches and bore pits remain open to allow local water tables to return to original elevations as quickly as possible. Upon completion of construction, Blue Mountain would restore the ground surface to original contours, to the extent practicable, and would re-vegetate disturbed areas, excluding areas within permanent aboveground facility fence lines and access roads, with the goal of restoring preconstruction overland flow and recharge patterns. We conclude no significant or long-term impacts from construction of the facilities would occur on groundwater resources with implementation of proposed mitigation measures and our Plan and Procedures. The addition of impervious surfaces at aboveground facilities may affect overland flow patterns and subsurface hydrology. However, these effects would be highly localized and minor and would not impact the underlying El Reno Groundwater Basin bedrock aquifer.

We conclude that the groundwater mitigation measures proposed by Blue Mountain would adequately avoid or minimize potential impacts on groundwater resources, and that long-term operational impacts on groundwater are negligible. Therefore, we do not anticipate any significant impacts on groundwater resources as a result of construction or operation of the Project.

B.3.2 Surface Water Resources

All Project facilities and workspaces would be within the Upper Washita Watershed (HUC 11130302) (USEPA, 2017b). Twelve waterbodies would be crossed or

otherwise impacted by the Project. Blue Mountain would cross six of these by the HDD method, five using the open-cut method, and one waterbody would not be crossed by the pipeline, but would be within the consruction workspace. Table B.3.2-1 indicates the milepost, waterbody name, state water quality and fisheries classification, flow regime, waterbody width, pipeline crossing length, and proposed method of crossing. The HDD and open-cut crossing method are described in section A.8.2.1.

No public surface water intakes occur within 3 miles of the Project area (ODEQ, 2017). The Project would also not impact any National Wild or Scenic Rivers (National Wild and Scenic Rivers System, 2017). Additionally, no surface waterbodies listed on the National Rivers Inventory or for Oklahoma limitations for additional protection would be impacted by the Project (NPS, 2017a; Oklahoma Water Resources Board [OWRB], 2017). The Project would not cross any waterbodies that are 303(d) listed impaired waters (ODEQ, 2017).

Blue Mountain would perform hydrostatic testing of the new pipeline prior to placing the facilities into service using a total of 393,435 gallons of water obtained from municipal sources. When complete, the water would be hauled off site in tanks to approved disposal facilities. Therefore, hydrostatic testing would not impact surface water resources.

Approximately 70,623 gallons of water would be used in HDD operations. This water would be obtained from nearby lakes and ponds in accordance with the requirements of Blue Mountain's Provisional Temporary Water Use Permit. Blue Mountain would obtain this permit prior to any surface water withdrawals. Upon completion of HDDs, the drilling mud would be hauled off-site and disposed of at an approved disposal facility in accordance with all applicable federal and state regulations.

The aboveground facilities are not proposed within a floodplain (Federal Emergency Management Agency, 2017), and as such, would not impact the flood storage capacity of any floodplains.

As shown in table B.3.2-1, six minor (e.g. less than 10 feet wide) streams would be crossed via HDD methods. The remaining waterbodies are one manmade pond, and five minor streams that are either intermittent or ephemeral streams.

Potential construction impacts on surface water resources from open cut crossings include modification of aquatic habitat, increased sedimentation and turbidity, decreased dissolved oxygen concentrations, inadvertent release of chemical and nutrient pollutants from sediments, and introduction of chemical contaminants such as fuel or lubricants. Whenever possible, Blue Mountain would perform crossings during low-flow periods to minimize impacts. The intermittent and ephemeral streams identified in table B.3.2-1 may not be flowing at the time of construction, further reducing potential for turbidity and sedimentation.

TABLE B.3.2-1
Waterbodies Crossed or Otherwise Impacted by the Project

Feature ID	Waterbody Name	Milepost	FERC Classification	Flow Regime	State Water Quality Classification [a]	Fisheries Classification	Approximate Waterbody Width (feet)	Pipeline Crossing Length (feet)	Proposed Crossing Method
Line 127									
SP2GR001	Unnamed Tributary of Salt Creek	0.30	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	4	5	Open cut
SP2GR002	Unnamed Tributary of Salt Creek	0.36	Minor	Intermittent	Ag, Aes, WWAC, PBCR	Warmwater	2	2	Open-cut
SP2GR003	Unnamed Tributary of Salt Creek	1.37	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	3	3	HDD
SP3GR001	Unnamed Tributary of Salt Creek	2.09	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	2	2	Open-cut
SP3GR002	Unnamed Tributary of Salt Creek	2.46	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	4	5	Open-cut
OWP3GR001	Unnamed Tributary of Salt Creek	2.59	N/A	Manmade Pond	Ag, Aes, WWAC, PBCR	Warmwater	30	47	Open-cut
Line 128									
SP1GR003	Unnamed Tributary of Salt Creek	0.54	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	3	3	HDD
SP1GR004	Unnamed Tributary of Salt Creek	0.55	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	3	3	HDD
SP3GR007	Unnamed Tributary of Salt Creek	1.30	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	4	7	HDD
SP3GR006	Unnamed Tributary of Salt Creek	1.50	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	2	0 [b]	Workspace Only
SP2GR006	Unnamed Tributary of Salt Creek	5.09	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	2	2	HDD

TABLE B.3.2-1
Waterbodies Crossed or Otherwise Impacted by the Project

Feature ID	Waterbody Name	Milepost	FERC Classification	Flow Regime	State Water Quality Classification [a]	Fisheries Classification	Approximate Waterbody Width (feet)	Pipeline Crossing Length (feet)	Proposed Crossing Method
SP2GR007	Unnamed Tributary of Salt Creek	5.10	Minor	Ephemeral	Ag, Aes, WWAC, PBCR	Warmwater	2	2	HDD

N/A = Not Applicable
[a] State Water Quality Classifications (OWRB, 2016)
Ag: Agriculture
Aes: Aesthetics
WWAC: Warm Water Aquatic Community
PBCR: Primary Body Contact
[b] Waterbody will not be crossed by the pipeline centerline, but is within the proposed Project footprint.

Blue Mountain would follow the measures contained in the FERC Procedures to minimize impacts of sedimentation and introduction of chemicals. This includes that all equipment would be parked overnight a minimum of 100 feet from waterbodies, hazardous materials would not be stored less than 100 feet from waterbodies, and concrete coating activities would not be performed with 100 feet of waterbodies. Equipment operating in the waterbody would be limited to that needed to construct the crossing. In addition, instream activities associated with crossing of minor waterbodies must be complete within 24 hours, and banks restored and temporary sediment barriers installed within 24 hours of completing instream construction activities.

The drilling mud used during the HDD process is under pressure; therefore, the potential exists for the mud to be released by migrating to the surface through a fracture in the underlying rock or substrate. Drilling mud consists of non-toxic bentonite clay and water, which can result in increased turbidity and sedimentation if it reaches a waterbody.

In the event of an IR during the HDDs, Blue Mountain would implement measures contained in its HDD Plan.

Blue Mountain would install temporary equipment bridges for access along the construction corridor to reduce turbidity and sedimentation impacts resulting from construction equipment and vehicular traffic crossing waterbodies. Timber mats may be used as equipment bridges, which would be designed to accommodate normal to high stream flow and would be maintained to prevent restriction of water flow during construction.

Should open trenches accumulate water from precipitation or groundwater, Blue Mountain would pump water to nearby vegetated upland areas using discharge dissipation devices, such as hay/straw bales and/or filter bags, in accordance with all permits. All water withdrawals would be performed in accordance with our Procedures and the requirements of Blue Mountain's Provisional Temporary Water Use Permit, which would be obtained from the OWRB prior to the initiation of surface water withdrawals.

Waterbodies would be restored to pre-construction contours to the extent practicable immediately following the crossings. When construction is complete, Blue Mountain would restore vegetated areas temporarily disturbed by construction to pre-construction conditions and would install temporary or permanent BMPs to protect nearby waterbodies from sedimentation. In order to minimize impacts on aquatic resources, Blue Mountain would also implement the measures outlined in the Procedures.

Blue Mountain would also implement the measures contained in its SPCC Plan to prevent and minimize the impacts from any spills of toxic materials used during construction (fuels, lubricants, solvents, etc.). These chemicals would be stored no less than 100 feet from surface waterbodies or wetlands per the Procedures.

With implementation of the Plan, Procedures, SPCC Plan, and HDD Plan, we conclude Project impacts on surface water resources would be sufficiently minimized and not significant.

B.3.3 Wetland Resources

Blue Mountain conducted a wetland delineation of the Project areas in accordance with the Regional Supplement to the USACE Wetland Delineation Manual: Great Plains Region (Version 2.0) (USACE, 2010) and the routine determination guidelines provided in the USACE Wetland Delineation Manual (Technical Report Y-87-1) (USACE, 1987). Two wetlands occur in the Project workspace: a palustrine emergent (PEM) wetland on Line 127 at MP 0.35; and a palustrine forested (PFO) wetland at MP 0.52 of Line 128. Vegetation associated with the PEM wetland consists of sand spikerush and broadleaf arrowhead. Vegetation associated with the PFO wetland consists of black willow, American elm, great ragweed, and bermudagrass.

A total of 0.03 acre of PEM wetlands would be impacted during construction. Upon construction completion, Blue Mountain would return the wetland to pre-construction conditions and it would be allowed to revegetate naturally. Given the PFO wetland would be crossed using the HDD method and no clearing would occur between the two drilling workspaces, impacts on this wetland would be avoided. However, the potential for an IR exists, and potential impacts on wetlands could occur, but would be minimized by implementation of Blue Mountain's HDD Plan, which includes procedures for monitoring, detection, isolating, stopping, and clean-up of inadvertent releases, as well as making necessary agency notifications.

The wetlands within Project workspaces are regulated by the USACE under section 404 of the Clean Water Act. Blue Mountain would follow all applicable federal, state, and local wetland permit requirements during construction.

Blue Mountain would also follow our Procedures, which includes limiting the amount of equipment in and adjacent to wetlands, restoring wetland contours, and conducting follow-up monitoring to ensure each wetland becomes re-established successfully. To minimize the potential for sedimentation of wetlands from Project construction activities, BMPs would be installed prior to initial ground disturbance along wetland boundaries. Blue Mountain would maintain the BMPs until the adjacent upland areas are successfully revegetated, at which time the temporary BMPs would be removed, as specified in our Procedures.

Compaction of wetland soils and rutting within wetlands caused by equipment operation can affect wetland hydrology and revegetation, and would be minimized by limiting equipment operation in wetlands and installing temporary equipment mats, as necessary. Blue Mountain would segregate topsoil, per our Procedures, if the wetland is not saturated.

In addition, Blue Mountain's SPCC Plan provides restrictions and mitigation measures to limit potential impacts associated with the release of fuels, lubricants, or other potentially toxic materials used during routine construction. Refueling and storage of hazardous materials would be prohibited within 100 feet of wetlands during construction, unless otherwise reviewed and approved by the EI. After the completion of construction, wetland areas crossed by travel lanes would be allowed to revegetate naturally. PEM wetlands would likely revert to pre-existing conditions within a few years following construction, resulting in no permanent impacts on these wetland types. In accordance with our Procedures, wetlands would be monitored annually for a minimum of three years and until revegetation is successful. If after the end of three years wetland revegetation is not successful, Blue Mountain would develop a wetland restoration plan in consultation with a professional wetland ecologist. With the implementation of the HDD crossing method, Procedures, SPCC Plan, and HDD Plan, we conclude impacts on wetlands would be minimized to the extent practicable and would not be significant.

B.4 FISHERIES, VEGETATION, AND WILDLIFE

B.4.1 Fisheries

Constructing the Project would require 12 waterbody crossing, of these, 6 would be crossed via HDD. The 6 that would be open cut or occur in workspace are either ephemeral, intermittent, or a manmade pond. All waterbodies crossed are warmwater fisheries (Ryswyk, 2017). Ephemeral streams do not support fish species, but intermittent streams could seasonally support small minnow species. No commercial fisheries would be impacted by the Project (Ryswyk, 2017; OKDWC, 2017), and no designated recreation areas for fishing such as wildlife management areas or state parks would be crossed by the Project.

None of the waterbodies that would be crossed by the Project are classified as stocked or natural trout fisheries (OKDWC, 2014). Furthermore, none of the waterbodies proposed to be crossed by the Project contain suitable habitat for federal or state listed threatened and endangered fish species or are designated as essential fish habitat (NMFS, 2017).

Blue Mountain anticipates crossing streams classified as warmwater fisheries prior to the June 1 through November 30 construction timing window stated in our Procedures. However, the Oklahoma Department of Wildlife Conservation (OKDWC) stated in an email dated December 20, 2017, that crossing of these streams prior to the construction timing window would not significantly affect the species that comprise the warmwater fisheries.

Impacts on waterbodies that would be crossed using the open-cut method would be temporary and localized and are not anticipated to significantly affect local fisheries.

Sedimentation and turbidity, alteration or removal of instream and stream bank cover, stream bank erosion, introduction of water pollutants, water depletions, and entrainment of small fishes during water withdrawals resulting from Project activities could increase stress, injury, and mortality of stream biota, including fisheries. However, Blue Mountain would implement general erosion control methods, with special emphasis on controlling erosion and sedimentation and maintaining riparian vegetation, as recommended in the OKDWC's correspondence. It would also implement measures contained in the FERC Plan and Procedures to control erosion and sedimentation and to minimize impacts on fisheries.

Blue Mountain would also implement the HDD method for installing the pipelines across six potentially aquatic life-supporting waterbodies, thereby avoiding direct impacts on the waterbodies and associated fisheries and other aquatic resources. However, during the HDD process, the drilling mud utilized is under pressure; therefore, the potential exists for the mud to be released by migrating to the surface through a fracture in the underlying rock or substrate. In the event of an IR, impacts on fish and other aquatic resources would be similar to those associated with increased sedimentation and turbidity as discussed above. Blue Mountain would minimize both the potential for, and impacts on fishery or aquatic resources in the event of an IR by following the procedures outlined in its HDD Plan.

Blue Mountain would also adhere to the Project-specific SPCC Plan and our Procedures, which specify preventive measures, such as personnel training, equipment inspection, and refueling procedures, as well as measures for containment and cleanup of a spill if it occurs.

Based on Blue Mountain's use of the HDD method to cross six streams and its implementation of the HDD Plan, SPCC Plan, and our Plan and Procedures, we conclude that fisheries would not be significantly affected by the Project.

B.4.2 Vegetation

The Great Plains Steppe and Shrub Province, where the Project is proposed, is comprised of irregular, dissected plains located mostly within southwestern Oklahoma (USDA, 2017b). Vegetation communities within this region include prairies, savannas, and woodlands (USDA, 1996). Two vegetation cover types would be affected by the Project facilities, including open areas (unimproved fields, actively cultivated row crops, and existing utility easements) and wetlands (PEM wetlands). Dominant herbaceous vegetation species associated with the open land include bermudagrass, annual bluegrass, yellow bluestem, silver bluestem, little bluestem, hedge false bindweed, and white tridens. Wetlands are discussed further in section B.3.3. No forested vegetation would be impacted. Table B.5.1-1 indicates the summary of land use impacts that would occur during Project construction and operation.

The majority of the impacts of Project clearing on vegetation would be minor and short-term. Blue Mountain would reseed disturbed areas following construction in upland areas in accordance with our Plan, the seed mixes and application rates for revegetation established in the NRCS's Oklahoma Field Office Technical Note (NRCS, 2014), or landowner requirements.

In the event of a spill or release of hazardous materials during construction, Blue Mountain would prevent adverse impacts on vegetation by implementing its SPCC Plan and adhering to our Plan and Procedures.

Blue Mountain would implement several management strategies to minimize the spread of exotic and invasive plant species following construction. Management and control measures proposed include:

- following our Plan to ensure that soil movement and the associated movement of non-native seeds are minimized;
- using techniques that minimize the time that bare soil is exposed, thus minimizing the opportunity for exotic species to become established; and
- monitoring the disturbed sites following construction to ensure that revegetation with suitable cover plant mixtures has been successful and that invasive or exotic species have not become established.

Because Blue Mountain would implement the above-noted minimization measures, our Plan and Procedures, and its SPCC Plan during Project implementation, impacts on vegetation would be sufficiently minimized and not significant.

B.4.3 Wildlife

The Project would impact open land and wetlands that support wildlife. In addition, industrial areas and a pond (classified as open water) may support limited wildlife. Blue Mountain anticipates that construction would begin in early 2018 and last approximately 3 months. The Project would not impact any areas classified as sensitive wildlife habitat, such as National Wildlife Refuges, state wildlife management areas, or privately owned management areas or preserves. Additionally, the Project would not impact any high-quality cover or forage areas.

Open land provides habitat to species such as coyote, cottontail rabbit, deer mouse, mourning dove, purple martin, red-tailed hawk, American kestrel, field sparrow, and ornate box turtle. Industrial habitat is not high quality for wildlife but some species could occur there include raccoon, northern mockingbird, and house finch. Wetlands provide foraging, breeding, and nesting habitat to a variety of species including raccoons, squirrels, red-winged blackbird, wood duck, red eared slider, and cottonmouth. Open

water provides habitat for the red-eared slider, common snapping turtle, and gray tree frog.

Clearing and grading for construction could result in direct mortality of some small, less mobile mammals, reptiles, and amphibians that are unable to leave the construction area. Wildlife in the area could also be adversely affected by construction noise; however, noise levels along the pipeline will return to pre-construction levels immediately following completion of construction activities.

Although Blue Mountain does not currently propose to conduct drilling activities at night, drilling activities may be required at night to avoid the risk of a drill failing. Under this scenario, Blue Mountain would install artificial lighting to illuminate the drill entry and exit locations for safety purposes. Blue Mountain would use a minimum of two sets of hooded lights at each of these locations, each set containing two lights. Using hooded lights and only placing them where necessary to complete the HDD would limit the extent of potential impacts on wildlife as a result of artificial lighting. Once the drill is complete, Blue Mountain would remove the artificial lighting to avoid additional impacts on wildlife.

Wildlife could become trapped in open trenches. To minimize this risk and any injuries caused by open trenches, Blue Mountain would install temporary fences around the trenches and/or establish alternative locations for livestock/wildlife to cross the construction corridor. In addition, the EI would inspect all trenches daily prior to construction for wildlife. Where necessary and practicable, Blue Mountain would also install ramps in the trench at regular intervals to provide an exit for wildlife that may fall into the trench and would provide gaps in spoil piles to allow wildlife to exit the construction corridor.

Only temporary and minor impacts on wildlife species in the Project area would be expected, and no impacts on wildlife at a community or regional level would be caused by Project construction or operation. Wildlife habitats that would be affected by construction are relatively abundant in the areas adjacent to the right-of-way, and wildlife displaced during construction can temporarily relocate to suitable habitat nearby. Disruption of wildlife movement is expected to be minor because no permanent barriers, with the exception of the fenced/graveled aboveground facilities, to wildlife would be constructed.

In an effort to further minimize or avoid impacts on wildlife, Blue Mountain would provide environmental training to all contractors and workers outlining the appropriate steps to take should wildlife be encountered during construction or identified in trenches prior to commencement of construction activities each day.

With implementation of these measures, we conclude impacts on wildlife would be short-term, sufficiently minimized, and not significant.

B.4.3.1 Migratory Birds

Migratory birds are protected under the Migratory Bird Treaty Act (16 United States Code sections 703-711), which prohibits the taking of any migratory bird, or a part, nest, or eggs of any such bird. Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 United States Code sections 668-668d). Executive Order No. 13186 (66 Federal Register 3853), directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and to avoid or minimize adverse effects on migratory birds through enhanced collaboration with the U.S. Fish and Wildlife Service (FWS). Executive Order No. 13186 states that emphasis should be placed on species of concern, priority habitats, and key risk factors and that particular focus should be given to addressing population-level impacts. On March 30, 2011, the FWS and the Commission entered into a Memorandum of Understanding that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. The Project is within North American Bird Conservation Initiative Bird Conservation Region 19 – Central Mixed-Grass Prairie. Appendix C provides a listing of Birds of Conservation Concern that could occur in the Project area, seasons they are present, preferred habitat, and likelihood that they would be impacted by the Project (FWS, 2008).

The migratory bird nesting season in Oklahoma is generally considered April 1 to August 15. Pipeline construction during this timeframe could result in short-term disturbance of migratory bird habitat, causing birds present in the Project area to relocate temporarily. The Project has the potential to alter or otherwise affect migratory bird foraging habitat temporarily; however, such impacts would be minimal, given the prevalence of similar habitats available outside of the construction right-of-way. No forested habitat would be removed during Project implementation. In addition, Blue Mountain would adhere to the maintenance time-of-year restrictions in our Plan, thus limiting impacts on migratory birds during operation of the Project.

Although Blue Mountain intends to construct outside the nesting bird season, the possibility exists of construction schedule changes. Therefore, if Blue Mountain clears vegetation during the period of April 1 and August 15, it would perform the following minimization measures:

- conduct a pedestrian nest survey of the construction right-of-way a maximum of one week prior to the start of clearing activities;

- if a nest is identified during the survey, the qualified biologists would document its location utilizing a hand-held GPS unit. The biologists would also document the habitat type where the nest is located, the condition of the nest, the status (active or inactive), the presence and number of eggs/young, and the presence and species of adult birds in or near the nest;

- if an unoccupied nest (i.e., a nest without birds or eggs) is identified during the survey, it will be handled in accordance with the Migratory Bird Permit Memorandum issued by the FWS on April 15, 2003 (https://www.fws.gov/policy/m0208.pdf); and

- if an occupied nest (i.e., a nest with birds or eggs) is identified during the survey, the biologists would mark the nest location with flagging to prevent construction activities from occurring within 20 feet of the nest. If the nest is within critical workspace needed to successfully complete construction of the project, Blue Mountain would coordinate with the FWS to develop site-specific mitigation measures to minimize construction delays.

The FWS addressed migratory birds in its letter response to Blue Mountain dated November 2, 2017, including pointing out two Birds of Conservation Concern that could occur in the Project area - Harris's sparrow and the red-headed woodpecker. The correspondence from the FWS also provided links to websites that provide recommended measures to minimize impacts on migratory birds.[4] Blue Mountain has addressed these recommendations sufficiently. Given Blue Mountain would not remove any forested habitat, would follow our Plan, would either construct outside of the nesting season or complete nesting surveys and avoid constructing in areas of active nests, we find the impacts on migratory birds as a result of Project implementation would be sufficiently minimized and not significant.

B.4.4 Threatened, Endangered, and Special Status Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the *Endangered Species Act of 1973* (ESA), as amended, and those species that are state-listed as endangered or threatened. Section 7 of the ESA requires that the lead federal agency ensures that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. FERC, as the lead federal agency for NEPA review of the Project, is required to consult with the FWS to determine whether any federally listed endangered or threatened species or any of their designated critical habitat are near the Project and to determine the proposed action's potential effects on those species or critical habitats. If FERC determines that the Project would have no effect on a listed species, further consultation with the FWS is not required.

[4] See http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php for FWS guidance on migratory birds.

Blue Mountain, acting as our non-federal representative for the purpose of complying with Section 7(a)(2) of the ESA, completed informal consultation with the FWS, the Oklahoma Natural Heritage Inventory, and the OKDWC regarding federal and state-listed species with the potential to be affected by the Project. The Oklahoma Natural Heritage Inventory and the OKDWC confirmed in correspondence dated September 17, 2017 and September 12, 2017, respectively that no state-sensitive or listed aquatic or terrestrial species of concern were identified in the Project area. Table B.4.4-1 below lists the federally listed threatened and endangered species and special concern species that have the potential to occur within the Project area, including their status, habitat requirements, impact assessment, and determination of effect.

The Project is proposed along the migration route for the federally endangered whooping crane. The Project area is outside of this species' breeding and wintering range; however, whooping cranes pass through the western half of Oklahoma during their spring (late March through early May) and fall (mid-September through mid-December) migrations (ODWC, 2011 and USFWS 2017b). Preferred migration habitat consists of croplands and shallow, freshwater wetlands (Cornell Lab of Ornithology, 2015). Potential suitable migration stopover habitat is present within the Project area as a significant portion of the Project route crosses actively cultivated cropland. However, migrating individuals would likely avoid the construction area or if already present, would move out of construction areas and relocate to similar adjacent habitats until construction is complete. Furthermore, a majority of the construction activities associated with the Project are anticipated to occur outside of the primary migration period for the species. No impacts on this species are anticipated during operation of the Project. Therefore, the Project *is not likely to adversely affect* the whooping crane.

No other federally listed species potentially occurring within Grady County have suitable habitat within the Project area. Therefore, the Project would have *no effect* on these species.

Blue Mountain submitted a Project Review Package requesting concurrence with the determination that the Project will have *no effect* or is *not likely to adversely affect* federally listed threatened and endangered species to the FWS Oklahoma Ecological Field Office on November 2, 2017. The FWS Project Review package instructions on the Oklahoma Division of Ecological Services website (https://www.fws.gov/southwest/es/Oklahoma/OKESFO%20Permit%20Home.htm) state that if the FWS has not responded within 45 days of the date the Project Review Package was submitted, Section 7 consultation is considered complete. Given 45 days has passed, the FWS has concurred with the determination and no further consultation is necessary.

TABLE B.4.4-1
Federally Threatened and Endangered Species Potentially Occurring within the Project Area

Common Name	Scientific Name	Federal Status	Preferred Habitat	Project Impact Assessment	Determination of Effect
Least Tern	*Sterna antillarum*	E	Nests (April – June) in bare or sparsely vegetated sand, shell, and gravel beaches, sandbars, islands, and salt flats associated with rivers and reservoirs. Winters on the coasts of Central and South America.	Suitable breeding habitat is not present in Project area. The species is highly mobile and will likely avoid the construction site during migration.	*No effect*
Piping Plover	*Charadrius melodus*	T	Breeds in sandy upper beaches, sparsely vegetated shores and islands, and alkali wetlands. During their biannual migration, individuals or small groups found on coastal beaches, sandflats, mudflats, and tidal flats.	Suitable breeding habitat is not present in Project area. The species is highly mobile and will likely avoid the construction site during migration.	*No effect*
Rufa Red Knot	*Calidris canutus rufa*	T	Breeds in drier tundra areas of the central Canadian Arctic and winter in Tierra del Fuego and Patagonian Argentina. During migration, occurs in coastal mudflats, tidal and intertidal zones, and marine habitats, especially near coastal inlets estuaries, and bays.	Suitable breeding habitat is not present in Project area. The species is highly mobile and will likely avoid the construction site during migration.	*No effect*
Whooping Crane	*Grus americana*	E	Nests in shallow, grassy wetlands interspersed with grasslands or scattered evergreens. Winters in coastal marsh and estuaries. During migration, found on wide, shallow river flats and croplands.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats	*Not likely to adversely affect*

E = Endangered; T = Threatened; NL = Not Listed
Sources: FWS, 2017a; National Audubon Society, 2017; Cornell Lab of Ornithology, 2011; Bird Life International, 2017.

B.5 LAND USE, RECREATION, AND VISUAL RESOURCES

B.5.1 Land Use

Land use categories identified in the Project area consist of agriculture, open land, industrial, and wetlands. The Project will impact a total of 80.8 acres of land, including 3.3 acres of permanent impacts associated with the metering and pigging facility and 34.7 acres of permanent impacts associated with the pipeline right-of-way. Table B.5.1-1 summarizes the land use impacts associated with the construction and operation of the Project.

Impacts and mitigation on open water and wetlands are described in sections B.3.2 (open water) and B.3.3 (wetlands) of this EA. The sections below focuses on agricultural and industrial land uses that are not discussed in detail elsewhere in this EA.

B.5.1.1 Agricultural Land

The majority of the Project area is characterized by agricultural land, consisting of improved pasture and actively cultivated row crops. The primary crops in the Project area, as identified during field surveys, are grain sorghum and hay. Agricultural land accounts for approximately 83 percent of the total Project area. Blue Mountain would use a total of 66.7 acres of agricultural land for construction and 29.6 acres during operation of the Project. An additional 3.1 acres of agricultural land would be permanently impacted by the installation of the metering and pigging facility. With the exception of the metering and pigging facility, Blue Mountain would restore all agricultural land impacted by the Project to its original use.

Blue Mountain would minimize adverse impacts on agricultural land by implementing our Plan, which includes replacement of topsoil, stone removal, and compliance with reseeding specifications. Blue Mountain would protect active pasture land during construction through the installation of temporary fencing, the use of alternative locations for livestock to cross the construction corridor, and/or alternate feeding arrangements, as negotiated with the landowner.

In order to ensure that productivity of agricultural land impacted by the Project is maintained following construction, Blue Mountain would restore contours to pre-construction conditions, including the terraces. Should construction result in any new drainage or ponding issues, Blue Mountain would work with the landowner to resolve the problem.

TABLE B.5.1-1
Summary of Land Use Impacts (acres)

Facility	Agriculture		Open Land		Wetland		Industrial		Project Total	
	Const. [a]	Op. [b]	Const. [a]	Op. [b]	Const. [a]	Op. [b, c]	Const. [a]	Op. [b, c]	Const. [a]	Op. [b]
Pipeline Facilities										
Line 127										
Pipelines	29.2	14.8	1.7	0.9	0.0	0.0	0.2	0.1	31.0	15.8
ATWS	0.7	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.1	0.0
Access Roads	1.4	0.0	0.1	0.0	0.0	0.0	0.7	0.0	2.2	0.0
Line 128										
Pipelines	29.4	14.9	7.3	3.8	0.1	0.1	0.1	0.1	36.9	18.9
ATWS	1.7	0.0	0.7	0.0	0.0	0.0	0.0	0.0	2.5	0.00
Access Roads	1.2	0.0	2.6	0.0	0.0	0.0	0.0	0.0	3.8	0.00
Pipeline Facilities Subtotal	*63.6*	*29.6*	*12.7*	*4.7*	*0.2*	*0.2*	*1.0*	*0.2*	*77.5*	*34.7*
Aboveground Facilities										
Metering and Pigging Facility	3.1	3.1	0.1	0.1	0.0	0.0	0.0	0.0	3.2	3.2
Aboveground Facilities Subtotal	*3.1*	*3.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*3.2*	*3.2*
PROJECT TOTAL	**66.7**	**32.7**	**12.8**	**4.8**	**0.2**	**0.2**	**1.0**	**0.2**	**80.7**	**37.9**

[a] Land affected during construction is inclusive of operation impacts (permanent).
[b] Land affected during operation consists only of new permanent impacts.
[c] Operational land use impacts associated with wetlands have been calculated based on the proposed 30-foot–wide permanent easement. Per our Procedures, Blue Mountain would maintain a 10-foot-wide cleared easement in wetlands and no tree clearing would occur between HDD entry and exit locations. For more information on wetland impacts associated with the Project see Section 2.0.

B.5.2 Industrial Land

Industrial land encompasses the developed land that would be crossed by the Project. The Project would avoid residential land. The nearest residence is approximately 370 feet from the proposed Project area (near MP 4.34 of Line 128). Industrial areas crossed by the proposed Project facilities consist entirely of roads. Most of these areas are either sparsely vegetated or lack vegetation due to the presence of impervious surfaces such as pavement, gravel, or bare, compacted land with a hard surface. Industrial land accounts for 1 percent of the Project area. A total of 1.0 acre of industrial land would be used during construction of the Project, of which 0.2 acre would be associated with the new permanent pipeline right-of-way and the metering and pigging facility.

B.5.3 Transportation and Utilities

Construction of the Project could result in short-term impacts from disruption of local utilities, increased construction-related traffic on local roads, as well as dust and noise generated during construction. Blue Mountain would minimize these impacts through implementation of the following mitigation measures:

- Blue Mountain would take all measures necessary to ensure that utilities are not disrupted during construction. If the need to disrupt utilities arises, Blue Mountain would provide as much notice as possible to the landowner prior to disruption.

- Traffic flow and emergency vehicle access would be maintained on residential roadways and traffic detail personnel and/or detour signs would be used where appropriate.

Line 127 crosses an existing wind farm near MP 1.9; however, no turbines are in proximity to the proposed Project workspace. Therefore, the Project is not anticipated to impact or be impacted by the wind farm.

B.5.4 Public Land, Recreation, and Other Designated Areas

Blue Mountain reviewed publicly available information, as well as consultated with federal and state agencies and landowners to identify any public land, recreational, and other designated areas within the vicinity of the Project area. The Project would not cross or be within 0.25 mile of any National Park System Units, which include national parks, monuments, preserves, historic sites, historical parks, memorials, battlefields, military parks, cemeteries, recreation areas, seashores, lakeshores, parkways, trails, and other designations (NPS, 2017b; 2010a). Additionally, the Project would not cross and or be within 0.25 mile of any National Wilderness Areas, registered National Landmarks, or FWS National Wildlife Refuges, (NPS, 2017d; FWS, 2017a). Further, the Project is not

proposed within 0.25 mile of any state parks, forests, or wildlife management areas (Travel OK, 2017; ODWC, 2017d).

The USDA Farm Service Agency manages the Conservation Reserve Program, which is a voluntary program for agricultural landowners to assist in the prevention of topsoil erosion and conservation of natural resources. The Wetland Reserve Program is another conservation program managed by the NRCS and is a voluntary program aimed at the protection, restoration, and enhancement of wetlands to achieve the greatest wetland functions and optimum wildlife habitat. Based on review of public documents and discussions with landowners, no Conservation Reserve Program or Wetland Reserve Program lands would be crossed by the Project.

The Oklahoma Commission of Land Office manages Section 16 and 36 School Lands in each township for the use and comment benefit of schools. Based on property data and conversations with landowner, no Section 16 and 36 School Lands are crossed by the Project.

B.5.5 Visual Resources

The Project would not be within any federal, state, or locally designated scenic areas, such as National Wild and Scenic Rivers and scenic roads/highways. Impacts on visual and/or aesthetic resources would primarily occur during construction as a result of the presence of construction equipment. The majority of impacts on visual resources would be temporary; however, the creation of the new permanent pipeline easement and the installation of the metering and pigging facility would create some minor permanent impacts on visual resources.

Impacts on visual resources as a result of the new permanent pipeline easement would be minimal, as the Project would not cross forested areas, where maintained easements are more prominent. The metering and pigging facility is about 0.33 mile from the nearest residence. Visual impacts on this residence are not anticipated due to the lack of tall or otherwise prominent structures at the metering and pigging facility. In addition, there is an existing natural visual screen consisting of trees between the metering and pigging facility and the residence, which would not be disturbed by the Project activities. Therefore, we conclude that visual impacts from construction and operation would be minimal.

B.6 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act, as amended, requires the FERC to take into account the effect of its undertakings on properties listed, or eligible for listing, on the National Register of Historic Places, and to afford the Advisory Council on Historic Preservation an opportunity to comment.

Blue Mountain completed a cultural resources survey for the Project and provided the resulting report to the FERC, the OAS, and the SHPO. The survey included a 200-foot-wide corridor for the pipelines, a 50-foot-wide corridor for access roads, as well as the metering and pigging facility and extra workspace. Approximately 250.2 acres were surveyed, including excavation of 289 shovel test units. No cultural resources were identified as a result of the survey. In a letter dated December 14, 2017, the SHPO found that there were no historic properties affected by the Project. In a letter dated December 7, 2017, the OAS concurred with the recommendations in the report. We concur with the SHPO and OAS and have determined that the Project would not affect cultural resources.

Blue Mountain contacted the following Native American tribes regarding the Project, providing a project description and mapping, and also conducted follow-up telephone calls and emails: Apache Tribe of Oklahoma; Chickasaw Nation; Comanche Nation; Fort Sill Apache; Kiowa Indian Tribe of Oklahoma; Osage Nation; and Wichita and Affiliated Tribes. The Comanche Nation responded and indicated that "no properties" were identified. The Osage Nation requested a project update and inquired about surveys. Blue Mountain provided the Osage Nation with a copy of the survey report. The Chickasaw Nation indicated it would wait for agency consultation. No other responses have been received. We sent our NOI to these same tribes. The Osage Nation responded and requested that a cultural resources survey be conducted. As discussed above, a survey was completed, and the survey report provided to the Osage Nation. No other responses have been received.

Blue Mountain provided a plan to address the unanticipated discovery of cultural resources and human remains during construction. We requested minor revisions to the plan. Blue Mountain provided a revised plan which we find acceptable.

B.7 AIR QUALITY AND NOISE

B.7.1 Air Quality

The term air quality refers to relative concentrations of pollutants in the ambient air. The subsections below describe air quality concepts that are applied to characterize air quality and to determine the significance of increases in air pollution.

Construction and operation of the Project would impact local and regional air quality; although the majority of air emissions would result from construction of the Project.

Ambient air quality is protected by the Clean Air Act (CAA) of 1970, as amended in 1977 and 1990. The USEPA oversees the implementation of the CAA and establishes National Ambient Air Quality Standards (NAAQS) to protect human health and welfare. NAAQS have been developed for seven "criteria air pollutants", including nitrogen dioxide, carbon monoxide (CO), ozone, sulfur dioxide, particulate matter less than or

equal to 2.5 microns in aerodynamic diameter, particulate matter less than or equal to 10 microns in aerodynamic diameter, and lead, and include levels for short-term (acute) and long-term (chronic) exposures. The NAAQS include two standards, primary and secondary. Primary standards establish limits that are considered to be protective of human health and welfare, including sensitive populations such as children, the elderly, and asthmatics. Secondary standards set limits to protect public welfare, including protection against reduced visibility and damage to crops, vegetation, animals, and buildings (USEPA 2016c). Additional pollutants, such as volatile organic compounds (VOC) and hazardous air pollutants (HAP), are emitted during fossil fuel combustion. These pollutants are regulated through various components of the CAA.

Greenhouse gases (GHG), the most common of which are carbon dioxide (CO_2), methane, nitrous oxide, ozone, hydrofluorocarbons, and perfluorocarbons, are naturally occurring pollutants in the atmosphere and products of human activities, including burning fossil fuels. Fossil fuel combustion emits CO_2, methane, and nitrous oxide. GHG emissions are generally calculated and regulated in terms of carbon dioxide equivalents (CO_{2e}). The CO_2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO_2. Thus, CO_2 has a GWP of 1, methane has a GWP of 25, and nitrous oxide has a GWP of 298.

B.7.1.1 Existing Air Quality

The USEPA, state, and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the U.S. The data are then averaged over a specific time period and used by regulatory agencies to determine compliance with the NAAQS and to determine if a particular area meets the NAAQS. Areas that meet the NAAQS are termed "attainment areas." Areas that do not meet the NAAQS are termed "nonattainment areas." Areas for which insufficient data are available to determine attainment status are termed "unclassifiable areas." Areas formerly designated as nonattainment areas that have subsequently reached attainment are termed "maintenance areas." Grady County is designated as attainment and unclassifiable for all criteria pollutants.

B.7.1.2 Permitting/Regulatory Requirements

The Project would result in minor fugitive leaks but would not result in operational emissions from emission-generating combustion units (such as compressor engines), and as such, the only applicable provision of the CAA is General Conformity. The lead federal agency (i.e., FERC) must conduct a conformity analysis if a federal action would result in the generation of emissions that would exceed the conformity threshold levels of the pollutant(s) for which a county is designated nonattainment or

maintenance. Estimated emissions for the Project are not subject to review under the general conformity thresholds because the Project is in an area classified as attainment/unclassifiable for all criteria pollutants.

B.7.1.3 Construction Emissions Impacts and Mitigation

Project construction would result in temporary, localized emissions that would last the duration of construction activities (i.e., about 3 months). Exhaust emissions would be generated by the use of equipment powered by diesel or gasoline engines, as well as delivery vehicles and construction workers commuting to and from work areas. Large earthmoving and other mobile equipment are sources of combustion-related emissions, including criteria pollutants, GHGs, VOCs, and small amounts of HAPs. In addition, fugitive dust would be generated by construction activities due to land clearing and grading, ground excavation, and driving on unpaved roads. The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic and types, and roadway characteristics. Dust would be greater during dry periods and in areas of fine-textured soils subject to surface activity.

Construction emissions were estimated based on the fuel type and anticipated frequency, duration, capacity, and levels of use of various types of construction equipment. Construction emissions were estimated using emission factors provided in USEPA's *Tier 3 Off-Road Standards*, USEPA's AP-42 *Compilation of Air Pollutant Emission Factors*, and 40 CFR 98 (for GHG estimates). Table B.7.1.3-1 provides a conservative estimate of emissions, including criteria pollutants, total HAPs, fugitive dust, and GHGs from all construction and HDD activities.

Table B.7.1.3-1
Emissions from Construction Equipment (tons per construction duration)

Pollutant	Criteria Pollutants						CO_2e [a]	Formaldehyde	Total HAPs
	NO_x	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$			
Total for Construction Duration	**50.4**	**24.4**	**4.4**	**0.04**	**5.9**	**3.5**	**4,558.4**	**0.03**	**0.11**

NO_x = Nitrogen Oxides
SO_2 = Sulfur dioxide
PM_{10} = Particulate matter (10 microns or less)
$PM_{2.5}$ = Particulate matter (2.5 microns or less)

Construction emissions shown in table B.7.1.3-1 would be temporary and localized and are not expected to significantly impact local or regional air quality. In order to minimize emissions, Blue Mountain would minimize construction emissions by using equipment and vehicles with federal design standards imposed at the time of manufacture, and would purchase commercial gasoline and diesel fuel products that are controlled by federal and state air pollution control regulations. In addition, Blue Mountain would take reasonable precautions to prevent fugitive dust from becoming airborne, including the following:

- use of water for control of dust during construction operations, road grading, or land clearing;
- maintenance of roadways;
- removing soil/debris transported by construction equipment from streets;
- proper maintenance of equipment;
- covering open-bodied haul trucks while transporting materials;
- minimizing soil disturbance; and
- use of off-site parking and shuttle buses to minimize traffic, if necessary.

Construction emissions would occur over the duration of construction activity and would be emitted at different times and locations throughout the Project area. Construction emissions would result in short-term, localized impacts in the immediate vicinity of the Project work areas. With the mitigation measures proposed by Blue Mountain, we conclude that construction-related emissions would be temporary and would not result in significant impacts on local or regional air quality.

B.7.1.4 Operational Emissions

Blue Mountain does not propose any new equipment or compressor units that would result in operational emissions. However, fugitive emissions from minor leaks would occur at valves, seals, and other piping components during normal operation and maintenance of the Project. Blue Mountain estimated that fugitive emissions and releases during operation the Project could result in approximately 60 metric tons per year (tpy) of CO_2e. Based on the minimal operational emissions, we conclude that the proposed Project would not result in impacts on local or regional air quality.

The Project would result in downstream GHG emissions. GHG emissions from construction and operations were included as CO_2e in table B.7.1.3-1. The Project's requested certificated capacity is designated for markets in Oklahoma and neighboring states. The downstream GHG emissions of the Project were estimated using a USEPA-approved methodology to be approximately 4.52 million metric tpy of GHG (as CO_2e). The downstream emissions estimate assumes maximum load operation of the Project facilities for the entire year and that all of the gas to be transported is eventually combusted. This is a conservative estimate, as projects are typically designed for peak use and rarely transport at maximum capacity 365 days per year.

In an effort to provide some context, the downstream emissions estimate was compared to the GHG inventory for the State of Oklahoma using GHG inventory data from the Energy Information Administration (EIA) (EIA, 2017). The EIA inventory

identified that fossil-fuel related sources emitted 101.4 million metric tons of GHGs in Oklahoma in 2015, the year with the most recently-available data. At the national level, the downstream emissions estimate was compared to the EPA's *Inventory of U.S. Greenhouse Gas Emissions and Sinks* (EPA, 2017c). The EPA inventory estimated that 5,414.4 million metric tons of GHG were emitted at the national level in 2015. Assuming, conservatively, that all of the gas is combusted in the State of Oklahoma, the downstream use of the Project-related natural gas could potentially increase GHG emissions from the 2015 levels by 4.5 percent within Oklahoma and by 0.08 percent at the national level. This estimate represents the upper bound for the amount of end-use combustion that could potentially result from the gas transported by this Project. No standard methodology exists to determine how a project's contribution to GHG emissions would translate into physical effects on the environment for the purposes of evaluating the Project's impacts on climate change. Without an accepted methodology, the Commission cannot make a finding whether a particular quantity of GHG emissions poses a significant impact on the environment, whether directly or cumulatively with other sources, and how that impact would contribute to climate change.

B.7.2 Noise

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Construction and operation of the Project would affect overall noise levels in the Project area. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, the L_{dn} is the L_{eq} plus a 10 decibel on the A-weighted scale (dBA) penalty added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 p.m. and 7:00 a.m.). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 5 dBA is clearly noticeable to the human ear; and 10 dBA is perceived as a doubling of noise (Bies and Hansen 1988).

In 1974, the USEPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (USEPA 1974). This document provides information for state and local governments to use in developing their own ambient noise standards. The USEPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We

have adopted this criterion and use it to evaluate the potential noise impacts from the Project at noise sensitive areas (NSAs). NSAs are defined as homes, schools, churches, or any location where people reside or gather. FERC requires that the noise attributable to any new compressor engine or modifications during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. Due to the 10 dBA penalty added for nighttime noise, for a facility to meet the 55 dBA L_{dn} limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA L_{eq} at any NSA. No other applicable state or local noise regulations exist.

B.7.2.1 Construction Noise

Noise would be generated during construction of the Project. Construction activities in any one area could last from several weeks to several months on an intermittent basis. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and local. Noise mitigation measures to be employed during construction include ensuring that sound muffling devices that are provided as standard equipment by the construction equipment manufacturer are kept in good working order. In addition, with the exception of HDD activities, Blue Mountain committed to limiting construction activities to daytime hours. No NSAs were identified within 0.5 mile of the proposed HDD crossing locations. Therefore, due to the large distance between NSAs and HDD locations, potential noise impacts associated with HDD activities, especially during nighttime hours, is anticipated to be minimal.

Based on the temporary nature of construction activities and the lack of NSAs near the HDDs, we conclude that construction activities would not result in significant noise impacts on nearby NSAs.

B.7.2.2 Operational Noise

The proposed meter station would generate noise on a continuous basis (i.e., up to 24 hours per day) when operating. The noise impact associated with the meter station would attenuate with distance from the meter station. In order to determine the noise impacts of operation of the Project, a noise analysis was conducted. The noise analysis used measurements of the existing noise levels based on a September 13, 2017 noise survey for determining the projected noise increases at the NSAs.

Table B.7.2.2-1 summarizes the estimated noise impacts at the nearest NSAs during operations. The results of the noise analysis indicate that the noise attributable to operation of the meter station would be below 55 dBA (L_{dn}) at both NSAs. Because the predicted change in sound levels at the NSAs are less than 3 dBA, the meter station would not result in a perceptible sound level increase during normal operation (Bies and Hansen 1988).

TABLE B.7.2.2-1 Estimated Noise Impacts from the Meter Station					
Nearest NSA and Type of NSA	Distance & Direction of NSA from Station	Existing Sound Level at NSA (dBA)	Estimated Sound Level (L_{dn}) Attributable to Station (dBA)	Total Sound Level (L_{dn}) – Station plus Existing (dBA)	Increase or Decrease from the Existing Sound Level (dBA)
NSA #1 (Residence)	1,750 feet E-NE	53.4	46.2	54.2	0.8
NSA #2 (Residence)	2,300 feet E	42.7	41.3	45.1	2.4

B.8 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5 percent and 15 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. Methane is buoyant at atmospheric temperatures and disperses rapidly in air.

The pipeline and aboveground facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures.

The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. For example, Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues, prescribes the minimum standards for operating and maintaining pipeline facilities, and incorporates compressor station design, including emergency shutdowns and safety equipment. Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials.

Blue Mountain's Project would represent a minimum increase in risk to the public and we are confident that they would be constructed and operated safely.

B.9 CUMULATIVE IMPACTS

Cumulative impacts may result when the environmental effects associated with a project are superimposed on, or added to, either temporary (construction-related) or permanent (operation-related) impacts associated with past, present, or reasonably foreseeable projects or activities. Although the individual impacts of each project might not be significant, the cumulative impacts of multiple projects could be significant. In accordance with NEPA, the cumulative impacts of the Project along with other projects were considered. The Project's direct and indirect impacts are described in the preceding sections of this EA.

Inclusion of other actions is based on identifying commonalities of impacts from other actions along with those of the Project. An action must meet the following criteria:

- impact a resource potentially affected by the proposed action;
- cause the impact within all, or part of, the Project vicinity; and
- cause the impact within all, or part of, the time span of the Project.

Existing or reasonably foreseeable actions that would affect similar resources during similar periods as the Project were considered. To evaluate potential cumulative impacts, we considered recently completed (one year prior to construction of the Project), current, and reasonably foreseeable future projects within the vicinity of the Project. We attempted to identify major projects, which include infrastructure construction, FERC jurisdictional and non-jurisdictional pipeline projects, commercial and residential developments, and large industrial facilities construction and operation.

Actions outside the proposed Project's geographic scope, as defined below, and timeframe were generally not evaluated because their potential to contribute to a cumulative impact would diminish with increasing distance and time from the Project.

- **Geologic mineral and paleontological resources and soils:** Impacts on these resources would largely be contained within the Project workspaces. Cumulative impacts on geologic mineral and paleontological resources could occur within the same footprint as the project. Impacts on soils would occur as a result of temporary vegetation clearing and ground disturbance activities. Project construction and restoration measures, including erosion control devices, are designed to confine impacts on soils resources to the Project workspaces.
- **Cultural resources:** Impacts on cultural resources are highly localized and generally confined to the historic property or resource that is affected. Therefore, the geographic scope for cultural resources impacts is limited to

the Project Area of Potential Effect, and encompassing any overlapping effects to cultural resources and historic properties.

- **Groundwater and surface water resources, wetlands, vegetation, wildlife, and fishery resources:** Impacts on water/wetland, vegetation, wildlife, and fishery resources would occur as a result of temporary ground disturbance and vegetation clearing, construction dewatering, and hydrostatic testing activities during construction. Impacts on water resources are traditionally assessed on a watershed level. Impacts on biological resources may also use the watershed scale as it provides a natural boundary and geographic proxy to accommodate wildlife habitat and ecosystem characteristics in the Project area. Therefore, the cumulative impacts analysis for these resources is focused on those projects that occur within the same Hydrologic Unit Code (HUC) 12 sub-watersheds crossed by the Project.

- **Land use and recreational resources:** Impacts on land use and recreational resources would occur as a result of temporary vegetation clearing, ground disturbance, and increases in noise and dust during construction activities. The cumulative impacts analysis for land use and recreational resources is focused on those projects that occur within 1 mile of the Project.

- **Visual Resources:** Impacts on visual resources may extend outside of the Project footprint to include projects in the same viewshed that would be affected by the Project facilities. Impacts on visual resources near the Project were assumed to extend up to 1 mile.

- **Air Quality:** Temporary impacts on air quality, including fugitive dust, would be largely limited to areas within 0.25 mile of active construction. Since the Project would result in minimal operational emissions that would be negligible, long-term impacts on air quality from Project operation were not evaluated.

- **Noise:** Impacts from construction and operation noise could potentially contribute to cumulative impacts or overlap with noise from other construction projects, which would be limited to areas within 0.25 mile of Project construction workspaces and 0.5 mile from HDD operations.

The projects considered in the cumulative impacts analysis are listed in table B.9-1, and shown on figure B.9-1. The potential cumulative impacts associated with each resource are discussed in the following subsections.

The Project is expected to have no impact or a negligible impact on geologic resources and geologic hazards, land use, cultural resources, groundwater, operational air

quality, and operational noise. Therefore, we conclude that the impacts from this Project, when considered cumulatively with past, present, and reasonably foreseeable projects, would not contribute to significant cumulative impacts on these resources, and these resources will not be discussed further in this section.

TABLE B.9-1
Past, Present, and Reasonably Foreseeable Projects Considered in the Cumulative Impacts Analysis

Project (Project Proponent) (Map No.)	Project Description	Estimated Construction Timeframe	Project Size	Closest Distance from Project [a]	Resources Potentially Affected within the Project's Geographic Scope
Industrial Developments					
Chisholm Trail Cryogenic Gas Complex (Blue Mountain Midstream, LLC) (1)	Construction of a 225 MMcf/d cryogenic gas processing facility with a total capacity of 250 MMcf/d	Construction – Current Operation – 2Q2018	Information Unavailable [b]	0 [c]	Soils; Water Resources; Fish, Wildlife, and Vegetation; Noise (Construction); Air Quality (Construction)
Utility Projects					
Irrigation Field Project (Amber Rural Water District) (2)	Development of a new irrigation field	Completed 2016	11 acres	1.9 miles east	Water Resources; Fish, Wildlife, and Vegetation
Midship Project (Midship Pipeline Company, LLC) (3)	Approximately 234 miles of new natural gas pipelines, three new compressor stations, a booster station, and associated ancillary facilities all located in Oklahoma	May 2018 – April 2019	3,121 acres	Crosses Line 128 near MP 2.2	Soils; Water Resources; Fish, Wildlife, and Vegetation; Noise (Construction); Air Quality (Construction)
Chisholm Trail Project (Southern Star Central Gas Pipeline, Inc.) (4)	Approximately 4.7 miles of new natural gas pipeline and one new compressor station.	January 2018 – May 2018	46.74 acres	Interconnects at the metering and pigging facility	Soils; Water Resources; Fish, Wildlife, and Vegetation; Noise (Construction); Air Quality (Construction)
Non-Jurisdictional Facilities					
Non-Jurisdictional Power Line (5)	Construct approximately 0.5 mile overhead electric power line	Concurrent with the proposed Project	0.5 mile	Interconnects at the metering and pigging facility	Soils; Water Resources; Vegetation, Wildlife; Fish; Visual Resources; Noise (Construction); Air Quality (Construction)

TABLE B.9-1
Past, Present, and Reasonably Foreseeable Projects Considered in the Cumulative Impacts Analysis

Project (Project Proponent) (Map No.)	Project Description	Estimated Construction Timeframe	Project Size	Closest Distance from Project [a]	Resources Potentially Affected within the Project's Geographic Scope
Unspecified oil and gas development projects[d]	Various	Various	Various	Within Grady County	Water Resources; Vegetation, Wildlife; Fish; Noise (Construction); Air Quality (Construction)

[a] Distance is measured from nearest portion of Project workspace from the identified Project's location.
[b] Information unavailable based on publicly available data.
[c] Project is within the proposed Project footprint.
[d]Generalized statement based on common knowledge and historical production

Soils

Line 127 begins within the Chisholm Trail Cryogenic Gas Complex; resulting in an overlap of project footprints. In addition, the Midship Project, if approved by the Commission, would cross Line 128 near MP 2.2 soon after construction of the proposed Project is complete. Finally, the Blue Mountain Chisholm Trail Project and non-jurisdictional facilities necessary to provide power to the proposed metering and pigging facility would interconnect with the proposed Project at the metering and pigging facility and are anticipated to be constructed concurrent with the Project. Concurrent or consecutive construction schedules could prolong the duration that soils would be disturbed and thus susceptible to erosion and invasive species establishment. Due to the limited extent of overlapping footprints as well as soil conservation and restoration measures that would be implemented by all projects to prevent erosion and stabilize disturbed areas, cumulative impacts on soils are anticipated to be short-term and not significant.

Water Resources

Cumulative impacts on surface water and wetlands, (primarily due to increased turbidity or contamination due to spills), could extend outside of the Project workspaces, but would be contained to a relatively small area (i.e., within the same HUC 12-digit sub-watersheds). The Project and all three of the other projects considered for cumulative impacts on water resources are within the Salt Creek HUC 12 watershed (HUC: 111303020908). No wetlands or waterbodies would be impacted by the Cryogenic Complex or Irrigation Field Project, therefore no cumulative impacts on surface water resources are anticipated to occur as a result of these projects.

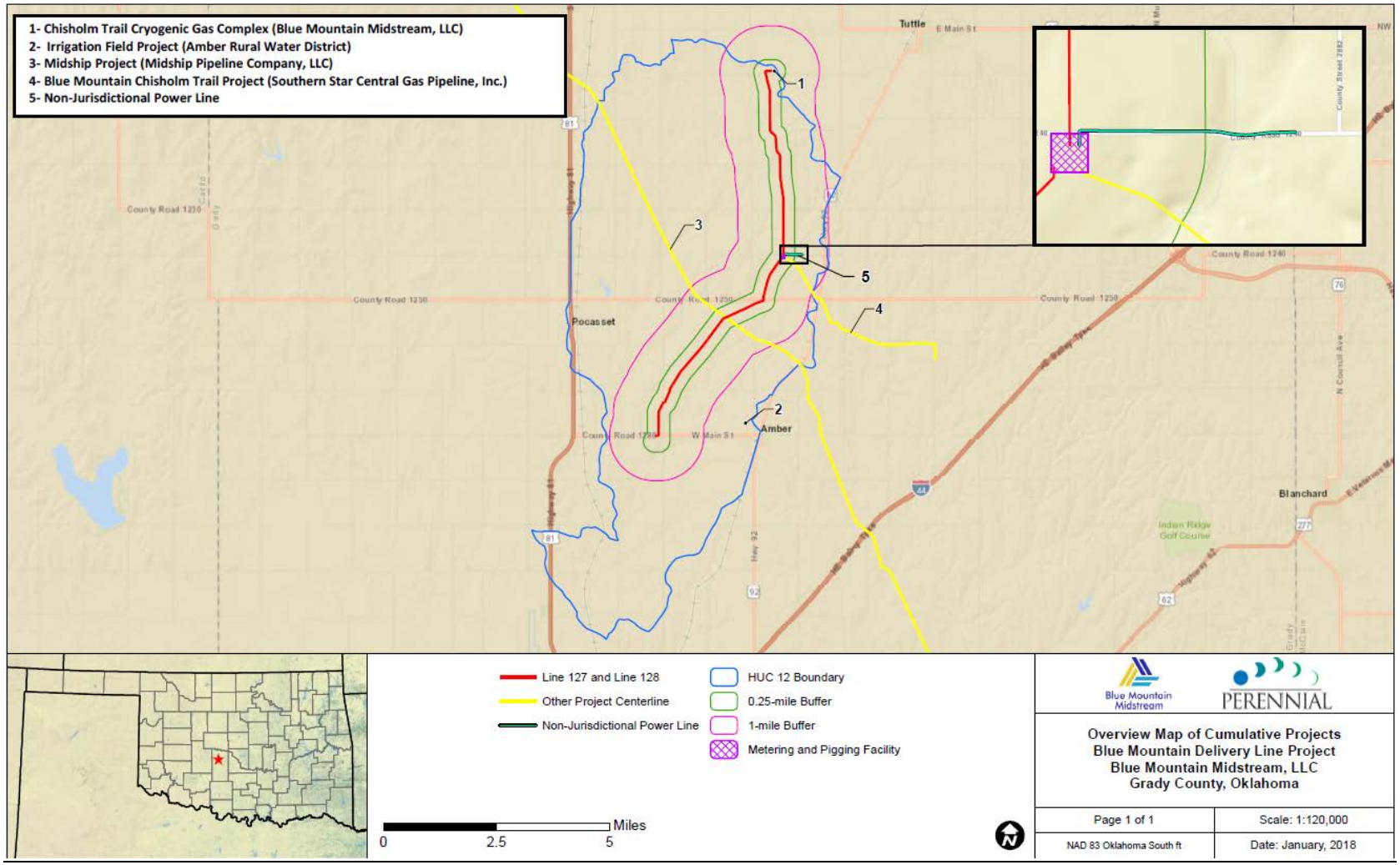

Figure B.9-1 Overview Map of Cumulative Projects

Based on the projected construction schedule, the Midship Project would cross Line 128 near MP 2.2 soon after completion of the Project. While no waterbodies would be crossed by the Midship Project or Chisholm Trail Project in the same exact location as the Project, impacts on Salt Creek tributaries would occur from the Blue Mountain Delivery Line (12 crossings), Chisholm Trail (1 crossing), and Midship (2 crossings) Projects. Three waterbody crossings could require blasting. Approximately 11.6 acres of temporary impacts, and 7.0 acres of permanent impacts on wetlands would occur as a result of the Midship Project.

The Chisholm Trail Project would interconnect with the Project at the metering and pigging facility and is anticipated to be constructed concurrent with the Project. The Chisholm Trail Project crosses one unnamed tributary of Salt Creek via HDD and six other waterbodies via open-cut methods. Two PEM wetlands, totaling 0.03 acre of temporary impact, would be crossed for the Chisholm Trail Project.

Although the non-jurisdictional power line is expected to cross an unnamed tributary of Salt Creek, which is also crossed by Line 128 at MP 0.55, it is anticipated that the power line can be constructed over the stream, avoiding any in-water activities.

Oil and gas development projects are ongoing with approximately 5,830 active wells in Grady County alone. However, these are existing wells with minimal to no impact on water resources during operation of the wells. Should new wells be constructed concurrently to the Project's construction, it is likely, that these wells would contribute to cumulative impacts on water resources within the Salt Creek HUC 12 watershed. Impacts from construction of these wells would likely be similar to those discussed previously for the Project (short-term).

The extended period of disturbance in and around the waterbodies as a result of the concurrent and consecutive construction activities could temporarily increase turbidity and sedimentation as well as increase the potential for erosion. As discussed in section B.3.2, impacts on surface waterbodies associated with the Project would be short-term and minor, as all waterbodies would be crossed in 24 to 48 hours in accordance with the FERC Procedures. Further, banks would be restored and stabilized to minimize potential for erosion and stream scour following construction. Given the Midship Project and Chisholm Trail Project are also FERC-jurisdictional projects, the applicants would adhere to the measures in our Procedures. Therefore, cumulative impacts on surface waterbodies as result of the Project are anticipated to be short-term and not significant.

Fisheries, Vegetation, and Wildlife

The geographic scope for fish, wildlife, and vegetation was considered to be Salt Creek HUC 12 watershed (HUC: 111303020908). Existing oil and gas wells would not

likely contribute to impacts on fisheries. However, it is likely that new oil and gas development projects within Grady County could contribute to cumulative impacts on fisheries within the Salt Creek HUC 12 watershed in a similar manner as Blue Mountain's Project. Additionally, as discussed in the previous section for water resources, two of the other projects considered for cumulative impacts would not impact waterbodies; however, the Midship Project and the Chisholm Trail Project are anticipated to cross some of the same waterbodies as the Project concurrently or shortly after completion of construction.

The Midship Project would cross several waterbodies that provide recreational fishing opportunities, including the North Canadian and Canadian Creeks, Blue River, Pennington Creek, and Wildhorse Creek. The Chisholm Trail Project facilities would cross freshwater waterbodies, including two manmade ponds and perennial, intermittent, and ephemeral streams. Intermittent and perennial streams could support various freshwater fish species.

Cumulative impacts and mitigation measures on fisheries would be similar to those discussed above for surface water resources. Therefore, cumulative impacts on fisheries are also anticipated to be short-term and not significant.

The Project would primarily impact open land habitat, consisting of improved pasture, hay, and actively cultivated row crops. With the exception of the metering and pigging facility, impacts associated with the Project would be temporary (see Section B.4.2). The Cryogenic Complex would result in the construction and operation of a new industrial facility, which would permanently convert open land (agricultural) to industrial land. Similarly, the metering and pigging facility would also result in the permanent conversion of open land (primarily agricultural) to industrial land. The Irrigation Field Project was completed in 2016 and, based on current and historical aerial imagery, did not result in a change in vegetation or habitat type. New oil and gas development projects within Grady County would contribute to cumulative impacts on vegetation and wildlife within the Salt Creek HUC 12 watershed in a similar manner as the aboveground facilities for the Blue Mountain Delivery Line Project. Impacts associated with the Midship Project, the Chisholm Trail Project, and the non-jurisdictional power line are anticipated to be similar to the Project, with temporary construction impacts and most habitat types returning to pre-construction conditions following the completion of construction activities. Because construction of the Midship Project is scheduled to begin immediately following completion of the Project, the duration of habitat disturbance would be prolonged. However, due to the abundance of open land in the Salt Creek HUC 12 sub watershed and the limited suitability of actively cultivated areas to serve as wildlife habitat, cumulative impacts on vegetation and wildlife habitat are anticipated to be minimal.

The Project would have no effect on threatened and endangered species potentially occurring within the Project area, with the exception of the whooping crane, which is not likely to be adversely affected by the Project. This species could occur in the Chisholm Trail Project area, and could use the area during migration, but would leave the area if disturbed and go to suitable habitat nearby. Therefore, we conclude that project is also not likely to adversely affect the whooping crane. Finally, we conclude the Midship Project is also not likely to adversely affect whooping crane. If whooping cranes are observed within the Midship project area during construction, activities would stop, the FWS would be notified, and construction activities would resume when cranes have left the area and the FWS gives approval. Due to the rarity and only occasional use of the Delivery Line Project area as stop over habitat during whooping crane migration (see section B.4.3), cumulative impacts on the whooping crane are not anticipated.

Air Quality

Construction of the Project would result in short-term and temporary impacts on air quality in the Project area. Construction would involve the use of heavy equipment that would generate emissions of air pollutants and fugitive dust. Construction equipment emissions would result in short-term emissions that would be highly localized, temporary, and intermittent. In order to mitigate fugitive dust emissions, Blue Mountain would implement dust control measures such as watering access roads and construction areas.

Construction of the Project may occur concurrently with construction of the Cryogenic Complex, Midship, Blue Mountain Chisholm Trail, the non-jurisdictional power line projects, as well as other oil and natural gas-related development and would contribute cumulatively to impacts on air quality. Based on the mitigation measures proposed by Blue Mountain included in our Plan, the likely similar mitigation measures that would be implemented by the other projects, and the temporary and localized impacts of construction, the proposed Project would not result in significant cumulative impacts on air quality during construction.

Noise

Construction of the Project would result in short-term and temporary impacts on existing noise levels in the Project area. Construction of the Project may occur concurrently with construction of the Cryogenic Complex, Midship, Chisholm Trail, the non-jurisdictional power line projects, as well as other oil and natural gas-related development and would contribute cumulatively to impacts on noise levels. However, based on the short-term and temporary nature of construction-related activities, impacts from the Project are not expected to significantly contribute to overall cumulative impacts on noise levels during construction.

B.10 RELATED FACILITIES

The Blue Mountain Delivery Line Project would directly connect to and take gas away from the non-jurisdictional Cryogenic Complex (as shown in figure A.5.1-1). According to Blue Mountain, the Cryogenic Complex is a highly efficient, state-of-the-art cryogenic gas processing system with a total capacity of 250 million cubic feet per day and is expected to be commissioned during the second quarter of 2018. It is currently under construction. Limited public information was available for this facility.

The Cryogenic Complex would result in the construction and operation of a new industrial facility, which would permanently convert agricultural land to industrial land. No wetlands or waterbodies would be impacted by the Cryogenic Complex. Temporary impacts on soils would occur during construction; however, mitigation measures would be implemented at the Cryogenic Complex to prevent erosion and stabilize disturbed areas.

The Cryogenic Complex would result in both construction and operational air emissions. Blue Mountain Midstream (formerly Linn Operating, LLC) submitted a *Minor Source General Permit for Oil and Gas Facilities- Notice of Intent to Construct/Operate* to the Oklahoma Department of Environmental Quality on June 29, 2017. The permit is currently pending completion of construction and is anticipated to be issued prior to operation. The Cryogenic Complex qualifies as a minor source of pollutant emissions for air quality permitting. Based on estimates provided in the permit, the Cryogenic Complex would potentially emit 23.1 tpy of nitrogen oxides, 22.4 tpy of CO, 62.9 tpy of VOC, 0.1 tpy of sulphur dioxide, and 9.0 tpy of HAPs. No other pollutants (including CO_{2e}) were reported in the permit. We estimate[5,6] at most 317,000 metric tons of GHG (as CO_{2e}) would be emitted per year from the facility.

[5] Calculations assume 74.3 percent methane by-mass in pre-processed gas. *Life Cycle Analysis of Natural Gas Extraction and Power Generation*, Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory (DOE/NETL-2015/1714), August 30, 2016, Table 3-2, Central - Conventional, Tight Gas and Shale

[6] *Life Cycle Analysis of Natural Gas Extraction and Power Generation*, Department of Energy, Office of Fossil Energy, National Energy Technology Laboratory (DOE/NETL-2014/1646), May 29, 2014, Figure ES-2

SECTION C – ALTERNATIVES

In preparing this EA, we considered several alternatives to the proposed action to determine whether they would be environmentally preferable over the Project. These alternatives include the no-action alternative, system alternatives, pipeline route alternatives, and aboveground facility location alternatives. In evaluating alternatives, the following criteria are used to determine whether an alternative would be environmentally preferable:

- ability to meet the Project's stated objective (contribute an additional 225 million cubic feet per day of natural gas supply to markets in Oklahoma and neighboring states);
- technical and economic feasibility and practicality; and
- whether the alternative provides a significant environmental advantage over the proposed action.

Through environmental comparison and application of our professional judgment, each alternative is considered to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria. Alternatives that do not meet the Project's objective or are not feasible are not brought forward to the next level of review (i.e., the third evaluation criterion). Determining if an alternative provides a significant environmental advantage requires a comparison of the impacts on each resource as well as an analysis of impacts on resources that are not common to the alternatives being considered. Ultimately, an alternative that results in equal or minor advantages in terms of environmental impact would not compel us to shift the impacts to another location, potentially affecting a new set of landowners.

C.1 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, Blue Mountain would not construct the Project. If the proposed facilities were not constructed, the adverse impacts identified in this EA would be avoided; however, the Project objectives would not be met. Existing facilities are not adequate to supply additional pipeline capacity for transportation of natural gas to meet customer demands. If the Commission denied the Project, Blue Mountain would be required to seek other methods of transporting natural gas from the Cryogenic Complex. Such alternative projects could require the construction of new pipeline facilities in the same area to transport the gas volumes proposed by the Project. These projects would result in their own set of specific environmental impacts that could be equal to or greater than those described for the current proposal.

C.2 SYSTEM ALTERNATIVES

The Project would deliver natural gas from Blue Mountain's new Cryogenic Complex to Enable's and Southern Star's existing interstate pipeline system. Because the Cryogenic Complex is new, there is no existing infrastructure that would be able to connect the facility to Enable's pipeline system. As such, there are no other system alternatives that could meet the purpose and need of the overall Project.

C.3 ROUTE AND ABOVEGROUND SITE ALTERNATIVES

Because the proposed route did not present any environmental concerns, no comments were received from stakeholders, and no routes were identified that provide a significant environmental advantage, no additional route alternatives were evaluated.

No site alternatives were identified for the metering and pigging facility, as this site was specifically chosen based on its proximity to other existing natural gas pipeline systems.

C.4 CONCLUSION

No alternatives were identified that provide a significant environmental advantage over the Project design. Therefore, we conclude that the proposed Project is the preferred alternative to meet the Project objectives.

SECTION D – STAFF'S CONCLUSIONS AND RECOMMENDATIONS

Based upon the analysis in this EA, we have determined that if Blue Mountain constructs and operates the proposed facilities in accordance with its application, supplements, and staff's recommended mitigation measures below, approval of the Project would not constitute a major federal action significantly affecting the quality of the human environment. We recommend that the Commission Order contain a finding of no significant impact and that the following mitigation measures be included as conditions to any Certificate the Commission may issue:

1. Blue Mountain shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Blue Mountain must:

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;

    b. justify each modification relative to site-specific conditions;

    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and

    d. receive approval in writing from the Director of the Office of Energy Projects (OEP) **before using that modification.**

2. The Director of OEP, or the Director's designee, has delegated authority to address any requests for approvals or authorizations necessary to carry out the conditions of the Order, and take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:

    a. the modification of conditions of the Order;

    b. stop-work authority; and

    c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from project construction and operation.

3. **Prior to any construction**, Blue Mountain shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel shall be informed of the EIs' authority and have

been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, Blue Mountain shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

   Blue Mountain's exercise of eminent domain authority granted under NGA Section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Blue Mountain's right of eminent domain granted under NGA Section 7(h) does not authorize it to increase the size of its natural gas facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Blue Mountain shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **before construction in or near that area**.

   This requirement does not apply to extra workspaces allowed by the Commission's Plan and/or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

   Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

   a. implementation of cultural resources mitigation measures;

b. implementation of endangered, threatened, or special concern species mitigation measures;

c. recommendations by state regulatory authorities; and

d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the authorization and before construction begins**, Blue Mountain shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Blue Mountain must file revisions to the plan as schedules change. The plan shall identify:

a. how Blue Mountain would implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;

b. how Blue Mountain would incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;

c. the number of EIs assigned, and how the company would ensure that sufficient personnel are available to implement the environmental mitigation;

d. company personnel, including EIs and contractors, who would receive copies of the appropriate material;

e. the location and dates of the environmental compliance training and instructions Blue Mountain would give to all personnel involved with construction and restoration (initial and refresher training as the project progresses and personnel change);

f. the company personnel (if known) and specific portion of Blue Mountain's organization having responsibility for compliance;

g. the procedures (including use of contract penalties) Blue Mountain would follow if noncompliance occurs; and

h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for the:

i. completion of all required surveys and reports;

ii. environmental compliance training of onsite personnel;

iii. start of construction; and

iv. start and completion of restoration.

7. Blue Mountain shall employ at least one EI per construction spread. The EI(s) shall be:

a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;

b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;

c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;

d. a full-time position, separate from all other activity inspectors;

e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and

f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Blue Mountain shall file updated status reports with the Secretary on a **biweekly** basis until all construction and restoration activities are complete. On request, these status reports shall also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. an update on Blue Mountain's efforts to obtain the necessary federal authorizations;

b. the construction status of the Project, work planned for the following reporting period, and any schedule changes for work in environmentally sensitive areas;

c. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);

d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;

e. the effectiveness of all corrective actions implemented;

f. a description of any landowner/resident complaints that may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and

g. copies of any correspondence received by Blue Mountain from other federal, state, or local permitting agencies concerning instances of noncompliance, and Blue Mountain's response.

9. Blue Mountain must receive written authorization from the Director of OEP **before commencing construction of any Project facilities.** To obtain such authorization, Blue Mountain must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. Blue Mountain must receive written authorization from the Director of OEP **before placing the Project into service**. Such authorization shall only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the Project are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service**, Blue Mountain shall file an affirmative statement with the Secretary, certified by a senior company official:

    a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities would be consistent with all applicable conditions; or

    b. identifying which of the conditions in the Order Blue Mountain has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. **Prior to construction,** Blue Mountain shall file with the Secretary the following information for HDD alignments crossing wetlands or waterbodies (HDD-2, -6, -8, & -11):

    a. the results of site-specific geotechnical investigations conducted;

b. a description of the subsurface lithology along the drill path, SPT results, soil mechanic properties/Atterberg Limits, and/or rock coring results including core recovery, and RQD for each bedrock core run (depict the lithology, SPT and RQD data on each HDD profile);

c. an HDD feasibility study conducted by a qualified contractor including an analysis of the potential for hydrofracture and an IR using the USACE Delft method for crossings through unconsolidated material, and/or a qualitative analysis for an IR through bedrock utilizing rock quality designation values obtained from bedrock cores.

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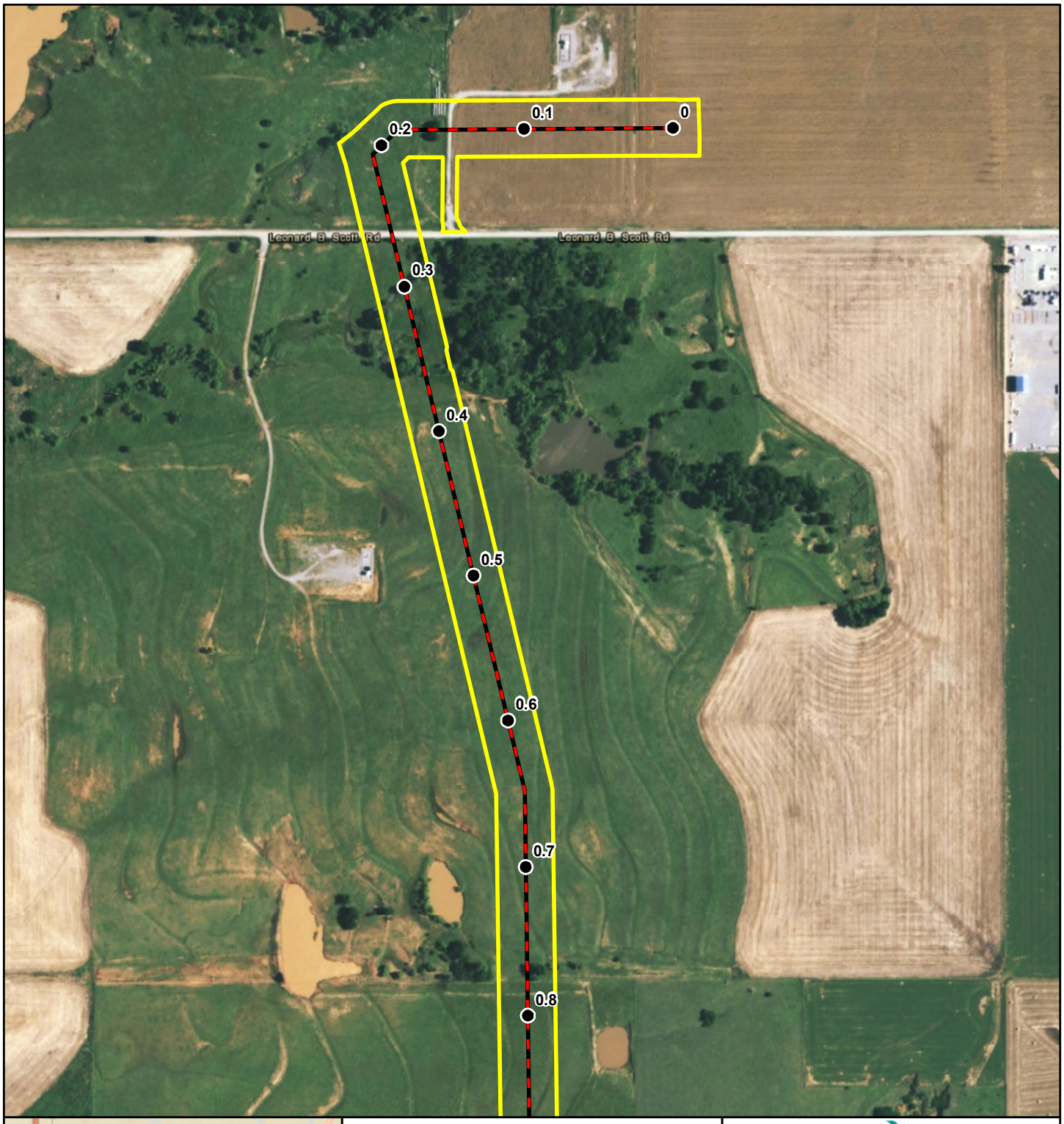
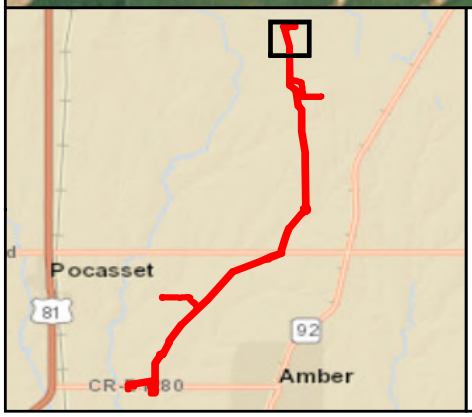
APPENDIX A

Pipeline Route and Site Location Maps





Milepost
Line 127 Centerline
Line 128 Centerline
Survey Area

0 250 500 Feet

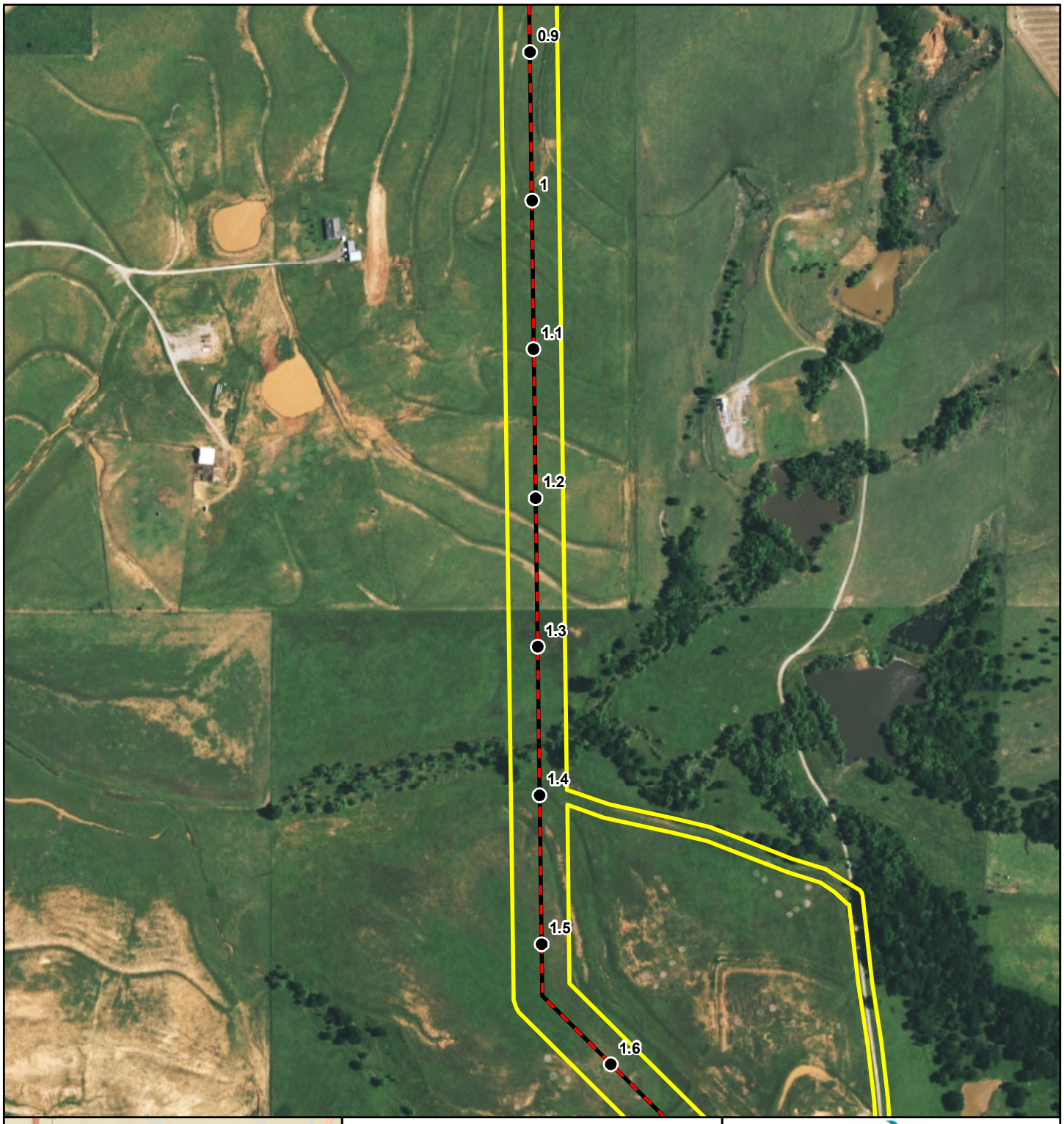
PERENNIAL

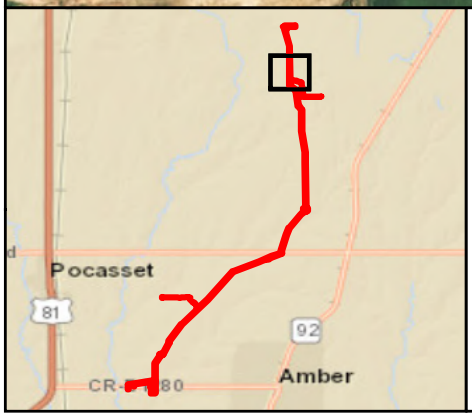
Aerial Map
Blue Mountain Delivery Line Project
Blue Mountain Midstream, LLC
Grady County, Oklahoma

Page 1 of 14	Scale: 1:6,000
NAD83 OK-South ft.	Date: November, 2017

Path: P:\GIS\Client\Linn_Energy\Blue_Mountain_Midstream_Pipeline\Chisolm_Trail\Maps\ENV\T&E\20170912\MXD\2_Aerial.mxd

Author: PW





Milepost
Line 127 Centerline
Line 128 Centerline
Survey Area

Feet
0 250 500

PERENNIAL

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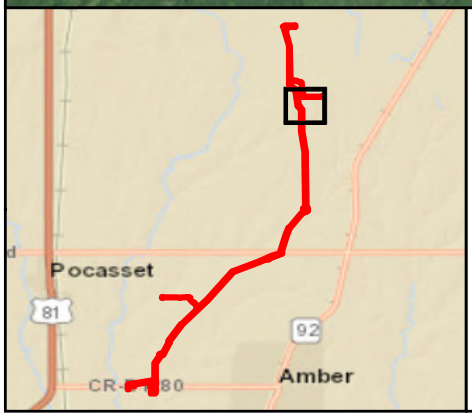
Author: PW



Milepost
Line 127 Centerline
Line 128 Centerline
Survey Area

0 250 500 Feet

PERENNIAL

Aerial Map
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Grady County, Oklahoma

Page 3 of 14	Scale: 1:6,000
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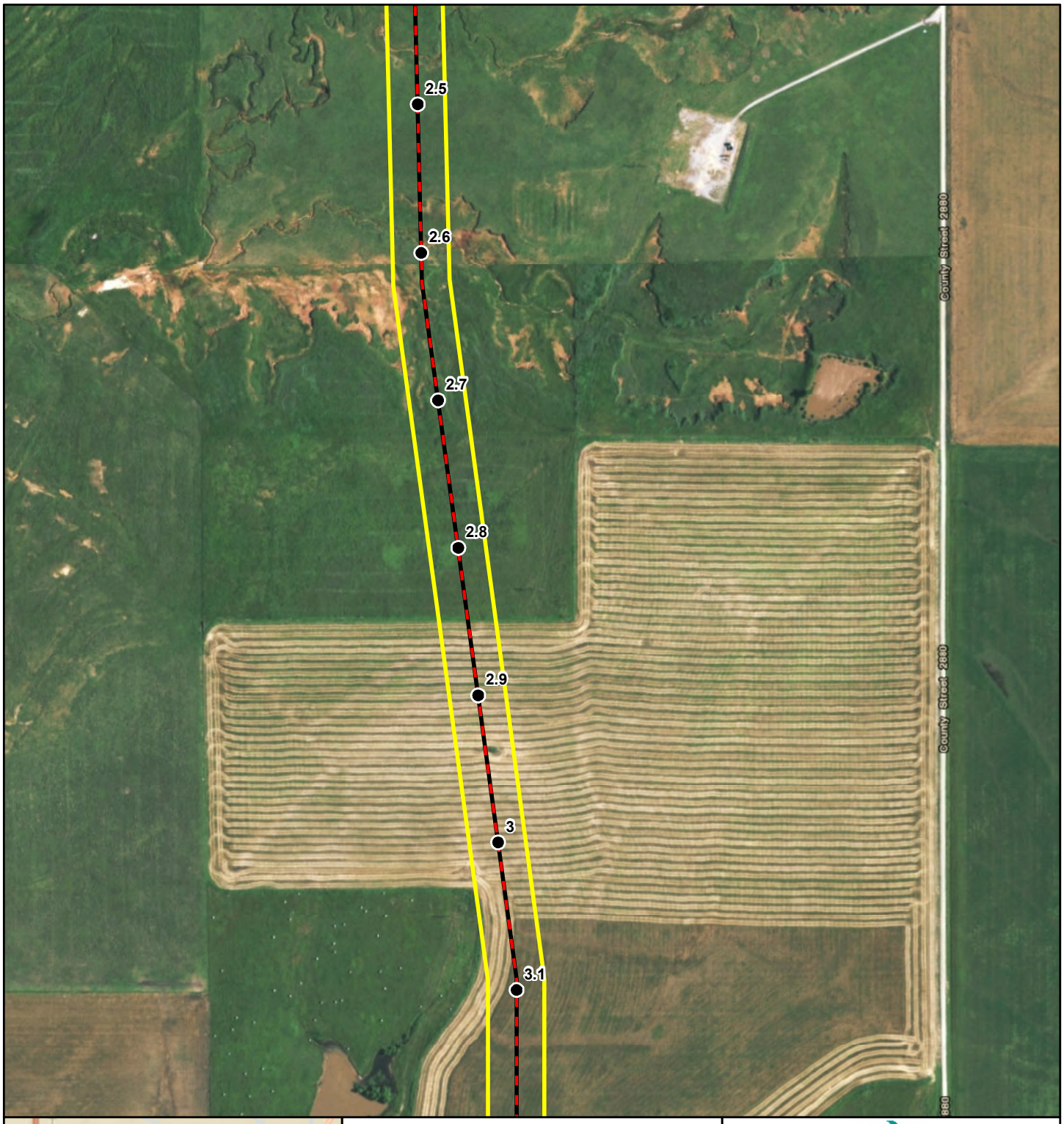

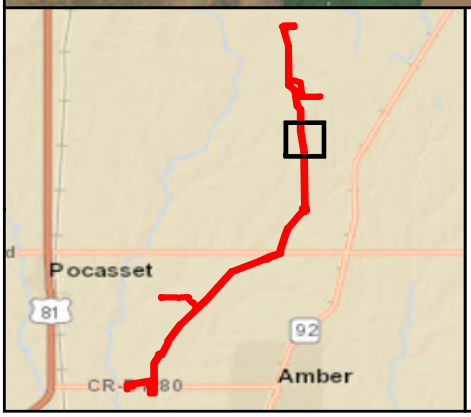

Milepost
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Line 128 Centerline
Survey Area

0 250 500 Feet

PERENNIAL

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Grady County, Oklahoma

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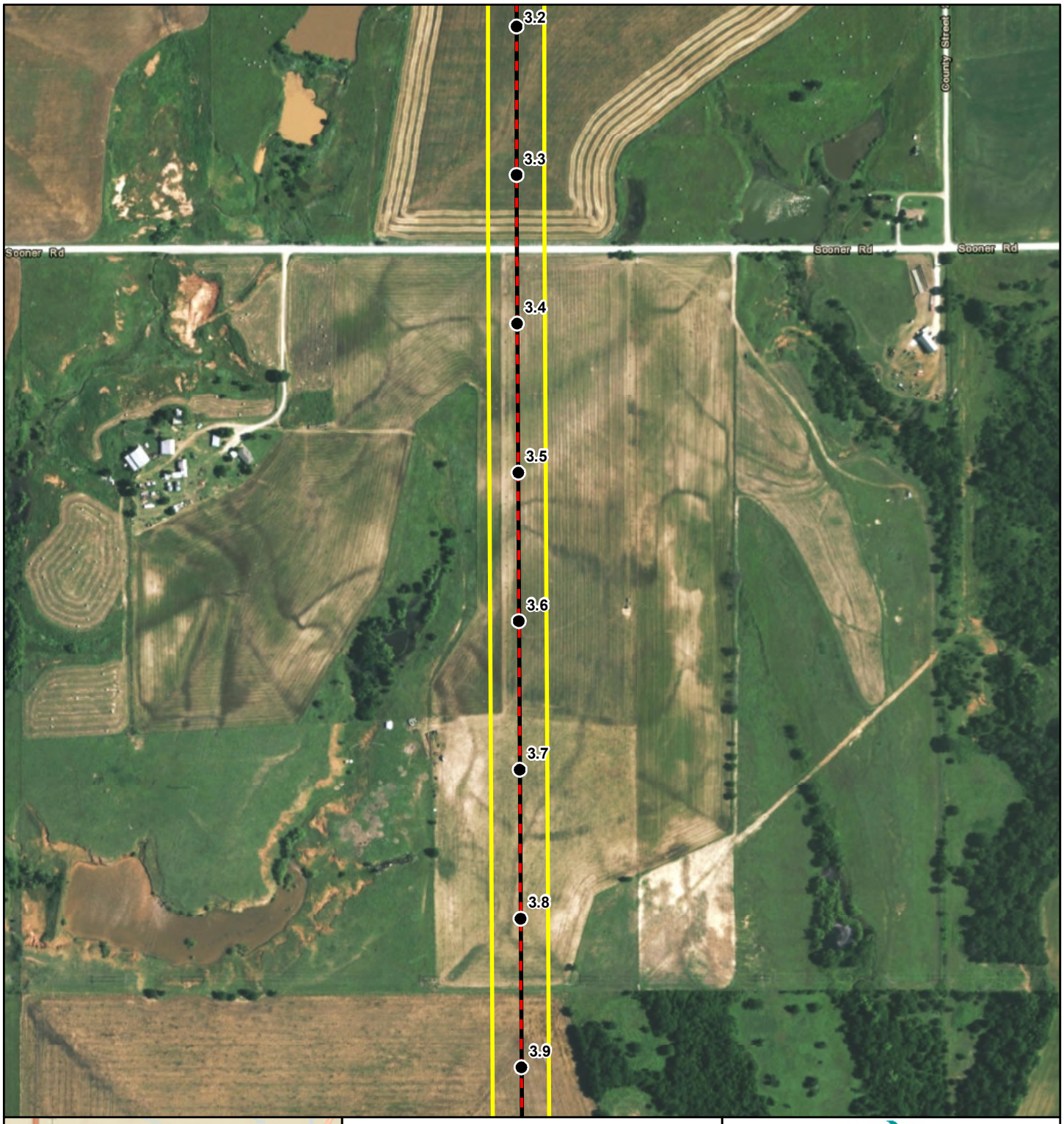

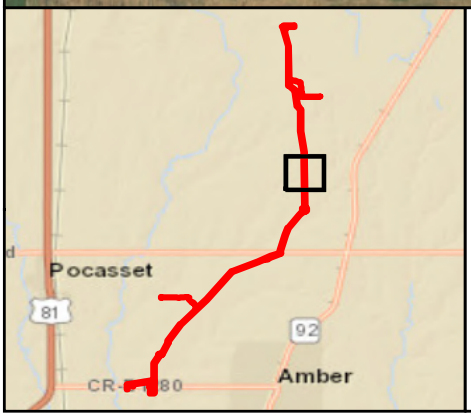

Milepost
Line 127 Centerline
Line 128 Centerline
Survey Area

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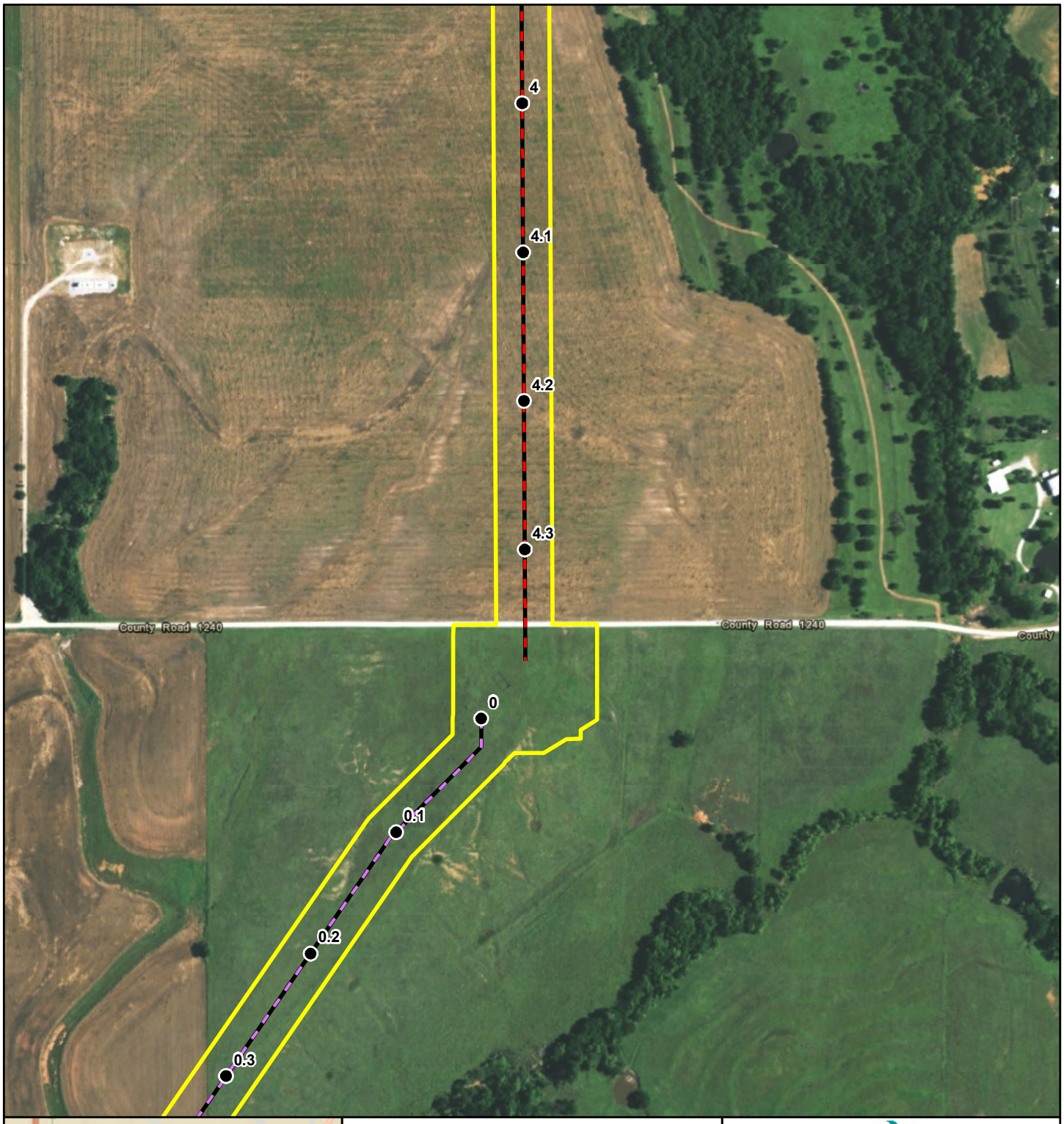

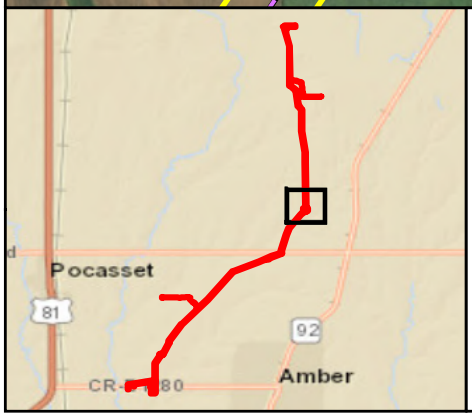

Milepost
Line 127 Centerline
Line 128 Centerline
Survey Area

Feet
0 250 500

PERENNIAL

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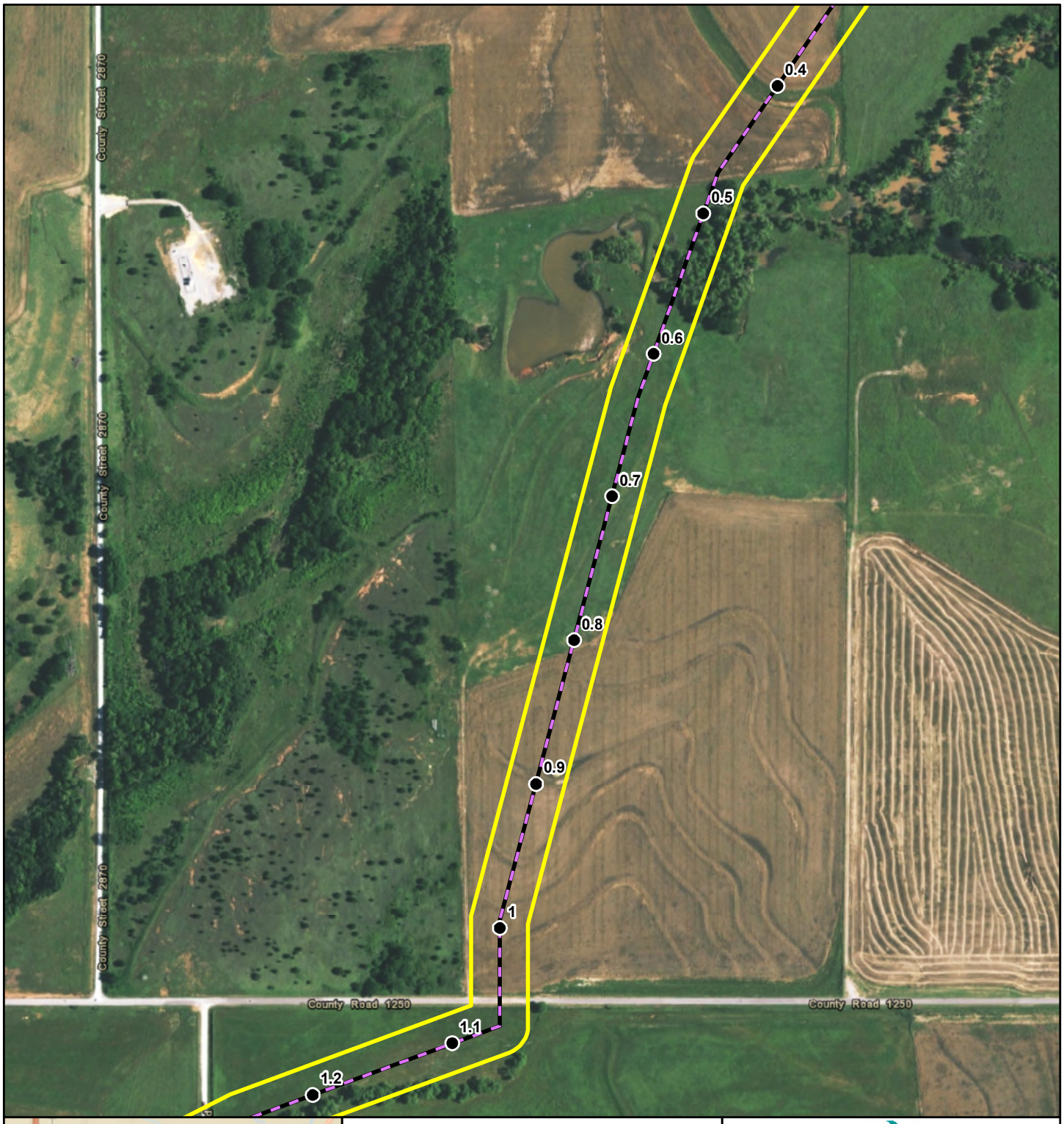

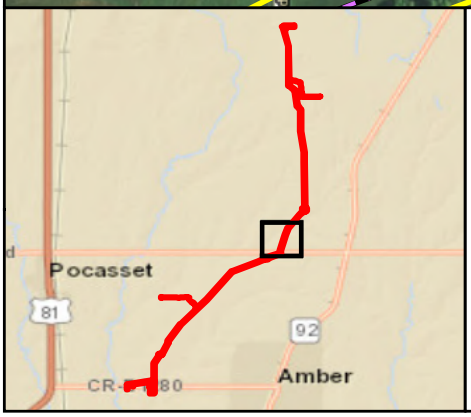

Milepost
Line 127 Centerline
Line 128 Centerline
Survey Area

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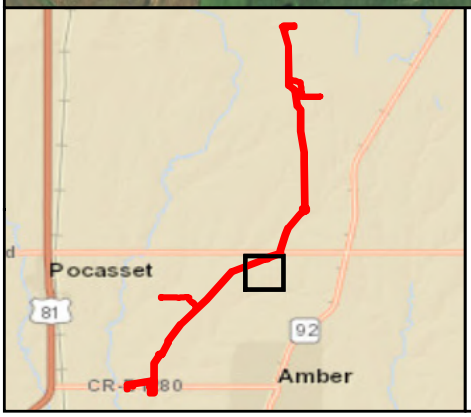

Milepost
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Line 128 Centerline
Survey Area

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Page 8 of 14	Scale: 1:6,000
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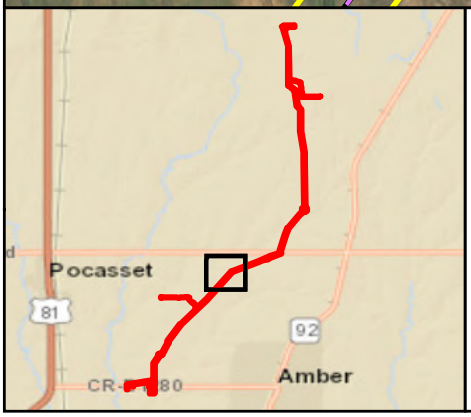

Milepost
Line 127 Centerline
Line 128 Centerline
Survey Area

Feet
0 250 500

PERENNIAL

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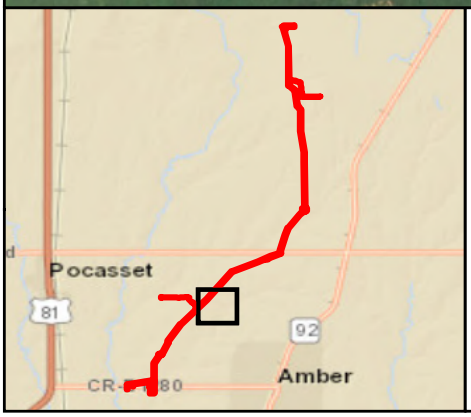

Milepost
Line 127 Centerline
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Survey Area

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Page 10 of 14	Scale: 1:6,000
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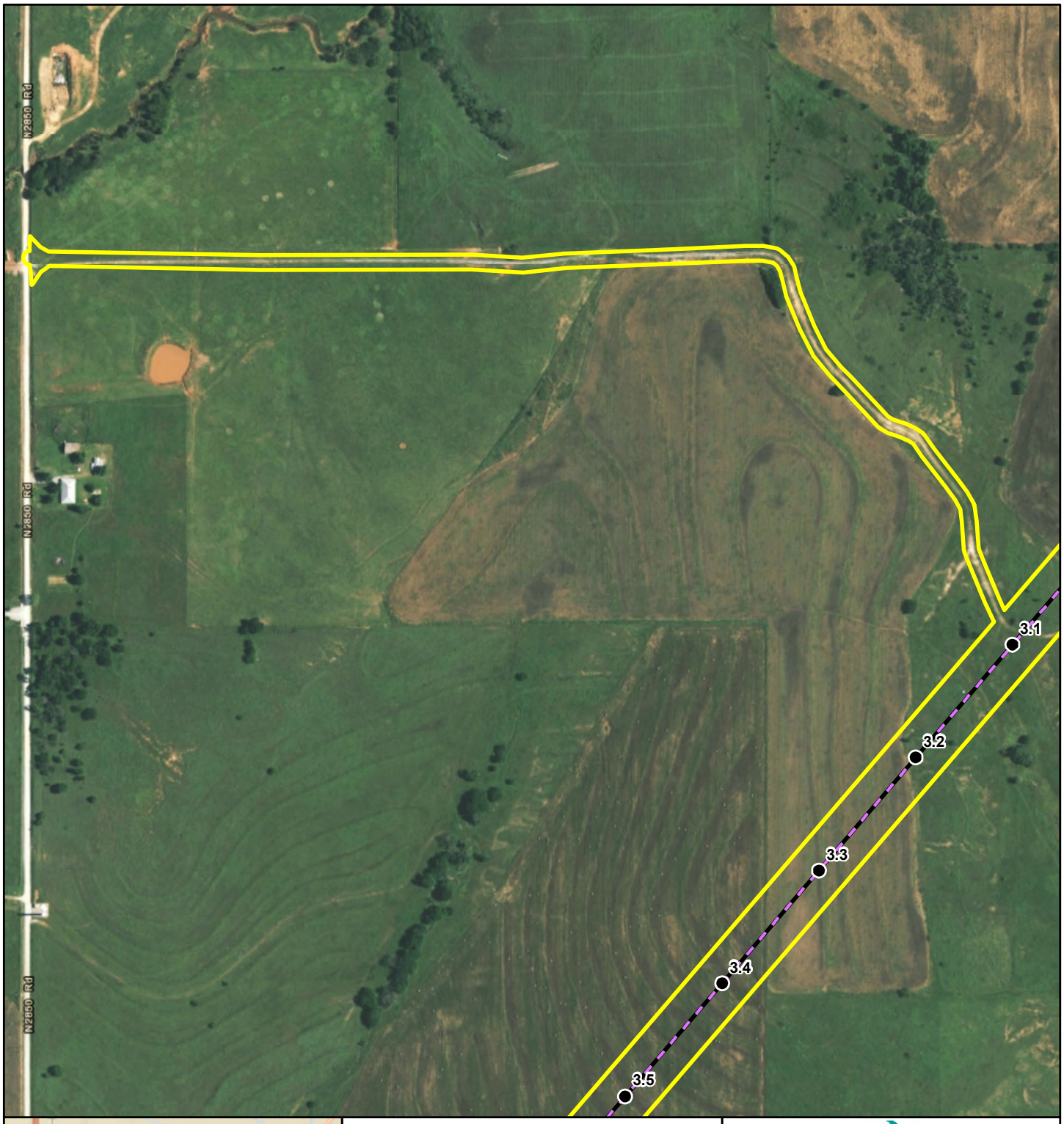

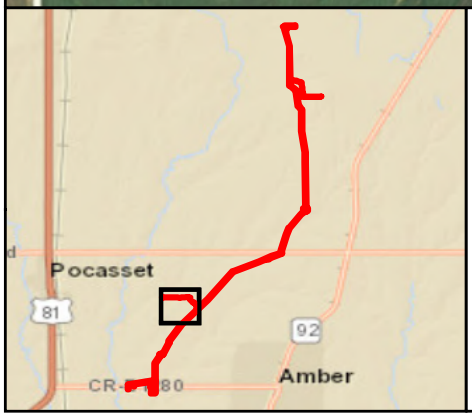

Milepost
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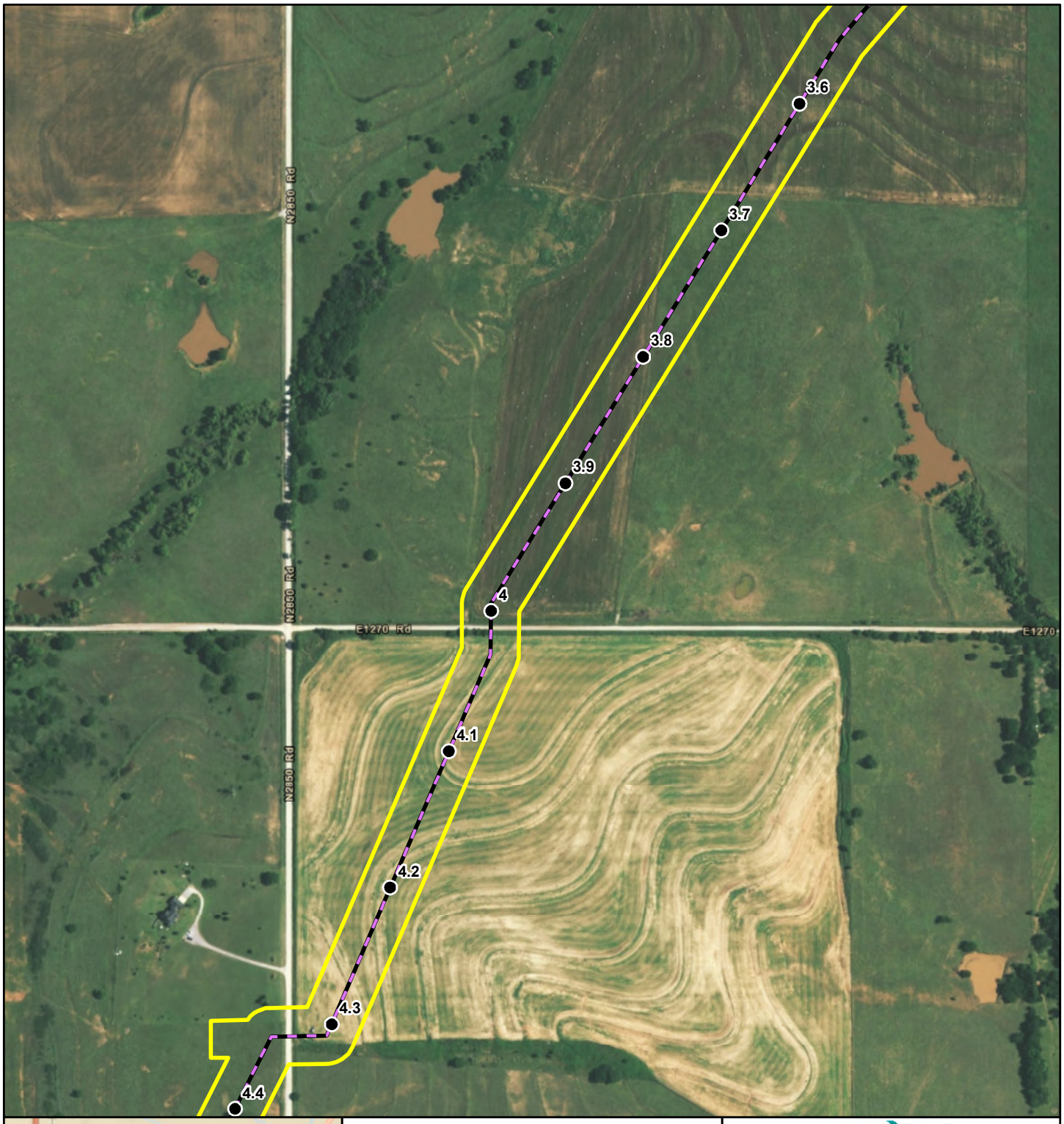

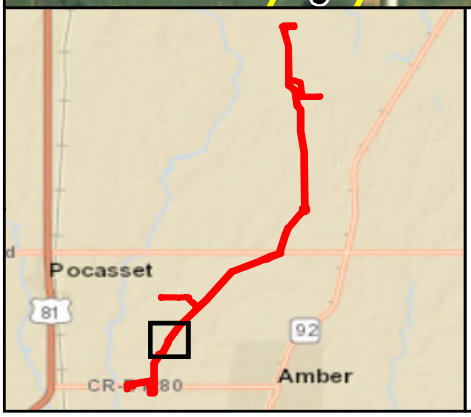

- Milepost
- Line 127 Centerline
- Line 128 Centerline
- Survey Area

Feet
0 250 500

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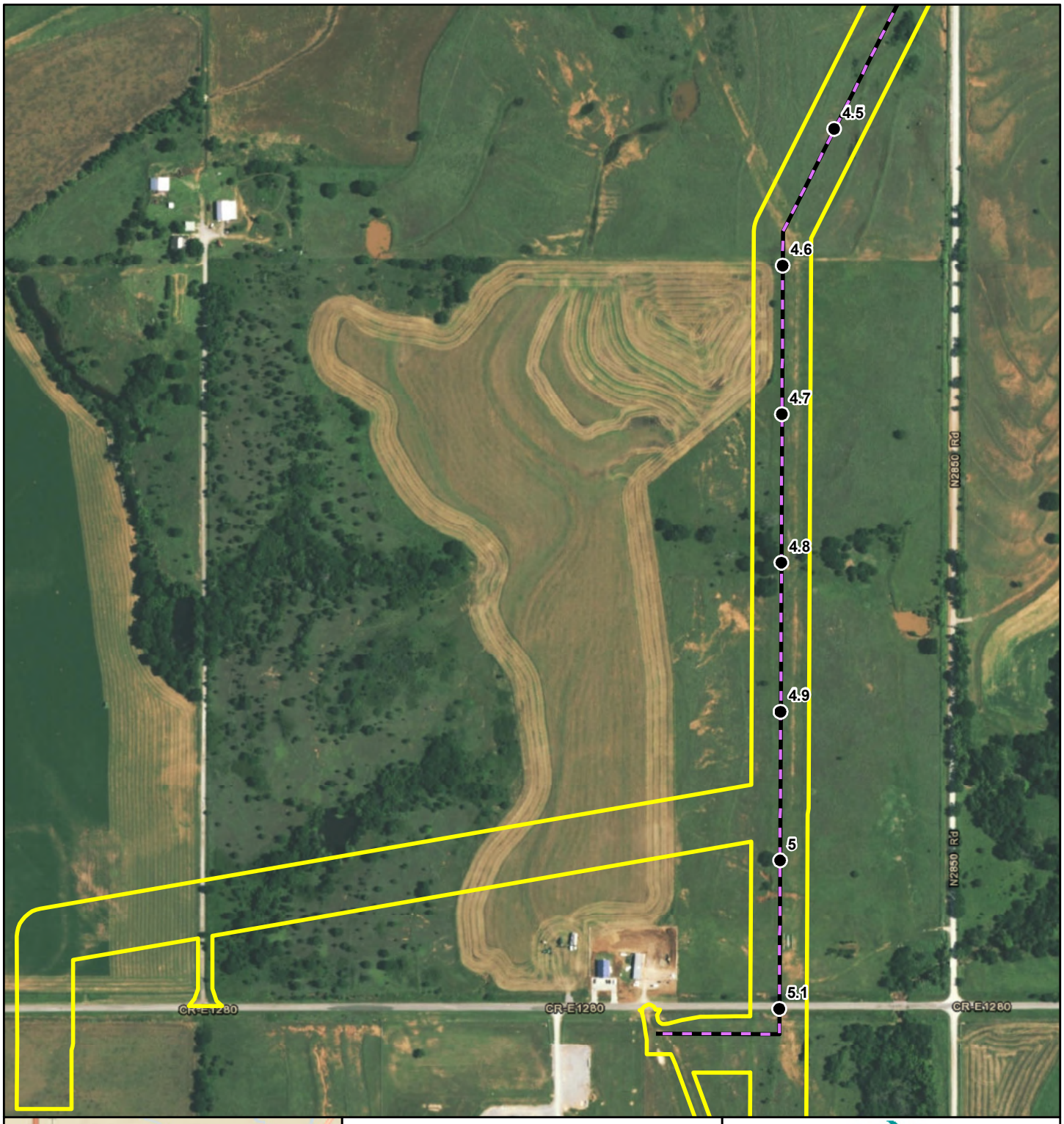

Milepost
Line 127 Centerline
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Survey Area

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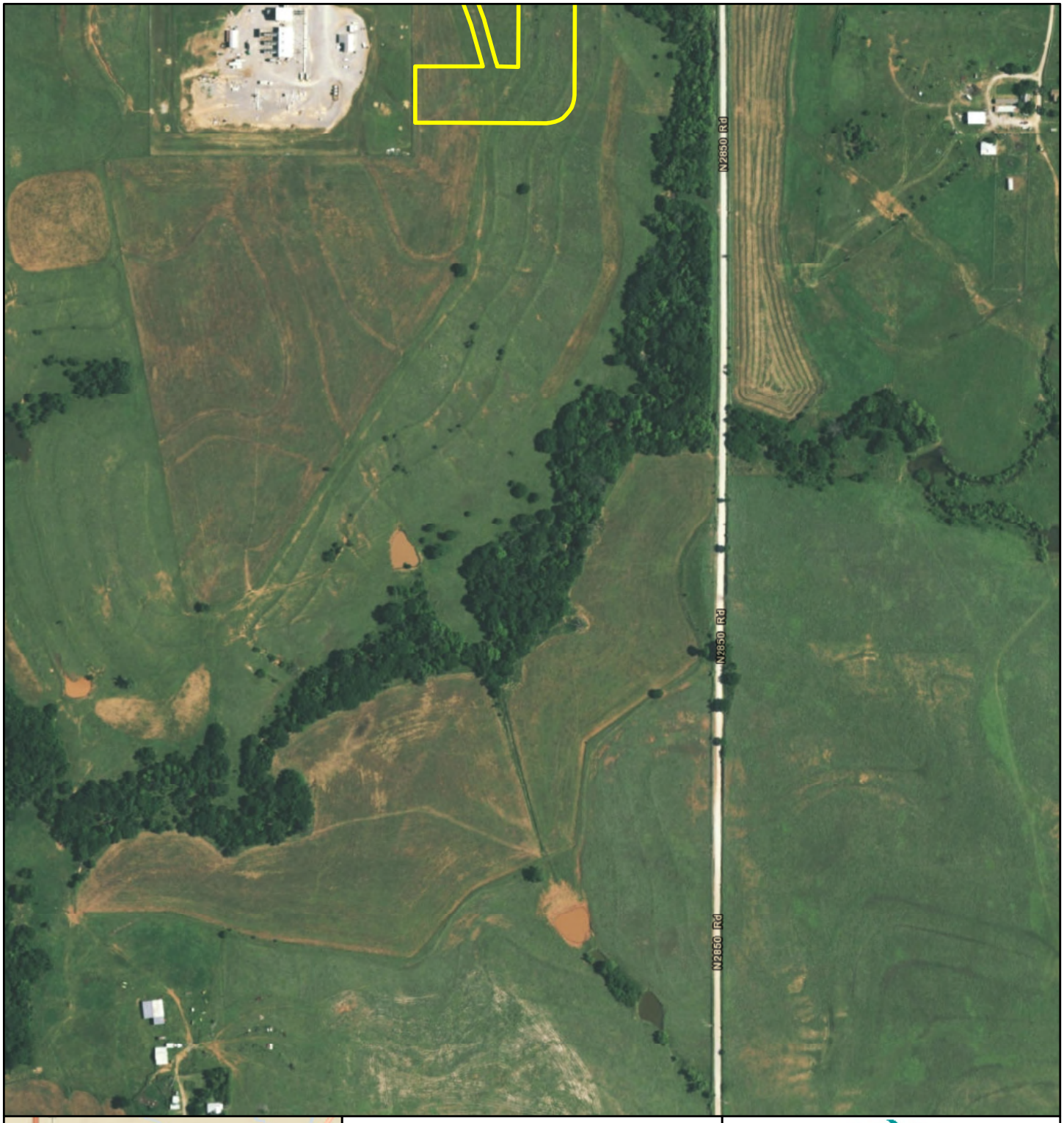

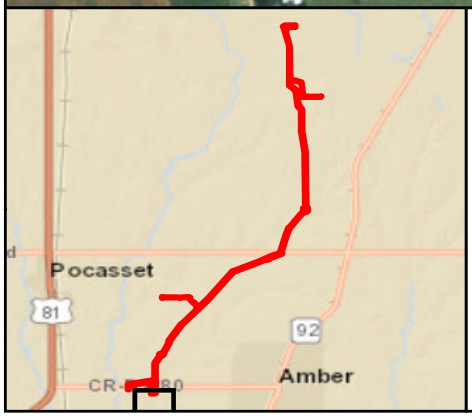

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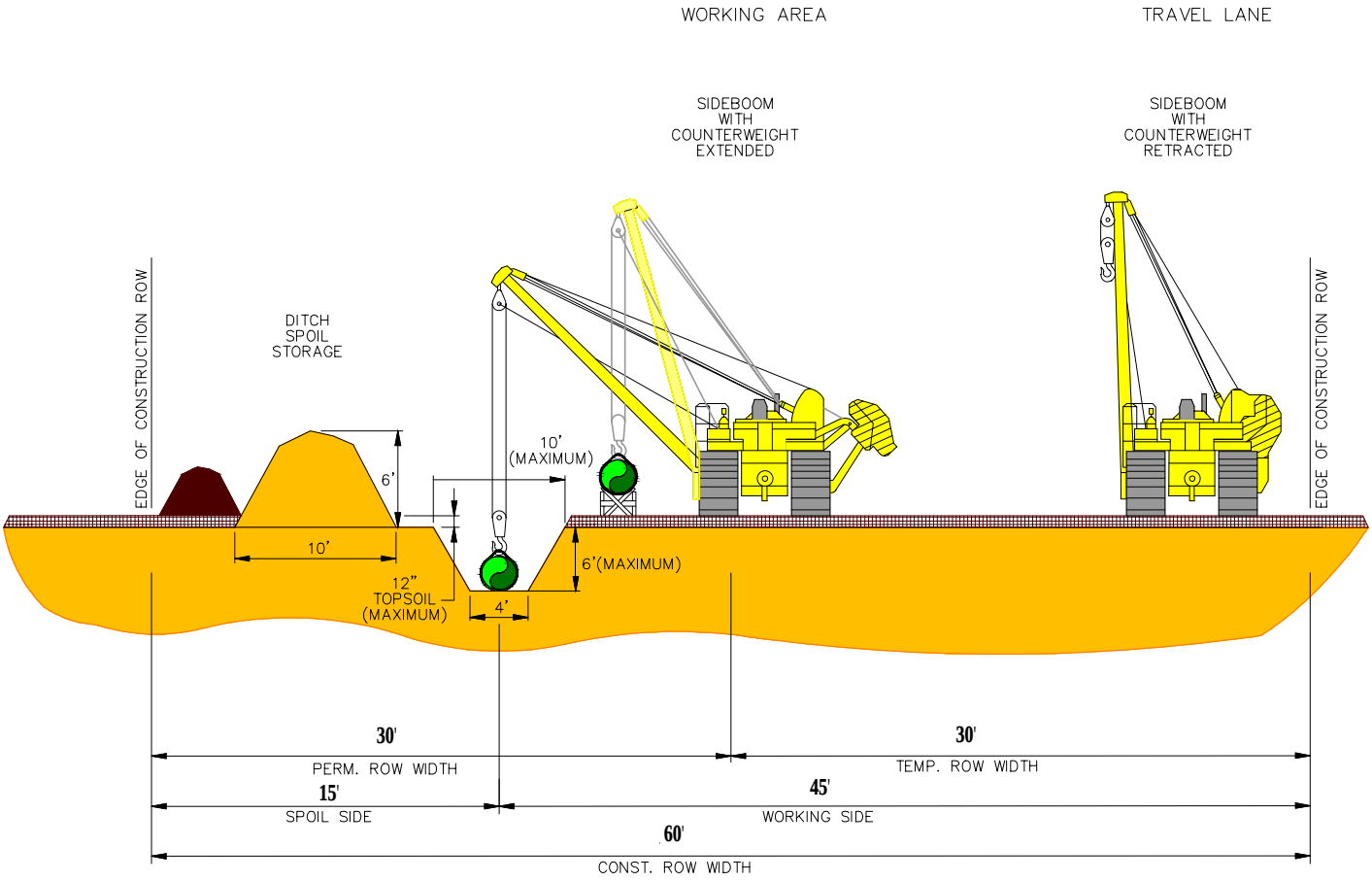
Author: PW

APPENDIX B

Construction Right-of-Way Cross Section Drawings

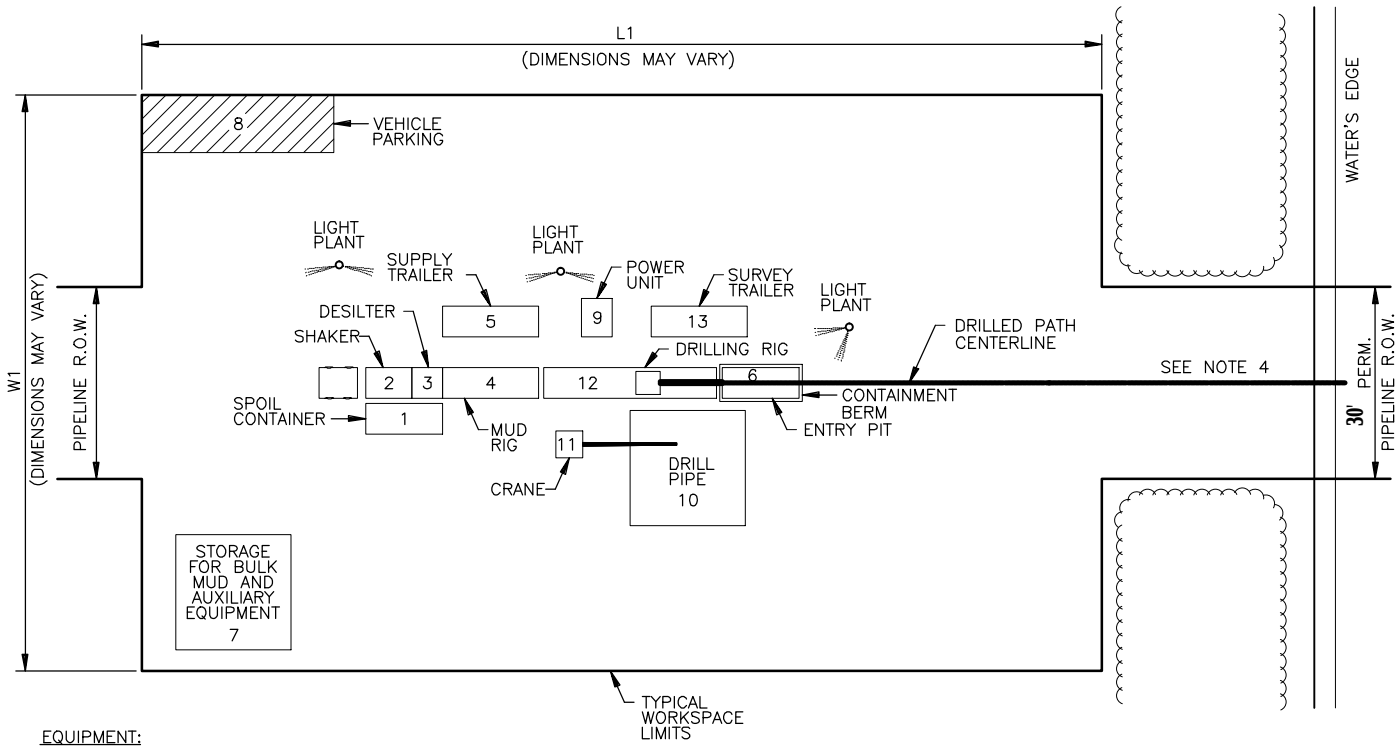


NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

MAINLINE CONSTRUCTION
UPLAND CONSTRUCTION
RIGHT-OF-WAY

DRAWING NUMBER	SHEET
TYP-001	1 OF 1



EQUIPMENT:

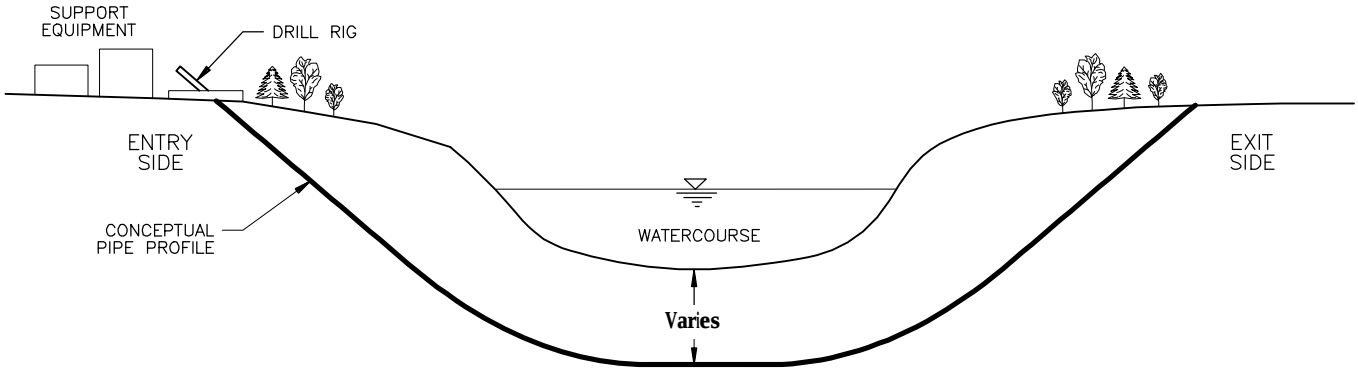
1. SPOIL CONTAINER: 8' x 20'
2. SHAKER: 8' x 12'
3. DESILTER: 8' x 8'
4. MUD RIG: 8' x 25'
5. SUPPLY TRAILER: 8' x 25'
6. ENTRY PIT: 8' x 20'
7. STORAGE: 30' x 30'
8. VEHICLE PARKING: 15' x 50'
9. POWER UNIT: 8' x 10'
10. DRILL PIPE: 30' x 30'
11. CRANE: 8' x 8'
12. DRILLING RIG: 8' x 45'
13. SURVEY TRAILER: 8' x 25'

NOTES:

1. EQUIPMENT ORIENTATION MAY VARY DEPENDING ON CONTRACTOR OR SITE CONDITIONS.
2. EQUIPMENT TO BE SUPPORTED ON THE GROUND SURFACE OR TIMBER MATS AS CONDITIONS DICTATE.
3. SILT FENCE, BERMS AND/OR STRAW BALE BARRIER TO BE USED AS REQUIRED TO PREVENT IMPACTS FROM OCCURRING OUTSIDE OF PROJECT LIMITS.
4. HAND CLEARED ACCESS PATH WILL BE USED TO OBTAIN WATER FROM SOURCE WHERE PERMITTED.

ENTRY SITE PLAN

SCALE: N.T.S.



PROFILE

SCALE: N.T.S.

GENERAL NOTES:

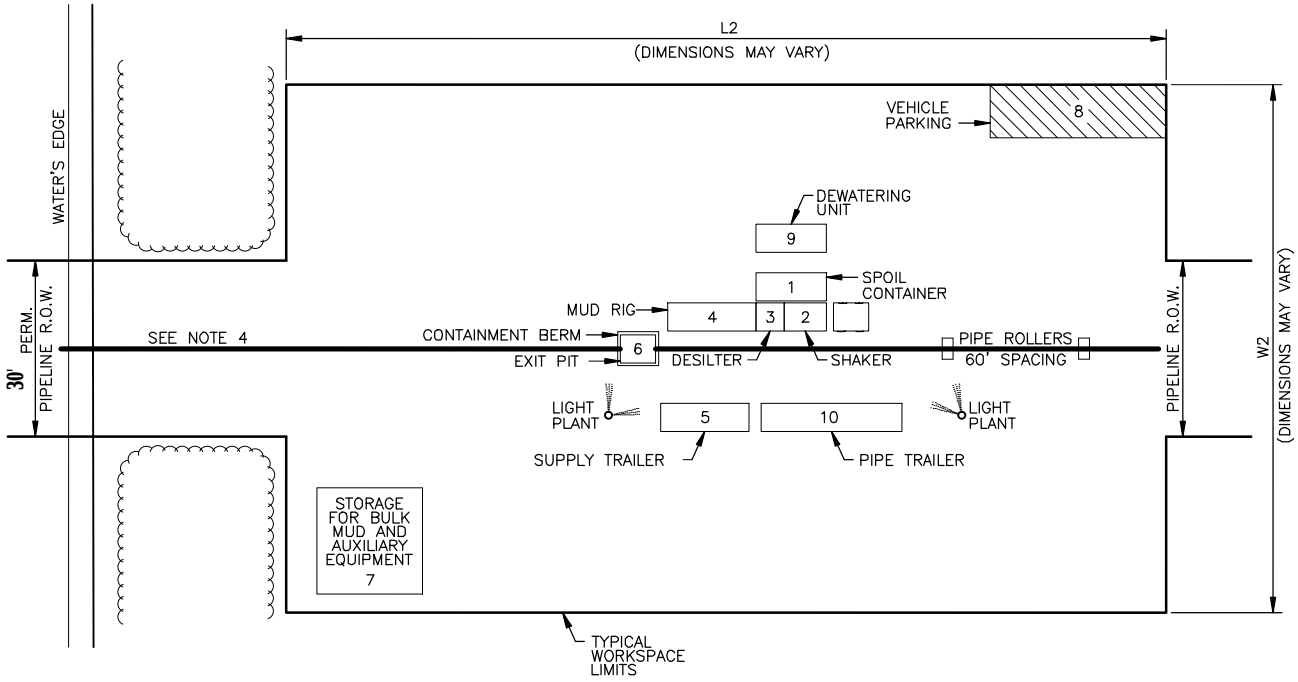
1.) PIPE DEPTHS MAY VARY.

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

MAINLINE CONSTRUCTION TYPICAL DIRECTIONAL DRILL ENTRY SITE PLAN & PROFILE

DRAWING NUMBER	SHEET
TYP-002	1 OF 1



EQUIPMENT:

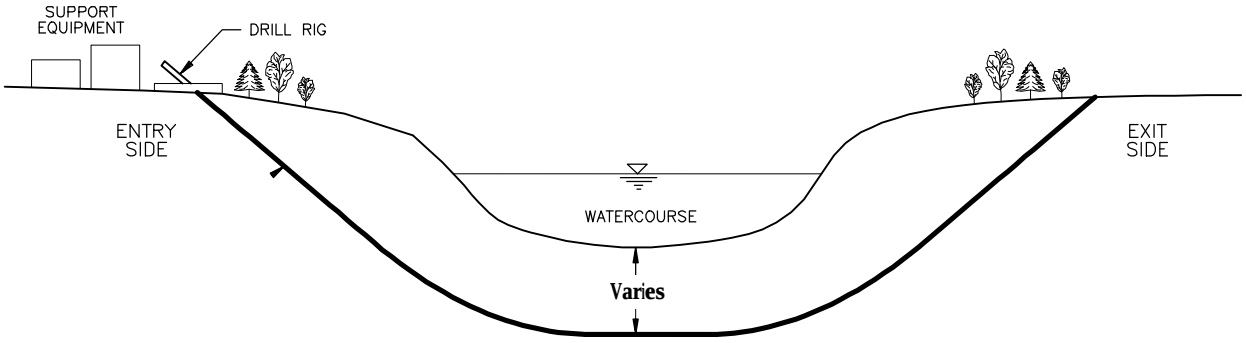
1. SPOIL CONTAINER: 8' x 20'
2. SHAKER: 8' x 12'
3. DESILTER: 8' x 8'
4. MUD RIG: 8' x 25'
5. SUPPLY TRAILER: 8' x 25'
6. EXIT PIT: 8' x 10'
7. STORAGE: 30' x 30'
8. VEHICLE PARKING: 15' x 50'
9. DEWATERING UNIT: 8' x 20'
10. PIPE TRAILER: 8' x 40'

NOTES:

1. EQUIPMENT ORIENTATION MAY VARY DEPENDING ON CONTRACTOR OR SITE CONDITIONS.
2. EQUIPMENT TO BE SUPPORTED ON THE GROUND SURFACE OR TIMBER MATS AS CONDITIONS DICTATE.
3. SILT FENCE, BERMS AND/OR STRAW BALE BARRIER TO BE USED AS REQUIRED TO PREVENT IMPACTS FROM OCCURRING OUTSIDE OF PROJECT LIMITS.
4. HAND CLEARED ACCESS PATH WILL BE USED TO OBTAIN WATER FROM SOURCE WHERE PERMITTED.

EXIT SITE PLAN

SCALE: N.T.S.



GENERAL NOTES

1.) PIPE DEPTHS MAY VARY.

PROFILE

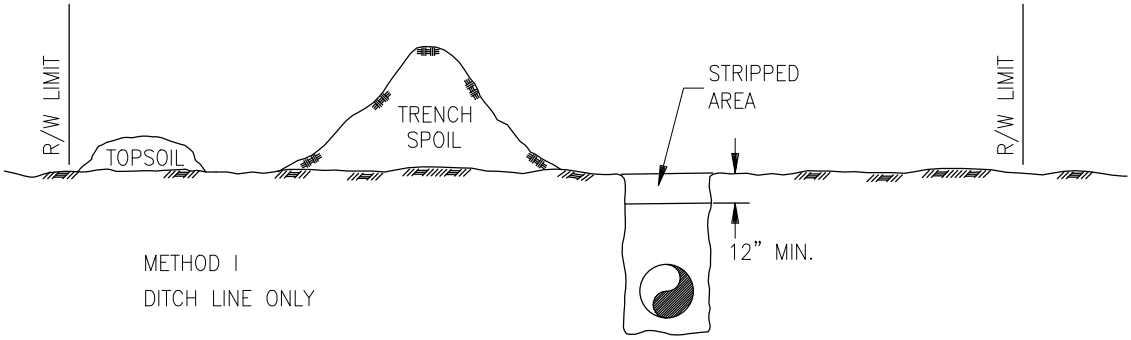
SCALE: N.T.S.

NO.	REVISION	DATE	APPR.

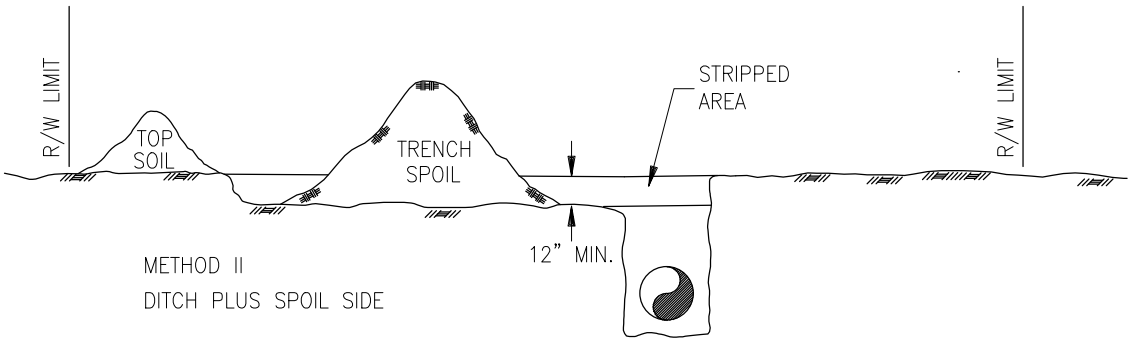
Blue Mountain Midstream

MAINLINE CONSTRUCTION TYPICAL DIRECTIONAL DRILL EXIT SITE PLAN & PROFILE

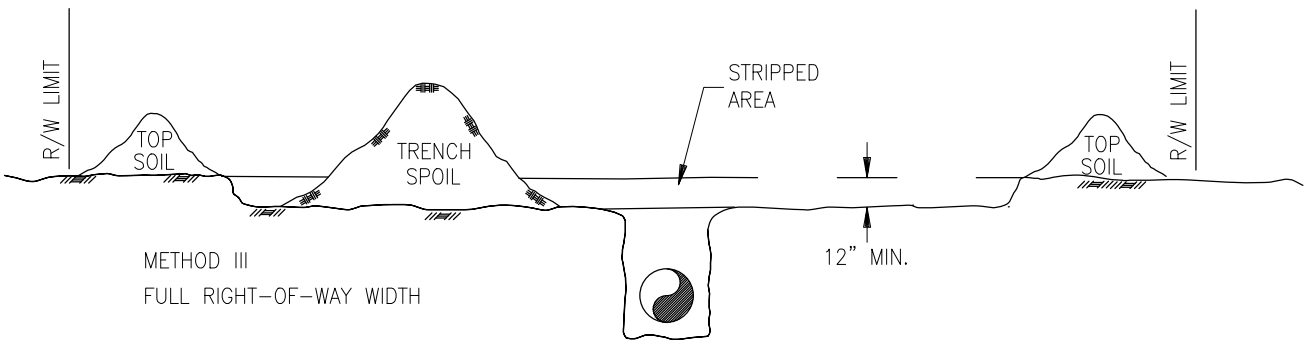
DRAWING NUMBER	SHEET
TYP-003	1 OF 1



METHOD I
DITCH LINE ONLY



METHOD II
DITCH PLUS SPOIL SIDE



METHOD III
FULL RIGHT-OF-WAY WIDTH

NOTES

1. STORE TOPSOIL ON ONE OR BOTH SIDES OF THE RIGHT-OF-WAY ADJACENT TO STRIPPED AREAS AS SHOWN ABOVE.

2. MAINTAIN A MINIMUM 3 FEET SEPARATION BETWEEN THE TOPSOIL AND THE TRENCH SPOIL PILES.

3. RETURN TOPSOIL EVENLY OVER STRIPPED AREA AFTER TRENCH BACKFILL HAS SUFFICIENTLY SETTLED OR HAS BEEN COMPACTED.

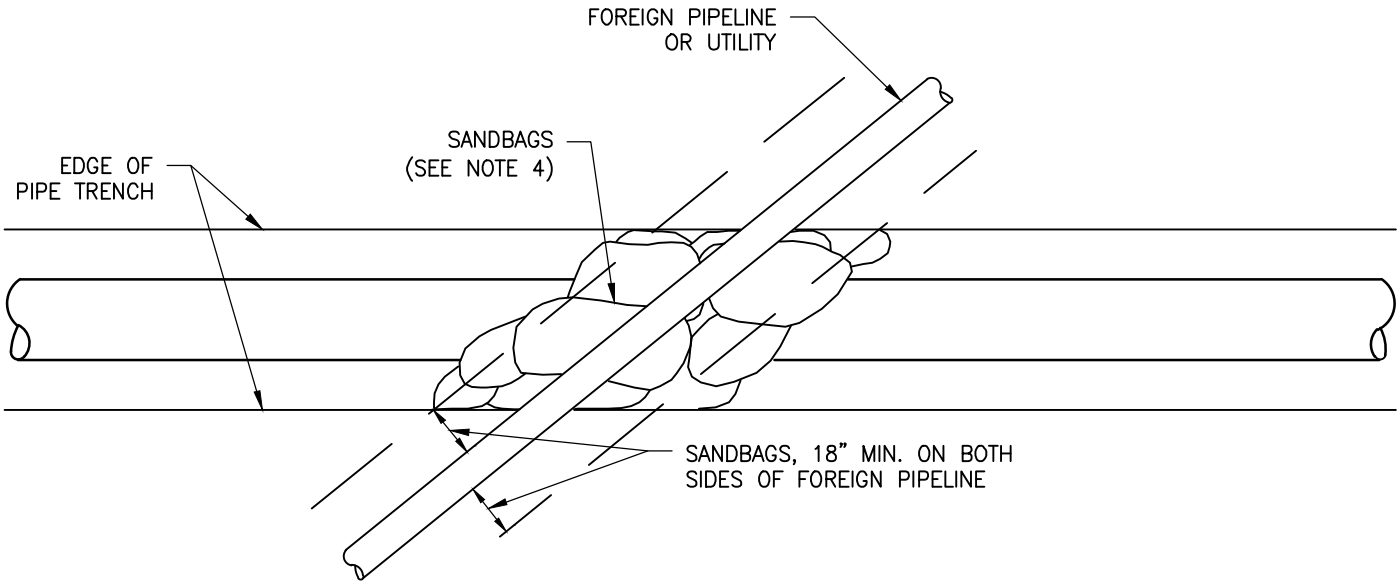
4. REMOVE ALL ROCKS GREATER THAN 4 INCHES IN DIAMETER FROM STRIPPED TOPSOIL.

NO.	REVISION	DATE	APPR.

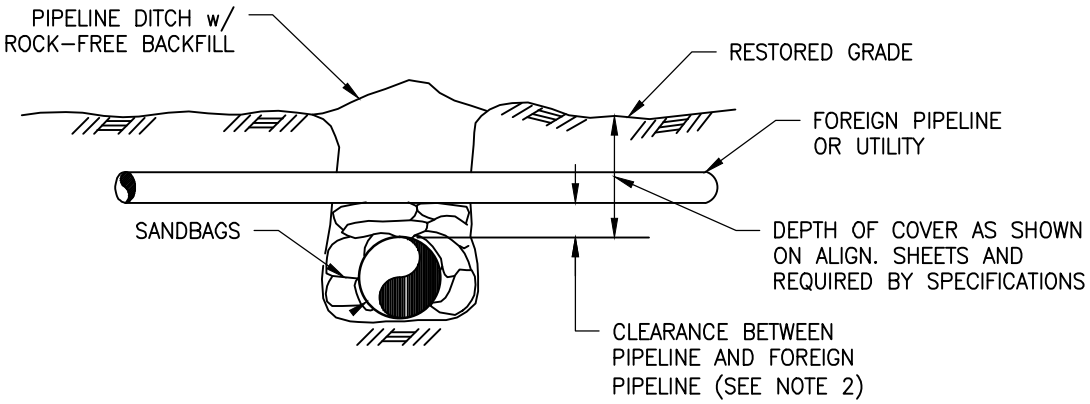
Blue Mountain Midstream

PIPELINE STANDARD TOPSOIL STRIPPING METHODS

SCALE	DATE	DRAWN	CHECKED	APPROVED	WEI PROJ. NO.	DRAWING NUMBER	SHEET
						TYP-004	1 OF 1



PLAN



END VIEW
CROSS SECTION

NOTES:

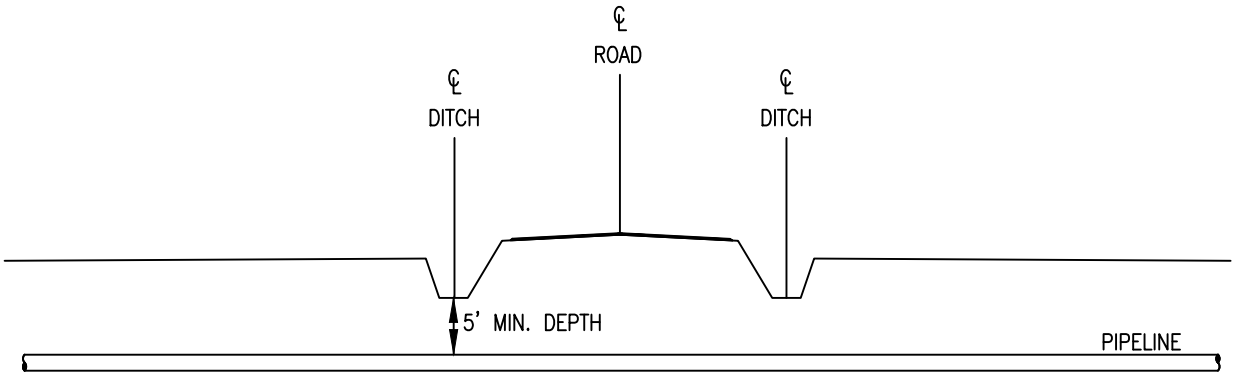
1. CATHODIC PROTECTION TEST STATION SHALL BE INSTALLED AT FOREIGN PIPELINE CROSSINGS, WHEN INDICATED ON THE ALIGNMENT SHEETS.
2. MAINTAIN 18" MINIMUM CLEARANCE WHEN CROSSING OVER OR UNDER FOREIGN PIPELINES.
3. SANDBAGS CONSIST OF BURLAP BAGS FILLED WITH EARTH THAT IS FREE OF SHARP ROCKS, TWIGS, AND OTHER OBJECTIONABLE MATERIALS (TOP SOIL SHALL NOT BE USED). USE OF SYNTHETIC MATERIALS FOR BAGS IS NOT ACCEPTABLE.

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

FOREIGN PIPELINE UTILITY CROSSING

DRAWING NUMBER	SHEET
TYP-005	1 OF 1

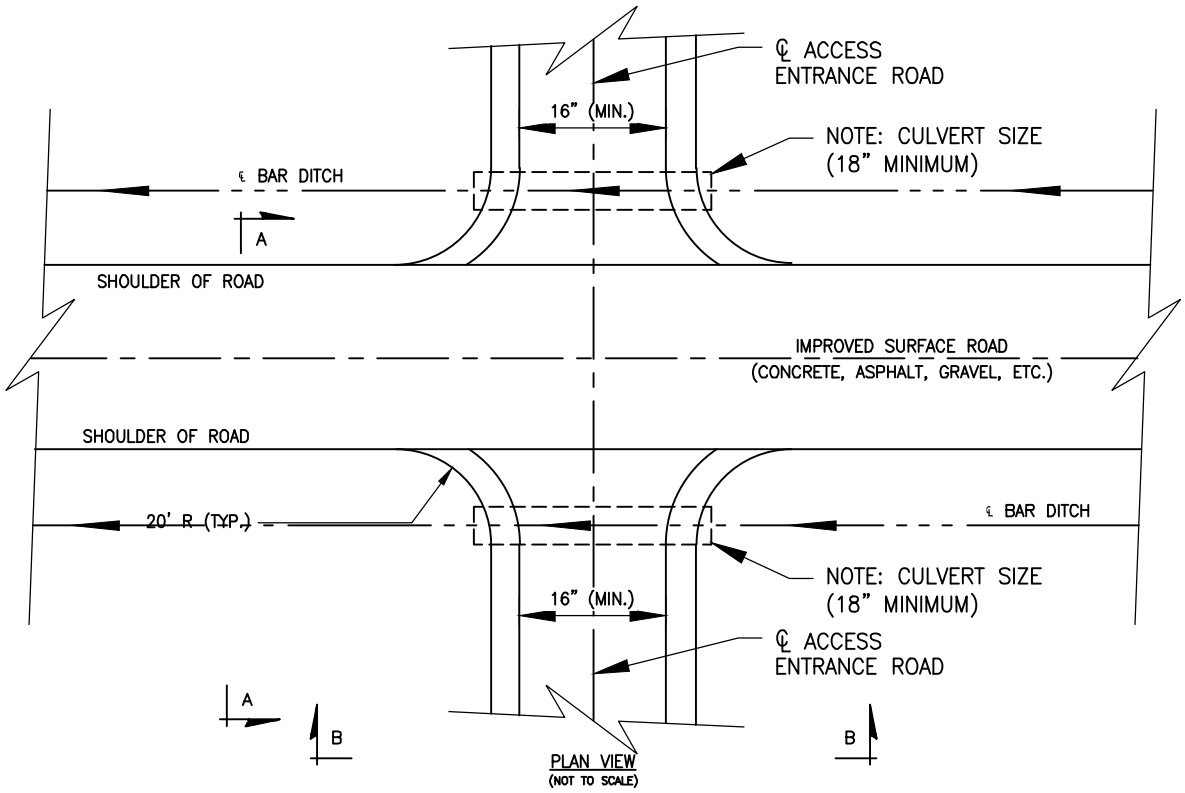


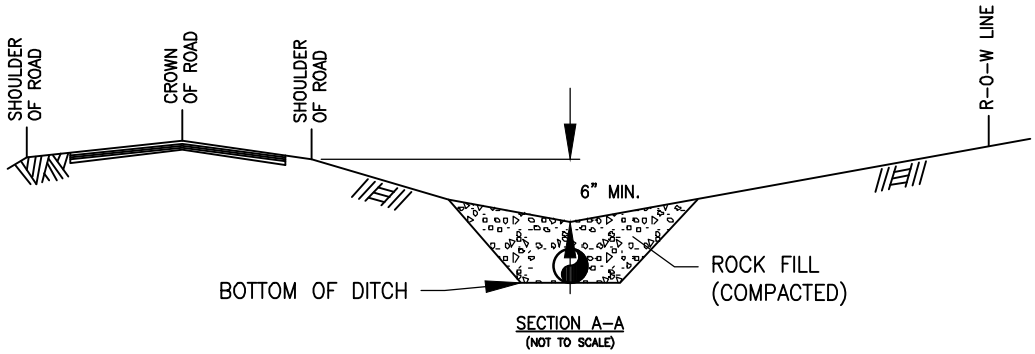
NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

TYPICAL ROAD BORE

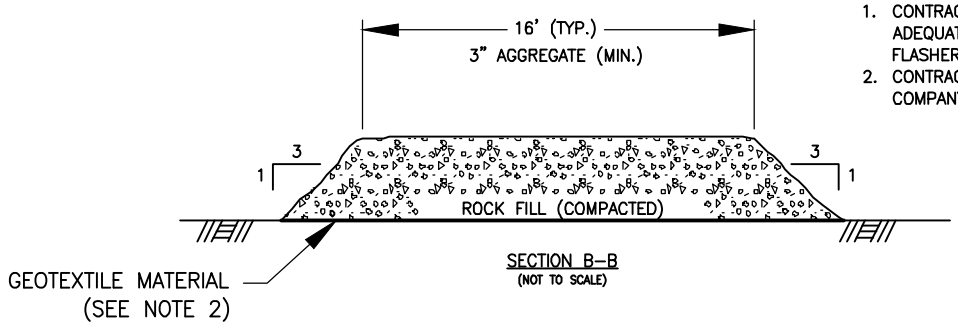
DRAWING NUMBER	SHEET
TYP-006	1 OF 1





NOTES:

1. CONTRACTOR SHALL FURNISH AND INSTALL ADEQUATE TRAFFIC CONTROL SIGNS, MARKERS, FLASHERS, ETC.
2. CONTRACTOR SHALL FURNISH AND INSTALL COMPANY APPROVED GEOTEXTILE MATERIAL.

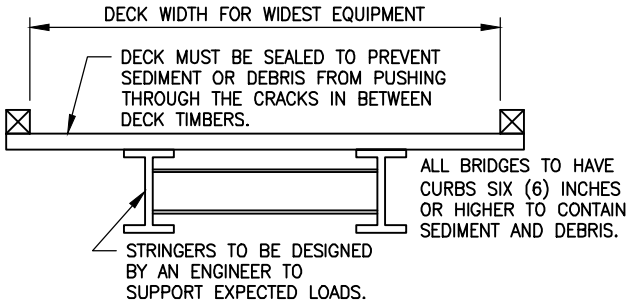


NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

TYPICAL PUBLIC ACCESS ROAD
ACCESS RAMP

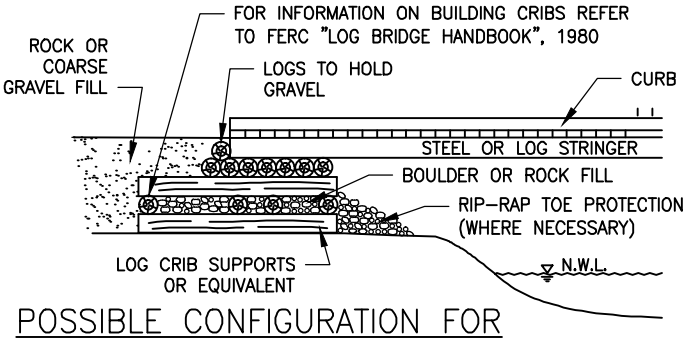
DRAWING NUMBER	SHEET
TYP-007	1 OF 1



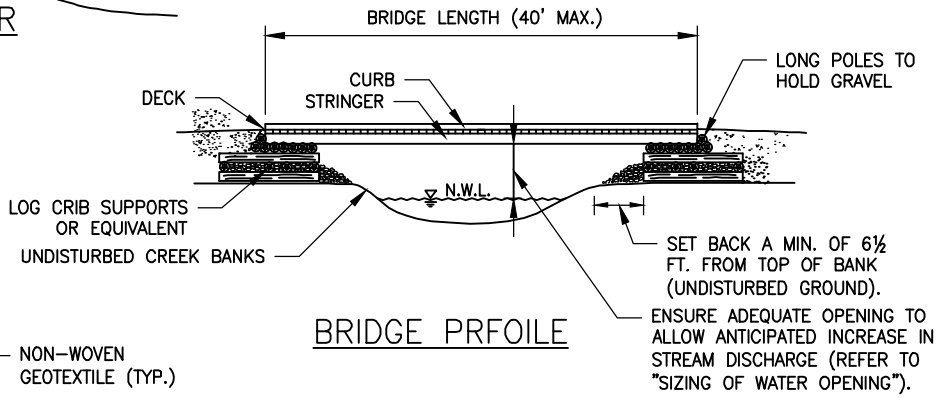
SECTION A–A

THE FOLLOWING IS A SEQUENCE OF CONSTRUCTION AND MITIGATION MEASURES TO BE FOLLOWED AT ALL TEMPORARY BRIDGE CROSSINGS.

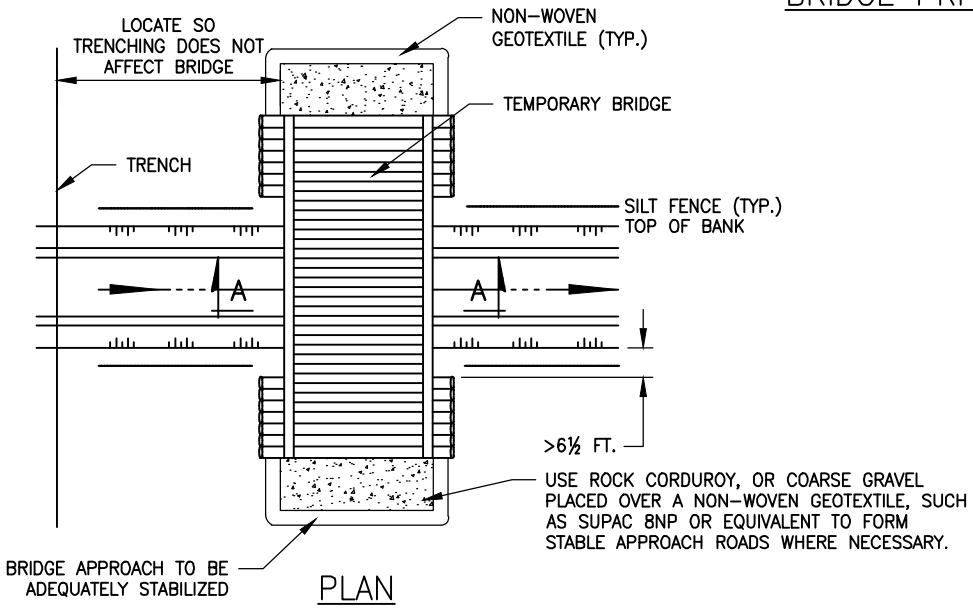
1. A PRE–FABRICATED BRIDGE OR FLATBED RAILCAR, FLEXI–FLOAT OR FLUMED VEHICLE CROSSING MAY BE SUBSTITUTED FOR THE TEMPORARY BRIDGE.
2. INSTALL THE BRIDGE IN A MANNER THAT WILL MINIMIZE SEDIMENT ENTERING THE WATER. STRINGERS MUST BE DESIGNED TO SUPPORT THE LOADS EXPECTED ON THE BRIDGE. CURBS AT LEAST SIX (6) INCHES HIGH MUST BE INSTALLED ALONG THE EDGE OF THE DECK TO CONTAIN SEDIMENT AND DEBRIS ON THE BRIDGE. FASTENERS CONNECTING COMPONENTS MUST BE STRONG ENOUGH TO HOLD THEM IN POSITION DURING THE LIFE OF THE BRIDGE. CRIBS MAY BE FILLED WITH ROCK OR COBBLE, OR MAY BE SOLID TIMBER ROTATED 90° IN ALTERNATIVE LAYERS. RIP–RAP EROSION PROTECTION IS TO BE PLACED AROUND THE CRIBS AND ON ANY FILL SLOPES PROJECTING INTO THE WATER.
3. ROAD APPROACHES LEADING TO THE BRIDGE MUST BE RAISED AND STABLE SO EQUIPMENT LOADS ARE SUPPORTED A SUFFICIENT DISTANCE BACK FROM THE WATER TO REDUCE SEDIMENT AND DEBRIS ENTERING THE STREAM FROM EQUIPMENT TRACKS. DO NOT USE SOIL TO CONSTRUCT OR STABILIZE EQUIPMENT BRIDGES. IF CUTS ARE NEEDED TO OBTAIN A SATISFACTORY GRADE, THEY ARE TO BE DUG WITH SIDE DITCHES AND STABLE SLOPES. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO KEEP SEDIMENT ON LAND (E.G., SILT FENCING, FILTER CLOTH, RIP–RAP, SEED AND MULCH, ETC.).
4. PERIODICALLY CHECK BRIDGE INSTALLATION AND REMOVE ANY BUILD–UP OF SEDIMENT OR DEBRIS ON THE BRIDGE.



POSSIBLE CONFIGURATION FOR TEMPORARY CRIB ABUTMENT



BRIDGE PRFOILE



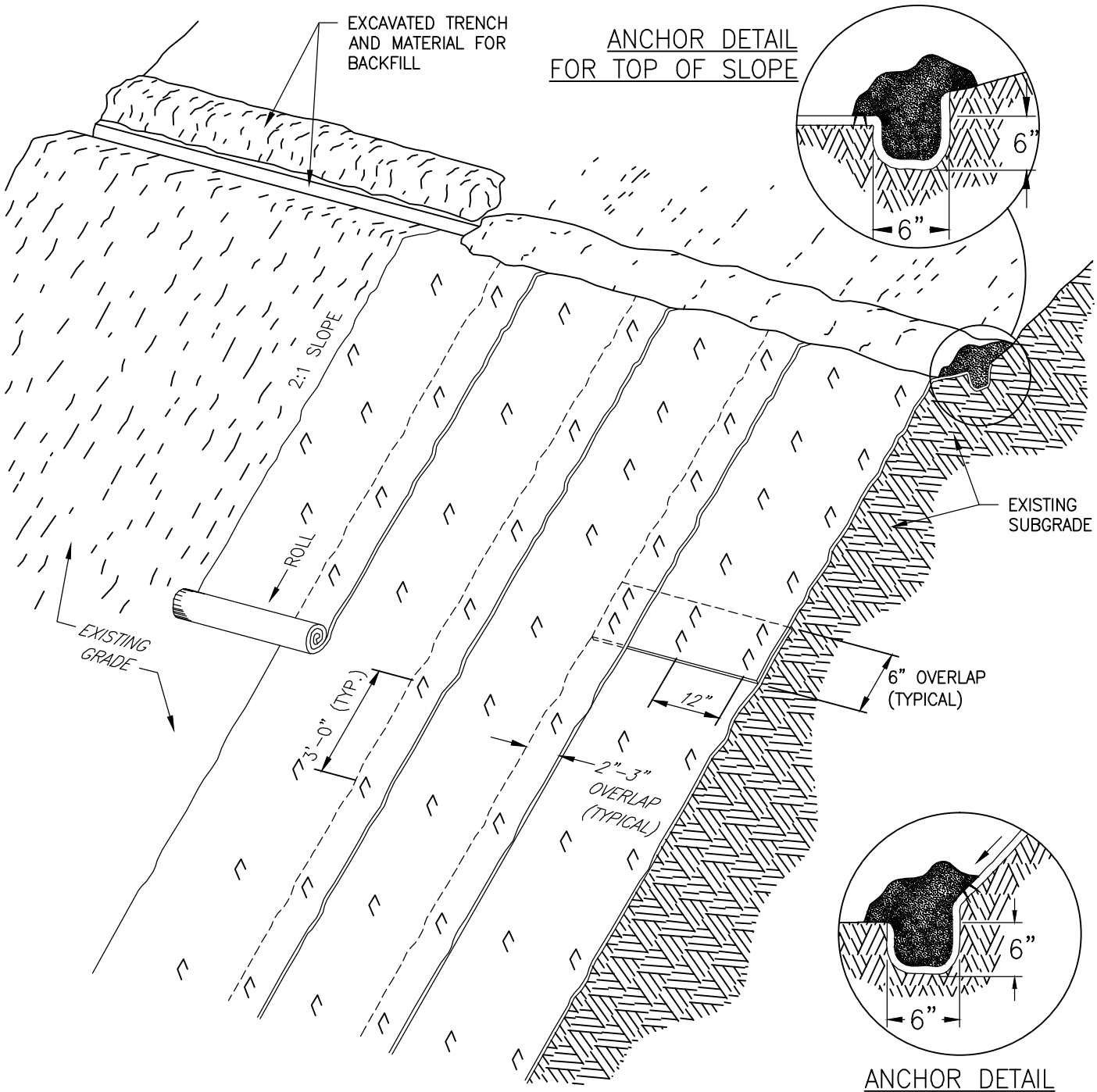
PLAN

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

TEMPORARY BRIDGE

DRAWING NUMBER	SHEET
TYP-008	1 OF 1



NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS; MAT/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL; DO NOT STRETCH MATERIAL.
3. STAPLES SHALL BE INSTALLED PER THE STAPLE LAYOUT DETAIL AND WITH STANDARD MAT STAPLES.
4. ON SLOPED AREAS MATTING SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.

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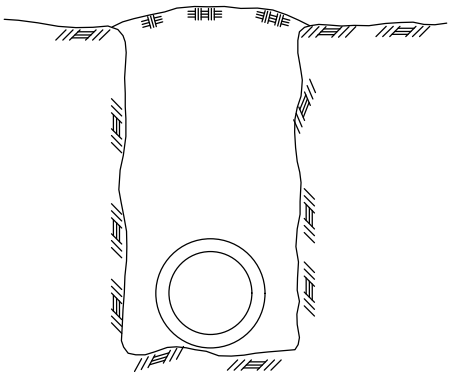
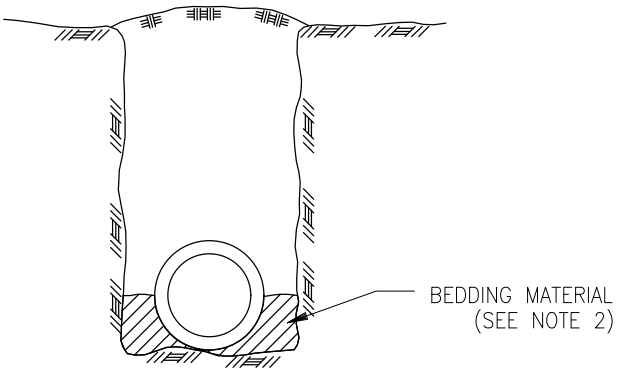
Blue Mountain Midstream

SHORELINE / BANK STABLIZATION

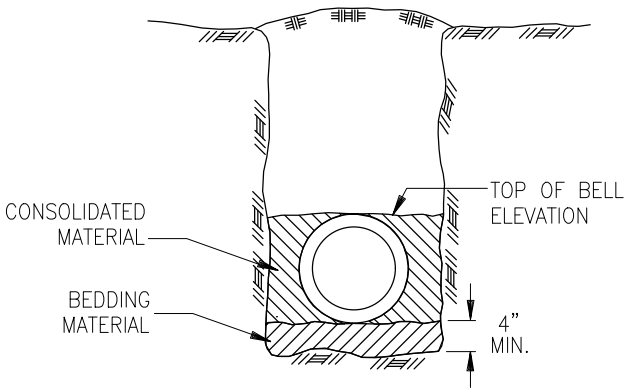
DRAWING NUMBER	SHEET
TYP-009	1 OF 1



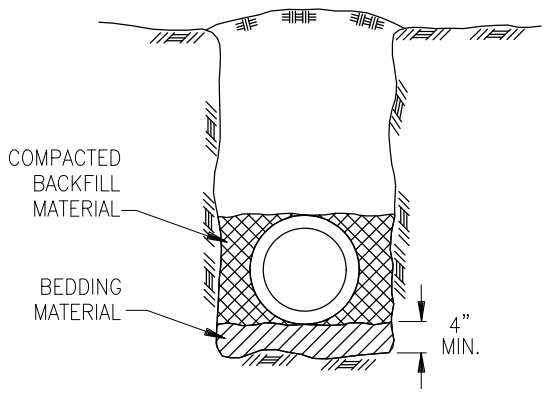
TYPE 1 TRENCH



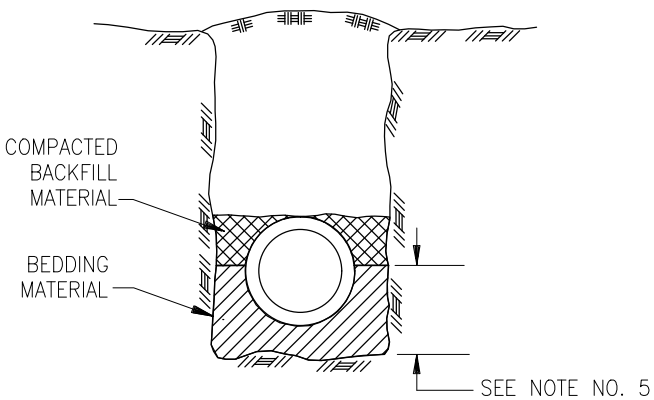
TYPE 2 TRENCH



TYPE 3 TRENCH
(SEE NOTE NO. 3)



TYPE 4 TRENCH
(SEE NOTE NO. 4)



TYPE 5 TRENCH
(SEE NOTE NO. 5)

NO.	REVISION	DATE	APPR.

SCALE	DATE	DRAWN	CHECKED	APPROVED	WEI PROJ. NO.	DRAWING NUMBER	SHEET
						TYP-010	1 OF 2

Blue Mountain Midstream

TRENCH AND BACKFILL
TYPE DETAILS

NOTES:

1. FOR A TYPE 1, THE PIPE SHALL BE INSTALLED DIRECTLY ON THE UNDISTURBED EARTH AT THE BOTTOM OF THE TRENCH AND BACKFILLED PER THE SPECIFICATIONS.

2. FOR A TYPE 2, THE TRENCH IS IDENTICAL TO A TYPE 1 EXCEPT THAT THE DEPTH FROM THE BOTTOM OF THE TRENCH TO THE CENTERLINE OF THE DUCTILE IRON PIPE IS BACKFILLED WITH LIGHTLY CONSOLIDATED EXCAVATION MATERIAL.

3. FOR TYPE 3, THE TRENCH SHALL HAVE A 4 INCH MINIMUM PIPE BEDDING MATERIAL INSTALLED. THE BEDDING MATERIAL SHALL BE LOOSE SOIL OR SELECT MATERIAL. LOOSE SOIL OR SELECT MATERIAL IS DEFINED AS SAND OR NATIVE SOIL EXCAVATED FROM THE TRENCH FREE OF ROCKS, FOREIGN MATERIAL AND FROZEN MATERIAL. FROM PIPE BEDDING ELEVATION TO THE TOP OF THE PIPE ELEVATION, THE BACKFILL MATERIAL SHALL BE LIGHTLY CONSOLIDATED MATERIAL.

4. FOR TYPE 4, THE TRENCH SHALL HAVE A MINIMUM DEPTH EQUAL TO WHICHEVER IS THE GREATER DEPTH OF 4 INCHES PIPE BEDDING OR ⅛ OF THE PIPE DIAMETER AND SHALL BE COMPOSED OF SAND, GRAVEL OR CRUSHED ROCK. FROM THE PIPE BEDDING ELEVATION TO THE TOP OF PIPE ELEVATION THE BACKFILL SHALL BE COMPACTED IN 6–INCH MAXIMUM LIFTS TO 80 PERCENT MODIFIED PROCTOR AS DETERMINED BY ASTM D698.

5. FOR TYPE 5, THE TRENCH SHALL HAVE THE PIPE BEDDING MATERIAL A MINIMUM OF 4 INCHES UNDER THE PIPE UP TO THE CENTERLINE OF THE PIPE. THE PIPE BEDDING MATERIAL SHALL BE COMPACTED AND SHALL BE COMPOSED OF GRANULAR MATERIAL. FROM THE TOP OF THE PADDING MATERIAL TO THE TOP OF THE PIPE, THE BACKFILL SHALL BE COMPACTED AND COMPOSED OF GRANULAR OR SELECT MATERIAL. THE PADDING MATERIAL AND THE BACKFILL MATERIAL TO THE TOP OF THE PIPE SHALL BE COMPACTED IN 6–INCH MAXIMUM LIFTS TO 90 PERCENT MODIFIED PROCTOR AS DETERMINED BY ASTM D698.

6. ALL OF THE BACKFILL FOR TYPE 1, FROM CENTERLINE OF PIPE FOR TYPE 2 AND FROM THE TOP OF PIPE ELEVATION FOR TYPE 3, 4, AND 5, TO GRADE ELEVATION THE BACKFILL SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

7. FOR ALL TRENCH TYPES, THE BODY OF THE DUCTILE IRON PIPE SHALL BE COMPLETELY SUPPORTED BY THE BODY OF THE PIPE. THE BELL PORTION SHALL NOT SUPPORT THE PIPE WEIGHT DURING INSTAL–LATION WHICH WILL REQUIRE HAND EXCAVATION AT THE BELL END AREAS.

8. FOR TYPES 1 AND 2, THE MINIMUM WIDTH OF THE TRENCH IS O.D. PLUS 12 INCHES. FOR TYPES 3, 4 AND 5, THE MINIMUM WIDTH OF THE TRENCH IS O.D. PLUS 24 INCHES WITH THE PIPE BEING CENTERED IN THE TRENCH AS MUCH AS IS PRACTICAL.

9. THE TRENCH WALLS ABOVE THE TOP OF PIPE ELEVATION SHALL BE SHORED OR SLOPED FOR STABILITY AS REQUIRED TO PROVIDE A SAFE WORK ENVIRONMENT.

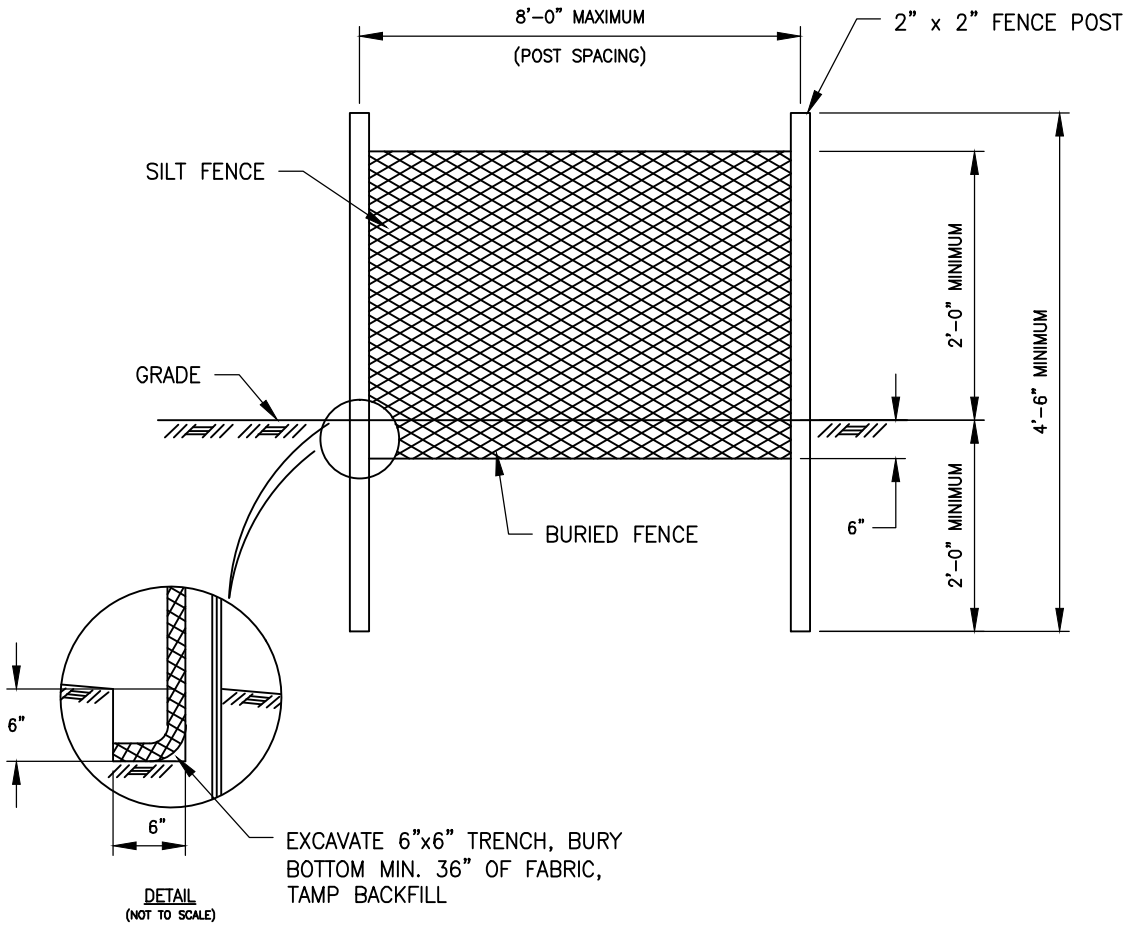
10. MINIMUM COVER IS 4'–0". THIS REQUIRED DEPTH IS MEASURED FROM THE TOP OF BELL JOINT AREA AND WHEN APPLICABLE FROM THE TOP OF CONCRETE WEIGHT OR THE REQUIRED RIP–RAP HEIGHT PER STANDARD DRAWING STD–A–010 TO THE TOP OF ORIGINAL GRADE.

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

TRENCH AND BACKFILL TYPE DETAILS

SCALE	DATE	DRAWN	CHECKED	APPROVED	WEI PROJ. NO.	DRAWING NUMBER	SHEET
						TYP-010A	2 OF 2



NOTES:

1. SILT FENCES ARE CONSTRUCTED FROM SYNTHETIC MESH MATERIAL DESIGNED TO RETAIN SILT WHILE ALLOWING WATER TO PASS THROUGH (EXXON GTF 180, MIRAFI 600X OR APPROVED EQUAL).

2. SILT FENCES WILL BE CONSTRUCTED AT THE EDGE OF THE RIGHT–OF–WAY:
   - AT THE OUTFALL OF AN INTERCEPTOR DIKE IF NATURAL VEGETATION IS INSUFFICIENT TO FILTER THE SILT FROM THE RUN–OFF WATER.
   - AT THE BASE OF SLOPES ADJACENT TO ROADWAYS AND STREAMS WHEN THE NATIVE VEGETATION COVER HAS BEEN DISTURBED.
   - WHEN THE DISTANCE (IN AREAS OF GOOD VEGETATION COVER) OF THE RIGHT–OF–WAY TO A BODY OF WATER IS EQUAL TO OR LESS THAN THE FOLLOWING SCHEDULE.

PERCENT	SLOPE DISTANCE
0 – 5%	25 FEET
5 – 15%	50 FEET
15 – 30%	75 FEET
OVER 30%	100 FEET

   - WHEN THE DISTANCE (IN AREAS OF POOR VEGETATION COVER) OF THE RIGHT–OF–WAY TO A BODY OF WATER IS WITHIN 150 FEET AND THE AREA SLOPES TOWARD THE WATER.

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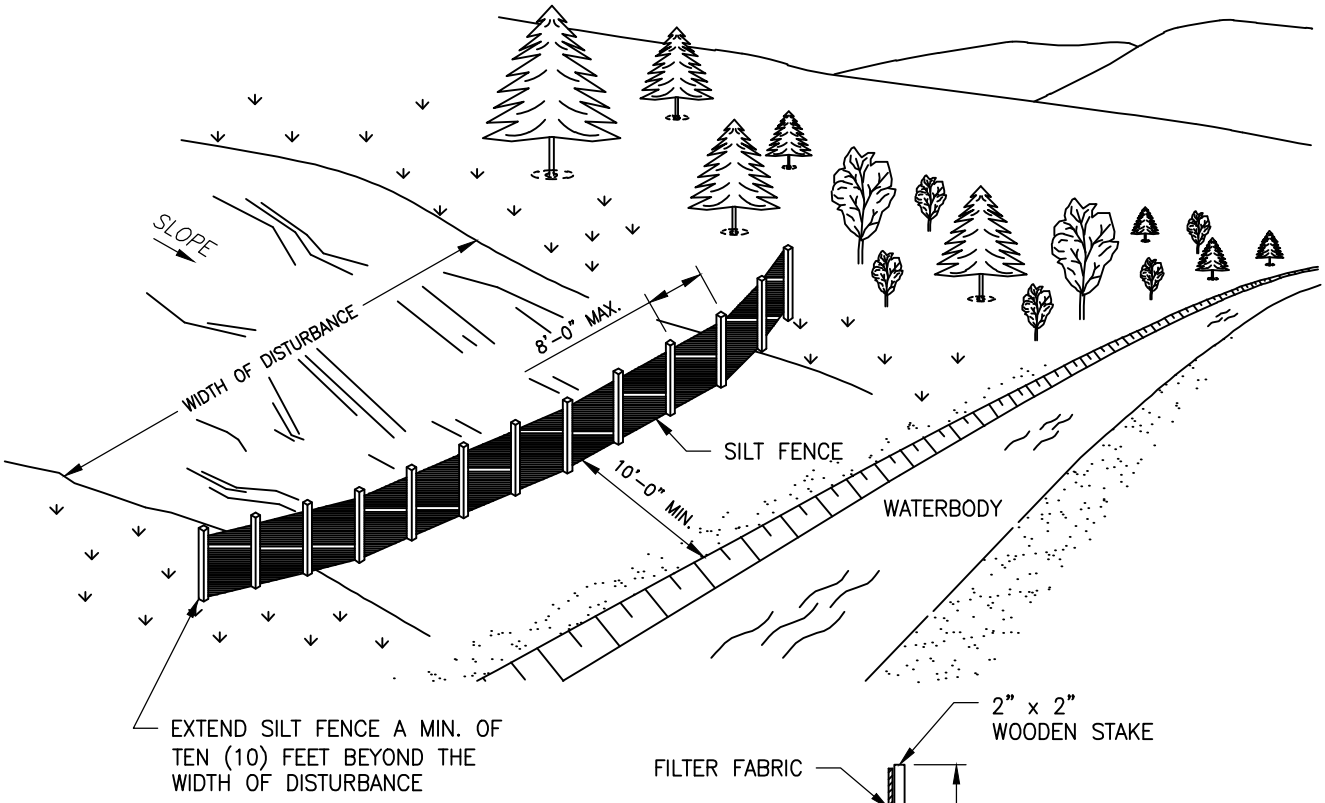
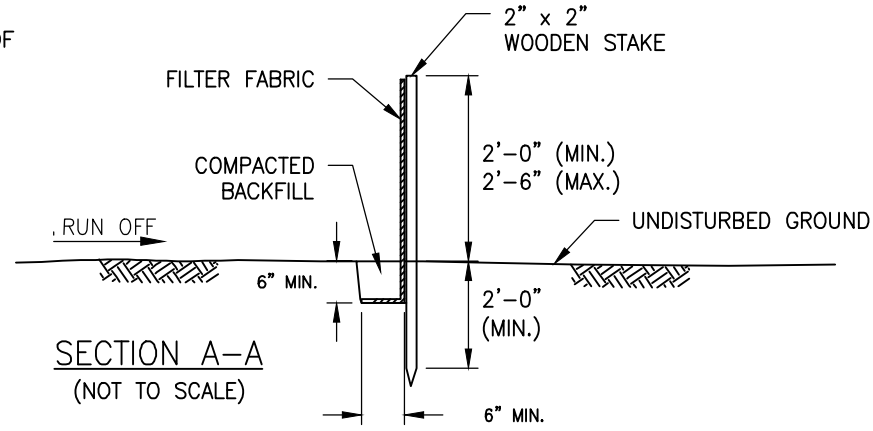
EROSION CONTROL
SILT FENCE

DRAWING NUMBER	SHEET
TYP-011	1 OF 1





SECTION A-A
(NOT TO SCALE)

NOTES:

1. SILT FENCES ARE TO BE USED IN AREAS WHERE SHEET FLOW OR RELATIVELY SMALL VOLUMES OF WATER CAN BE EXPECTED TO OCCUR. FOR LARGER VOLUMES SUCH AS WITHIN A DEFINED CHANNEL, A CHECK DAM WILL BE REQUIRED.
2. STAKES ARE TO BE PLACED EVERY TEN (8) FEET OR CLOSER AS CONDITIONS REQUIRE.
3. ATTACH FILTER FABRIC AT EACH POST AT A MINIMUM OF THREE (3) LOCATIONS.
4. THE FILTER FABRIC (MIN. OF 36") IS TO BE ANCHORED IN A SIX (6) INCH x SIX (6) INCH TRENCH WITH WELL COMPACTED BACKFILL OVER THE FABRIC TO PREVENT UNDERMINING.
5. TO ELIMINATE POSSIBLE END FLOW, BOTH ENDS OF THE SILT FENCE SHALL BE TURNED AND EXTENDED UPSLOPE.
6. SILT FENCES ARE TO BE CHECKED AND MAINTAINED ON A REGULAR BASIS. REMOVE ANY BUILD-UP OF SEDIMENT WHEN THE HEIGHT OF SEDIMENT EXCEEDS APPROXIMATELY 20% OF THE HEIGHT OF THE BARRIER.
7. MATERIAL SHOULD BE WOVEN GEOTEXTILE FABRIC SUCH AS EXXON GTF 180 OR MIRAFI 600X, OR AN APPROVED EQUIVALENT. SECONDARY REINFORCEMENT, SUCH AS A CONSTRUCTION BARRIER FENCE OR WIRE MESH CAN ALSO BE USED BEHIND THE FILTER FABRIC.
8. WHERE ANCHORING CONDITIONS FOR THE SILT FENCE ARE POOR, PLACE ANCHORED STRAW BALES ON DOWNSTREAM SIDE OF THE SILT FENCE.

NO.	REVISION	DATE	APPR.

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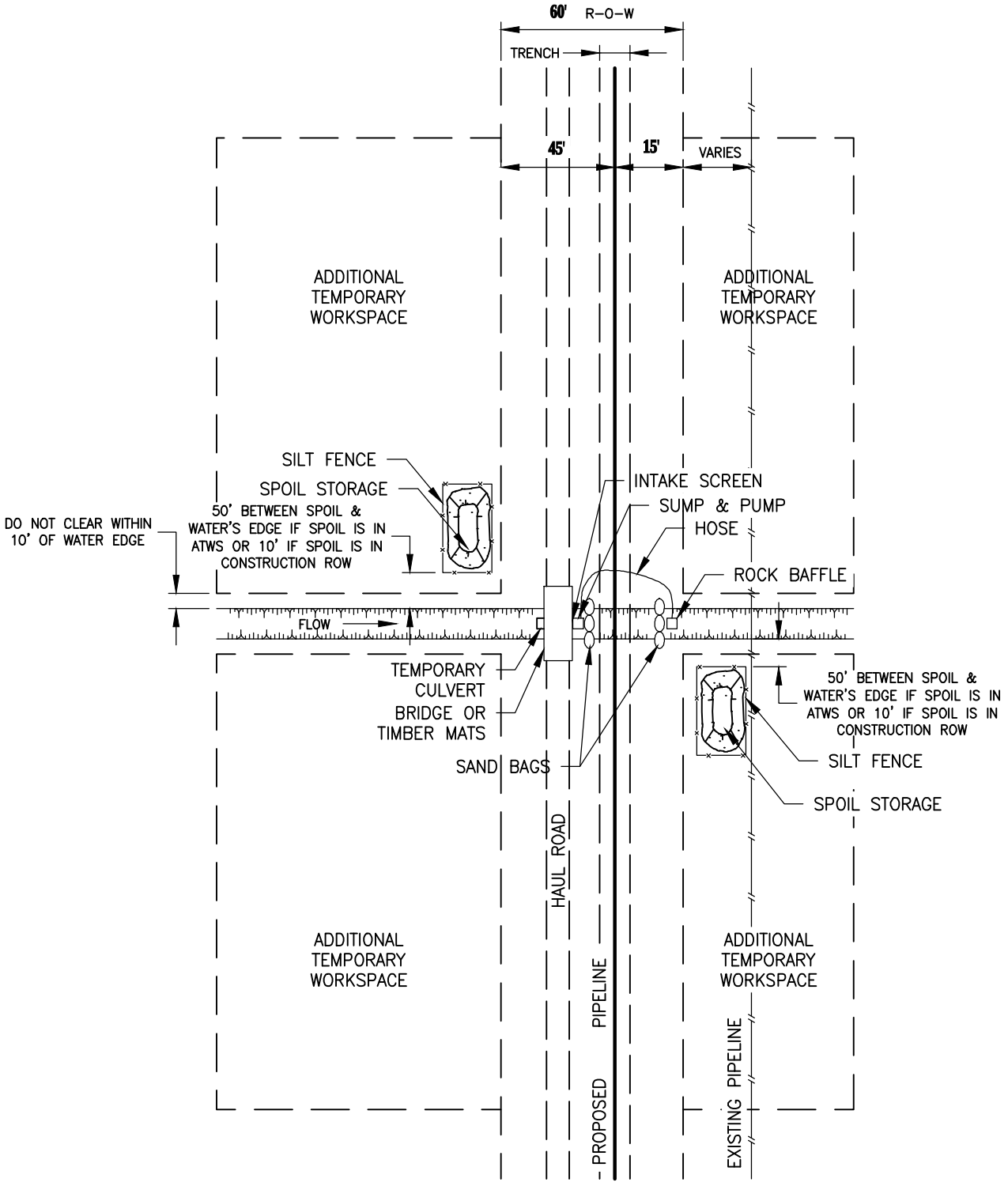
EROSION CONTROL
SILT FENCE BARRIER

DRAWING NUMBER	SHEET
TYP-012	1 OF 1



REFER TO SHEET 2 OF 2

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

EROSION CONTROL DAM AND PUMP

DRAWING NUMBER	SHEET
TYP-013	1 OF 2

DAM AND PUMP CROSSING

THE FOLLOWING IS A SEQUENCE OF CONSTRUCTION AND MITIGATION MEASURES TO BE FOLLOWED AT ALL "DAM AND PUMP" TYPE CROSSINGS.

SEQUENCE OF ACTIVITIES

STEP 1. CLEAR AND GRADE RIGHT-OF-WAY AS NECESSARY.
STEP 2. IMPLEMENT THE TEMPORARY EROSION AND SEDIMENT CONTROLS.
STEP 3. FABRICATE PIPE.
STEP 4. INSTALL DRY STREAM CROSSING MATERIALS.
STEP 5. EXCAVATE TRENCH AND INSTALL PIPE.
STEP 6. BACKFILL AND RESTORE STREAM BANKS.
STEP 7. REMOVE DAMS.
STEP 8. IMPLEMENT THE PERMANENT EROSION & SEDIMENTATION CONTROLS.

MAINTENANCE OF STREAMFLOW

IF THERE IS ANY FLOW IN THE WATERCOURSE, INSTALL PUMPS TO MAINTAIN STREAM FLOW AROUND THE BLOCKED OFF SECTIONS OF CHANNEL. THE PUMP IS TO HAVE 1.5 TO 2 TIMES THE PUMPING CAPACITY OF ANTICIPATED FLOW. A SECOND STANDBY PUMP OF EQUAL CAPACITY IS TO BE READILY AVAILABLE AT ALL TIMES. AN ENERGY DISSIPATER IS TO BE BUILT TO ACCEPT PUMP DISCHARGE WITHOUT STREAM BED OR STREAM BANK EROSION. IF THE CROSSING IS PROLONGED BEYOND ONE (1) DAY THE OPERATION NEEDS TO BE MONITORED OVERNIGHT.

NOTES:

1. WHERE NECESSARY, OBTAIN PRIOR APPROVAL BEFORE USING THE DAM AND PUMP METHOD.
2. SCHEDULE INSTREAM ACTIVITY FOR LOW FLOW PERIODS AND FOR THE APPROPRIATE TIMING WINDOW.
3. MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURES NEEDED TO PROTECT WATER QUALITY. INSTALL PRE-WORK SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE PLAN. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE DAMS AND TO PUMP WATER MUST BE ON SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER CONSTRUCTION. PIPE SHOULD BE STRUNG, WELDED AND COATED AND READY FOR INSTALLATION PRIOR TO WATERCOURSE TRENCHING.
4. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED OR ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS STREAM.
   a. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY OR INDIRECTLY INTO THE STREAM.
   b. EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS.
   c. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION. UTILIZE STRAW BALE BARRIERS ONLY IN LIEU OF A SILT FENCE WHERE FREQUENT ACCESS IS REQUIRED.
   d. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA, INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG.
   e. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED PORTIONS OF THE RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
   f. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
5. TO THE EXTENT POSSIBLE, MAINTAIN A MINIMUM 50 FEET ON FEDERAL LAND AND 10 FEET ON PRIVATE LAND. VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SILT FENCE UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE. THE SILT FENCE SHOULD INCORPORATE REMOVABLE "GATES" AS REQUIRED TO ALLOW ACCESS WHILE MAINTAINING EASE OF REPLACEMENT FOR OVERNIGHT OR DURING PERIODS OF RAINFALL.
6. CONSTRUCT A TEMPORARY SUMP UPSTREAM OF THE DAM AND LINE WITH ROCKFILL IF A NATURAL POOL DOES NOT EXIST. INSTALL THE PUMP OR PUMP INTAKE IN THE POOL OR SUMP. DISCHARGE WATER ONTO AN ENERGY DISSIPATER DOWNSTREAM OF THE WORK AREA.
7. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 50 FEET ON FEDERAL LAND AND 10 FEET ON PRIVATE LAND OF THE WATERCOURSE. THIS MATERIAL MUST BE CONTAINED WITHIN BERM CONTAINMENT, WITH SECONDARY SILT FENCE PROTECTION TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE.
8. CHEMICALS, FUELS, LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT REFUELED WITHIN 500 FEET OF THE WATERBODY. PUMPS ARE TO BE REFUELED AS PER THE SPCC PLANS.
9. STAGING AREAS ARE TO BE LOCATED AT LEAST 50 FEET FROM THE WATER'S EDGE ON FEDERAL LAND AND 10 FEET ON PRIVATE LAND (WHERE TOPOGRAPHIC CONDITIONS PERMIT) AND SHALL BE THE MINIMUM SIZE NEEDED.
10. DAMS ARE TO BE MADE OF STEEL PLATE, INFLATABLE PLASTIC DAM, SAND BAGS, COBBLES, WELL GRADED COARSE GRAVEL FILL, OR ROCK FILL. DAMS MAY NEED KEYING INTO THE BANKS AND STREAM BED. ENSURE THAT THE DAM AND VEHICLE CROSSING ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION. CAP FLUMES USED UNDER VEHICLE CROSSING DURING DRY CROSSING.
11. DEWATER AREA BETWEEN DAMS IF POSSIBLE. DEWATERING SHOULD OCCUR IN A STABLE VEGETATIVE AREA A MINIMUM OF 50 FT. FROM ANY WATERBODY. THE PUMP DISCHARGE SHOULD BE DISCHARGED ONTO A STABLE SPILL PAD CONSTRUCTED OF ROCKFILL SANDBAGS, OR TIMBERS TO PREVENT LOCALIZED EROSION. THE DISCHARGE WATER SHOULD ALSO BE FORCED INTO SHEET FLOW IMMEDIATELY BEYOND THE SPILL PAD BY USING STRAW BALES AND THE NATURAL TOPOGRAPHY. IF IT IS NOT POSSIBLE TO DEWATER THE EXCAVATION DUE TO SOILS WITH A HIGH HYDRAULIC CONDUCTIVITY, THE EXCAVATION AND PIPE PLACEMENT IS TO BE CARRIED OUT IN THE STANDING WATER. PUMP ANY DISPLACED WATER AS DESCRIBED ABOVE TO PREVENT OVERTOPPING OF DAMS.
12. EXCAVATE TRENCH THROUGH PLUGS AND STREAM BED FROM BOTH SIDES, RE-POSITIONING DISCHARGE HOSE AS NECESSARY. LOWER THE PIPE IN THE TRENCH AND BACKFILL IMMEDIATELY. DURING THIS OPERATION WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE.
13. CONTRACTOR SHALL RESTORE THE STREAM BED AND BANKS TO PRE-CONSTRUCTION CONTOURS, BUT NOT TO EXCEED TWO (2) HORIZONTAL TO ONE (1) VERTICAL.
   a. CONTRACTOR SHALL INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED ON A SITE SPECIFIC BASIS.
   b. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING.
   c. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATER COURSE UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.
14. WHEN THE STREAM BED HAS BEEN RESTORED, THE CREEK BANKS ARE TO BE CONTOURED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH FLOW VELOCITY BETWEEN DAMS (E.G., EROSION CONTROL BLANKETS, CRIBBING, ROCK RIP-RAP, ETC.). THE DAMS ARE TO BE REMOVED DOWNSTREAM FIRST. KEEP PUMP RUNNING UNTIL NORMAL FLOW IS RESUMED. COMPLETE BANK TRIMMING AND EROSION PROTECTION. IF SANDBAGS ARE USED FOR THE DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS.

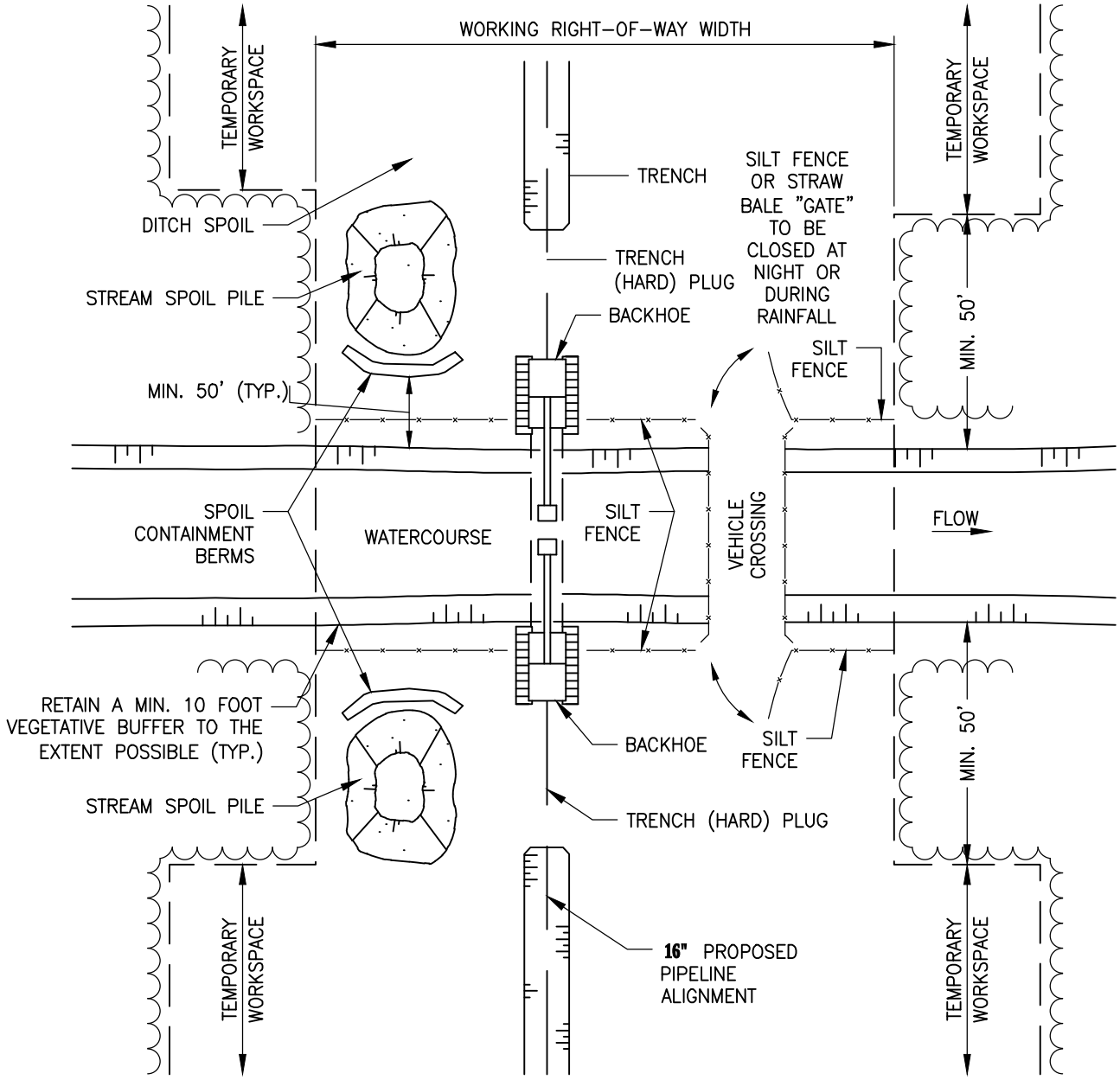
REFER TO SHEET 1 OF 2

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

EROSION CONTROL
DAM AND PUMP
(NOTES)

DRAWING NUMBER	SHEET
TYP-013A	2 OF 2



PLAN VIEW
(NOT TO SCALE)

SEQUENCE OF ACTIVITIES:

STEP 1. CLEAR AND GRADE.
STEP 2. IMPLEMENT THE TEMPORARY EROSION AND SEDIMENT CONTROLS.
STEP 3. FABRICATE PIPE.
STEP 4. EXCAVATE TRENCH AND INSTALL PIPE.
STEP 5. BACKFILL AND RESTORE STREAM BANKS.
STEP 6. IMPLEMENT THE PERMANENT EROSION AND SEDIMENT CONTROLS.

REFER TO SHEET 2 OF 2

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

OPEN CUT WATERBODY CROSSING

DRAWING NUMBER	SHEET
TYP-014	1 OF 2

NOTES:

1. WORK SPACE – LIMITS ARE DEPICTED. STAGING FOR MAKEUP LOCATED A MINIMUM OF FIFTY (50) FEET ON FEDERAL LAND AND TEN (10) FEET ON PRIVATE LAND FROM WATERBODY.

2. CLEARING – MARK CLEARING LIMITS AND MINIMIZE CLEARING OF RIPARIAN VEGETATION. WOODY VEGETATION SHALL BE CUT AT GROUND LEVEL AND THE STUMPS/ROOTS LEFT IN PLACE TO THE EXTENT POSSIBLE.

3. SPILL PREVENTION – CONTRACTOR SHALL INSTALL SIGNS 100 FEET MINIMUM FROM EACH STREAM BANK AND WETLAND TO IDENTIFY THE HAZARDOUS MATERIALS EXCLUSION AREA.

4. EROSION AND SEDIMENT CONTROL
   A. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED OR ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS STREAM OR WETLAND.
   B. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY OR INDIRECTLY INTO THE STREAM. ALL EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO SUIT ACTUAL SITE CONDITIONS. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION.
   C. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA, INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED CONSTRUCTION RIGHT OF WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
   D. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED.
   E. TRENCH BREAKERS ARE TO BE INSTALLED AT THE SAME SPACING AND IMMEDIATELY UPSLOPE OF PERMANENT SLOPE BREAKERS, OR AS DIRECTED BY THE COMPANY.

5. INSTALLATION – CONTRACTOR SHALL MAINTAIN HARD PLUGS IN THE DITCH AT THE RIVER EDGE UNTIL JUST PRIOR TO PIPE INSTALLATION. CONTRACTOR SHALL EXCAVATE TRENCH AND INSTALL PIPE AS EXPEDIENTLY AS PRACTICAL TO REDUCE THE DURATION OF WORK ACTIVITIES IN THE STREAM BED.

6. SPOIL PLACEMENT – CONTRACTOR SHALL PLACE TRENCH SPOIL ONLY IN APPROVED WORK SPACES AND A MINIMUM OF TEN (10) FEET FROM THE STREAM BANKS TO PREVENT ENTRY OF SPOIL INTO THE STREAM FLOW. SPOIL SHALL BE CONTAINED AS NECESSARY USING EITHER A STRAW BALE BARRIER OR AN EARTH/ROCK BERM.

7. CLEANUP BANK STABILIZATION RESTORATION – CONTRACTOR SHALL RESTORE THE STREAM BED AND BANKS TO APPROXIMATE PRECONSTRUCTION CONTOURS, UNLESS OTHERWISE APPROVED BY THE COMPANY. CONTRACTOR SHALL INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATER COURSE AND WETLAND BOUNDARIES UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.
8. TEMPORARY VEHICLE CROSSING – VEHICLE CROSSING CAN BE CONSTRUCTED USING EITHER A FLUME CROSSING OR A TEMPORARY BRIDGE.

9. REFERENCE – REFER TO WATER BODY AND WETLAND CROSSING PROCEDURES FOR REQUIREMENTS.

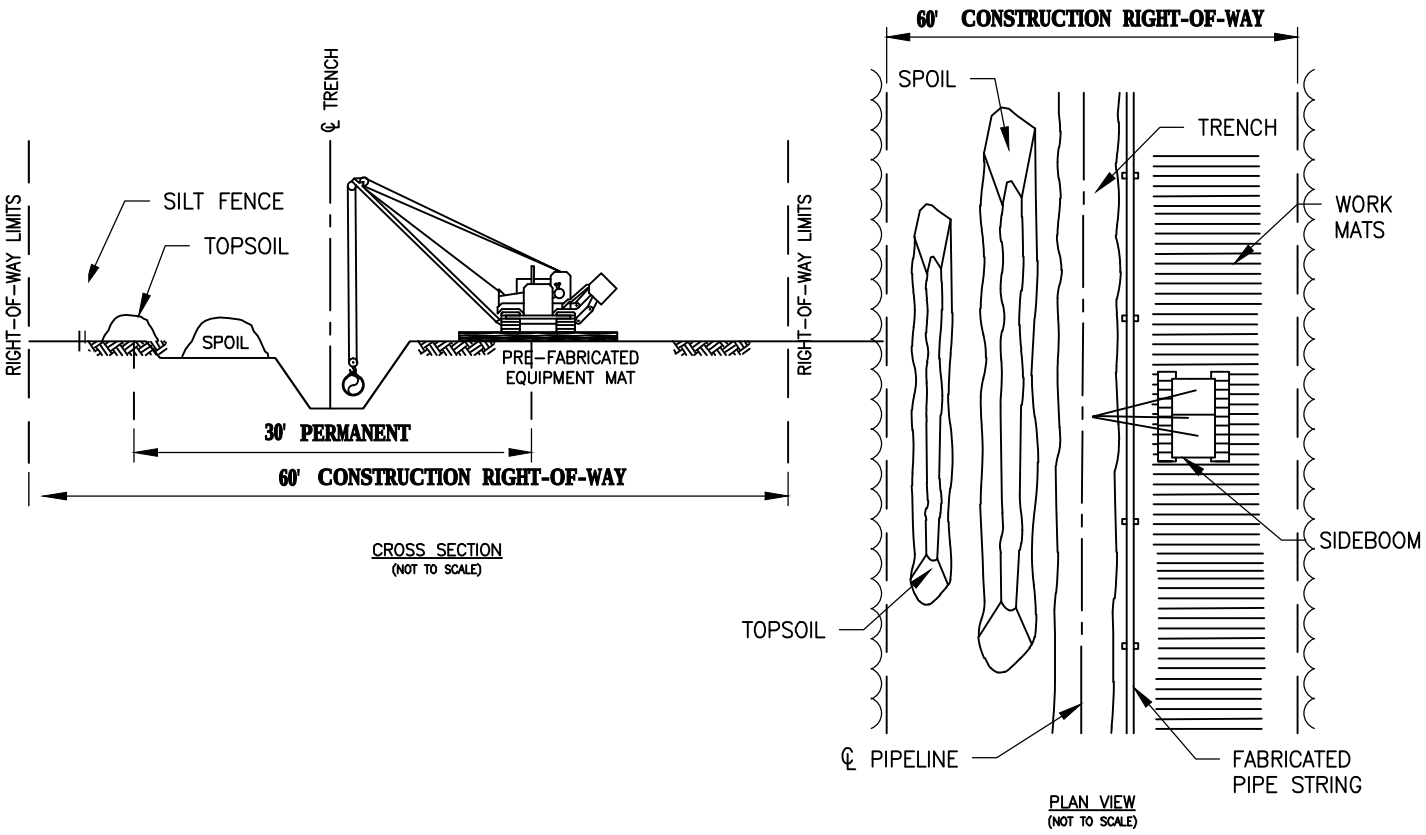
REFER TO SHEET 1 OF 2

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

EROSION CONTROL
OPEN CUT WET CROSSING
(NOTES)

DRAWING NUMBER	SHEET
TYP-014A	2 OF 2



CONSTRUCTION PROCEDURE NOTES:

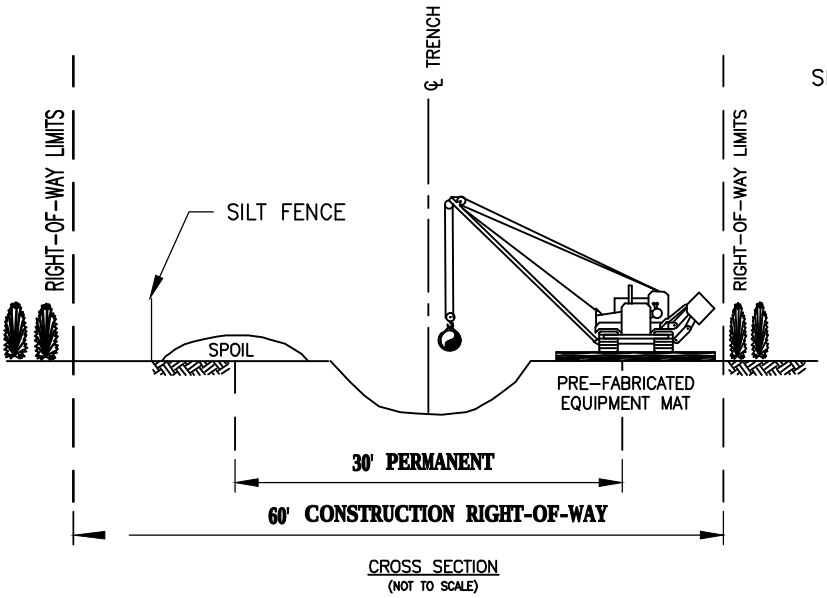
1. FLAG WETLAND BOUNDARIES PRIOR TO CLEARING. VEGETATION CANNOT BE CLEARED WITHIN A 10' BUFFER BETWEEN WETLAND BOUNDARIES AND CONSTRUCTION ROW, EXCEPT OVER THE TRENCH.
2. NO REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 500 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 500 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPCC PLAN.
3. INSTALL TEMPORARY SLOPE BREAKER UPSLOPE WITHIN 100 FEET OF WETLAND BOUNDARY IF DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
4. CONSTRUCT WHEN DRY, IF POSSIBLE. IF SITE BECOMES WET AT TIME OF TRENCHING, AVOID SOIL COMPACTION BY UTILIZING TIMBER RIP-RAP OR PREFABRICATED EQUIPMENT MATS.
5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS (STRAW BALES AND/OR SILT FENCE) AT DOWN SLOPE EDGE OF RIGHT-OF-WAY ALONG WETLAND EDGE IF EVIDENT, OTHERWISE INSTALL BARRIER ON BOTH EDGES.
6. RESTRICT ROOT GRUBBING TO ONLY THAT AREA OVER THE DITCHLINE AND DITCH SPOIL AREAS. GRIND STUMPS IF NECESSARY IN OTHER AREAS TO FACILITATE CONSTRUCTION.
7. CONDUCT TRENCH LINE TOPSOIL STRIPPING (IF TOPSOIL IS NOT SATURATED). SALVAGE TOPSOIL TO ACTUAL DEPTH OR A MAXIMUM DEPTH OF TWELVE (12) INCHES, AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR. SEGREGATED TOPSOIL PILE MAY BE LOCATED ON SPOIL SIDE, AS REQUIRED.
8. TRENCH THROUGH WETLANDS.
9. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND AND ADJACENT TO ALIGNMENT, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN.
10. LOWER IN PIPE. PRIOR TO BACKFILLING TRENCH, TRENCH PLUG REQUIREMENTS SHALL BE DETERMINED BY THE ENVIRONMENTAL INSPECTOR. BACKFILL TRENCH.
11. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL PERMANENT EROSION CONTROL.
12. REMOVE ANY TIMBER MATS OR PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.

NO.	REVISION	DATE	APPR.

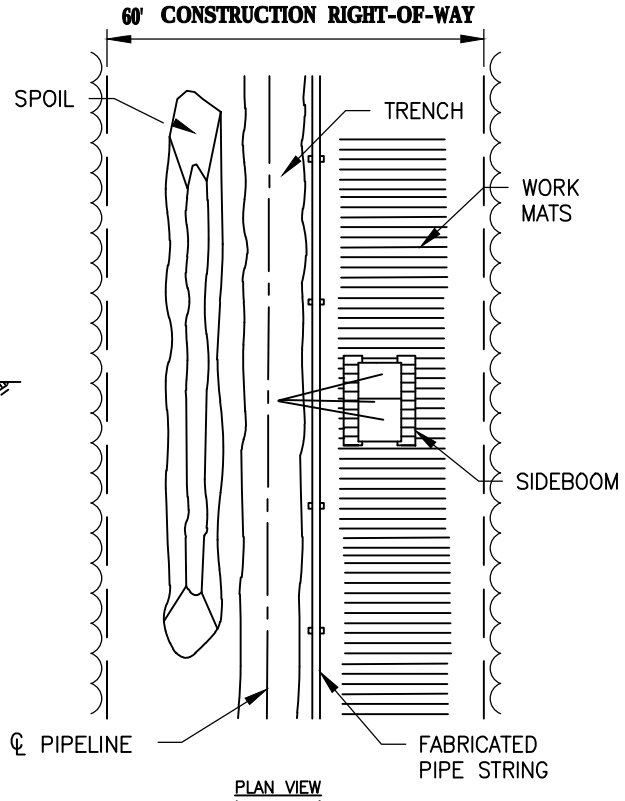
Blue Mountain Midstream

TYPE 1
UNSATURATED WETLAND CROSSING

DRAWING NUMBER	SHEET
TYP-015	1 OF 1



CROSS SECTION
(NOT TO SCALE)



PLAN VIEW
(NOT TO SCALE)

CONSTRUCTION PROCEDURE NOTES:

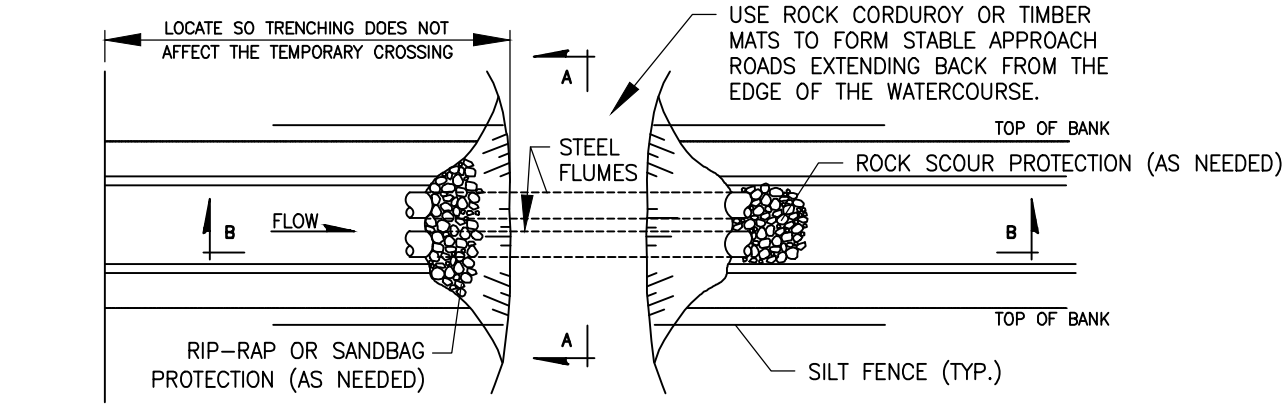
1. FLAG WETLAND BOUNDARIES PRIOR TO CLEARING. VEGETATION CANNOT BE CLEARED WITHIN A 10' BUFFER BETWEEN WETLAND BOUNDARIES AND CONSTRUCTION ROW EXCEPT OVER THE TRENCH.
2. NO REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 500 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS 500 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER SPCC PLAN
3. INSTALL TEMPORARY SLOPE BREAKER UPSLOPE WITHIN 100 FEET OF WETLAND BOUNDARY IF DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
4. MINIMIZE SOIL COMPACTION BY UTILIZING PREFABRICATED EQUIPMENT MATS.
5. AVOID ADJACENT WETLANDS. INSTALL SEDIMENT BARRIERS (STRAW BALES AND/OR SILT FENCE) AT DOWN SLOPE EDGE OF RIGHT-OF-WAY AND ALONG WETLAND EDGE AS REQUIRED.
6. RESTRICT ROOT GRUBBING TO ONLY THAT AREA OVER THE DITCHLINE AND DITCH SPOIL AREAS. GRIND STUMPS IF NECESSARY IN OTHER AREAS TO FACILITATE CONSTRUCTION.
7. TOPSOIL STRIPPING SHALL NOT BE REQUIRED IN SATURATED SOIL CONDITIONS.
8. LEAVE HARD PLUGS AT THE EDGE OF WETLAND UNTIL JUST PRIOR TO TRENCHING.
9. INSTALL TIMBER MATS THROUGH WETLAND AREA AS NEEDED OR DIRECTED BY ENVIRONMENTAL INSPECTOR. EQUIPMENT NECESSARY FOR RIGHT-OF-WAY CLEARING MAY MAKE ONE (1) PASS THROUGH THE WETLAND BEFORE MATS ARE INSTALLED.
10. TRENCH THROUGH WETLANDS.
11. PIPE SECTION MAY BE FABRICATED WITHIN THE WETLAND AND ADJACENT TO ALIGNMENT, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN.
12. LOWER IN PIPE, INSTALL TRENCH PLUGS AT WETLAND EDGES IF DIRECTED BY THE ENVIRONMENTAL INSPECTOR AND BACKFILL IMMEDIATELY.
13. REMOVE ANY TIMBER MATS OR PREFABRICATED MATS FROM WETLANDS UPON COMPLETION.
14. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL PERMANENT EROSION CONTROL.
15. GENERALLY, SEEDING IN WETLANDS WILL NOT BE NECESSARY SINCE WETLANDS REVEGETATE QUICKLY AND SOD WILL REMAIN INTACT EXCEPT OVER TRENCH. THE CONTRACTOR SHALL SEED ANY WETLANDS THAT MAY REQUIRE SEEDING AS DETERMINED BY THE ENVIRONMENTAL INSPECTOR.

NO.	REVISION	DATE	APPR.

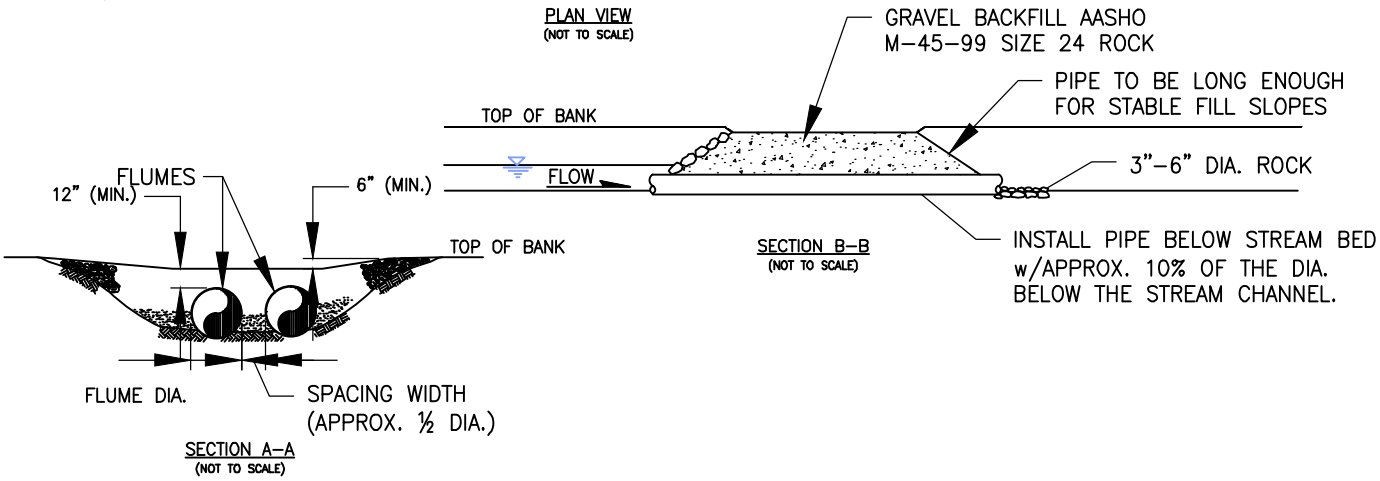
Blue Mountain Midstream

TYPE II
SATURATED WETLAND CROSSING

DRAWING NUMBER	SHEET
TYP-016	1 OF 1



PLAN VIEW
(NOT TO SCALE)



SECTION A-A
(NOT TO SCALE)

SECTION B-B
(NOT TO SCALE)

THE FOLLOWING IS A SEQUENCE OF CONSTRUCTION AND MITIGATION MEASURES TO BE FOLLOWED AT ALL TEMPORARY FLUME VEHICLE CROSSINGS.

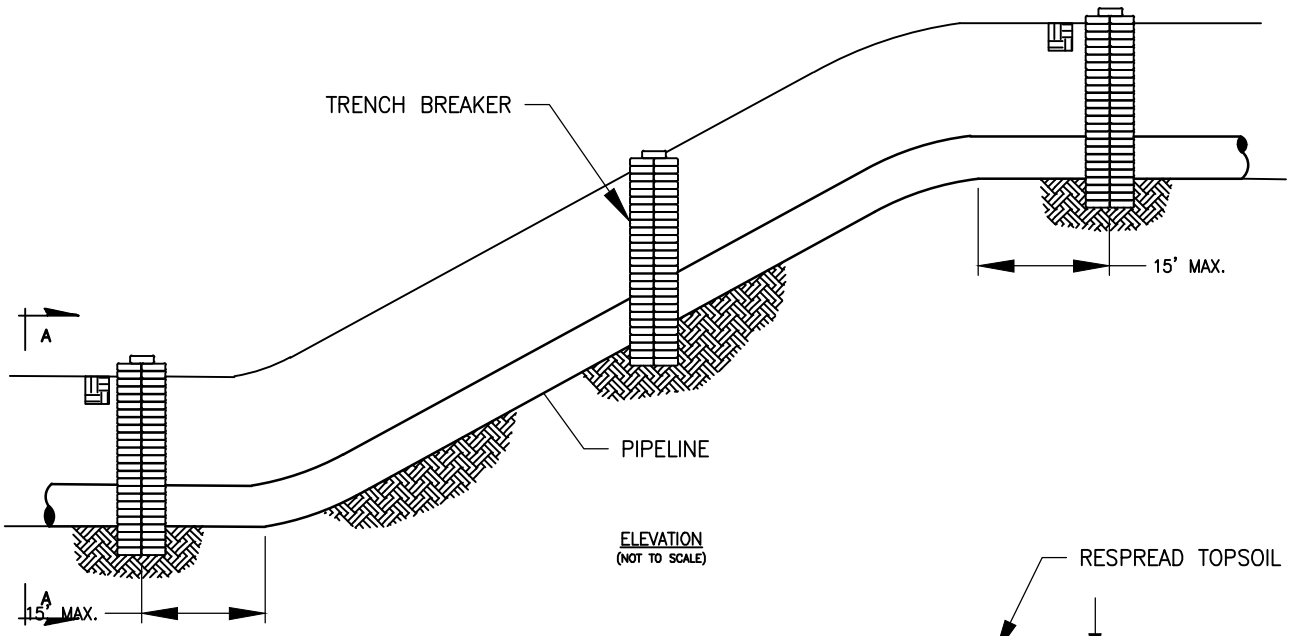
1. A PORTABLE FLEXI-FLOAT, OR TEMPORARY BRIDGE MAY BE SUBSTITUTED FOR THE TEMPORARY FLUME CROSSING.
2. THE LENGTH OF THE FLUME SHALL BE SUFFICIENT TO SPAN THE ENTIRE AREA REQUIRED FOR VEHICULAR ACCESS, EXTENDING FOUR (4) FEET BEYOND TOE OF FILL MATERIAL, SO TRENCHING WILL NOT AFFECT THE ROAD CROSSING. A LONGER PIPE IS TO BE USED, IF NEEDED, TO MAINTAIN STABLE SIDE SLOPES. FLUME CAPACITY TO BE BASED ON THE TWO (2) YEAR DESIGN FLOW OR MAXIMUM FLOW ANTICIPATED TO OCCUR DURING INSTALLATION, AS SPECIFIED IN CONSTRUCTION DOCUMENTS.
3. BACKFILL AROUND THE PIPES WITH CLEAN COARSE ROCK FILL MATERIAL. AASHO SPECIFICATION NO. M45-99 SIZE 24. TIMBER EQUIPMENT MATS OR TIMBER CORDUROY MAY BE PLACED ON THE ROCK FILL FOR A DRIVING SURFACE.
4. ROCK WITH DIAMETERS OF 3 TO 6 INCHES SHALL BE PLACED ON THE STREAMBED DOWNSTREAM OF THE FLUME OUTLET. THE ROCK SHALL EXTEND DOWNSTREAM TWO (2) FLUME DIAMETERS.
5. TO REDUCE MUD ENTERING THE WATER FROM EQUIPMENT TRACKS, THE APPROACH ROAD LEADING TO THE FLUME CROSSING MUST BE RAISED AND STABLE SO EQUIPMENT LOADS ARE SUPPORTED A SUFFICIENT DISTANCE BACK FROM THE WATER. IF CUTS ARE NEEDED TO OBTAIN A SATISFACTORY GRADE, THEY ARE TO BE DUG WITH SIDE DITCHES AND STABLE SLOPES. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO LIMIT THE POTENTIAL FOR SEDIMENT TO ENTER THE WATERWAY (E.G., CHECK DAMS, SILT FENCE, RIP-RAP, SEED AND MULCH, SEDIMENT TRAPS, ETC.).
6. PERIODICALLY CHECK THE TEMPORARY CROSSING INSTALLATION AND REMOVE ANY BUILD-UP OF SEDIMENT OR DEBRIS ON THE BRIDGE. STORE THIS MATERIAL AT LEAST 100 FEET FROM THE WATERCOURSE AND ABOVE THE HIGH WATER LEVEL, IN AN APPROVED AREA.

NO.	REVISION	DATE	APPR.

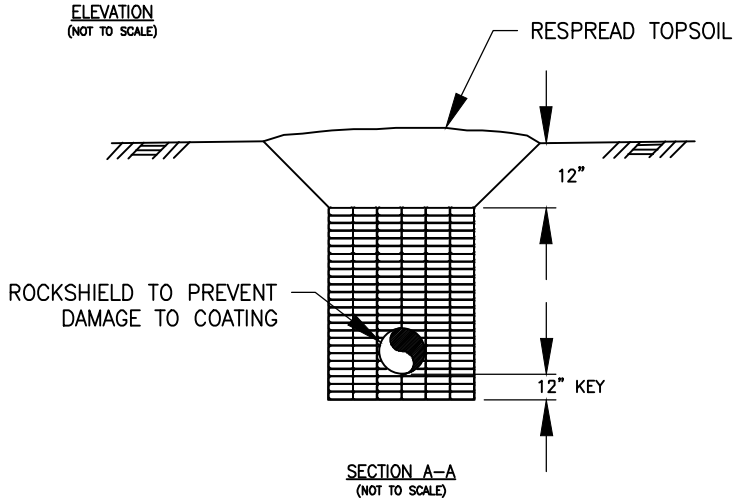
Blue Mountain Midstream

EROSION CONTROL
FLUMED EQUIPMENT CROSSING

DRAWING NUMBER	SHEET
TYP-017	1 OF 1



ELEVATION
(NOT TO SCALE)



SECTION A–A
(NOT TO SCALE)

SLOPE (%)	SPACING (FEET)
5–15	300
>15–30	200
>30	100

NOTES:

1. INSTALL TRENCH BREAKERS PER ENVIRONMENTAL INSPECTOR WHERE PIPELINE TRENCH MAY DRAIN A WETLAND OR DIVERT A STREAM. BREAKERS SHALL ALSO BE INSTALLED WHERE NATURAL DRAINAGE PATTERN, PROFILE AND TYPE OF BACKFILL MATERIAL MAY RESULT IN LOSS OF BACKFILL MATERIAL OR ALTERATION OF NATURAL DRAINAGE PATTERN.

2. INSTALL TRENCH BREAKERS IMMEDIATELY UPSLOPE OF ALL DIVERSION BERMS UNLESS OTHERWISE AUTHORIZED BY THE ENVIRONMENTAL INSPECTOR.

3. SLOPE BREAKER LOCATIONS AND SPACING SHALL BE DETERMINED IN ACCORDANCE WITH "THE UPLAND EROSION CONTROL, REVEGETATION AND MAINTENANCE PLAN" AND ENVIRONMENTAL SPECIFICATIONS.

4. KEY EACH TRENCH BREAKER A MINIMUM OF ONE (1) FOOT INTO BOTTOMS AND SIDES OF TRENCH.

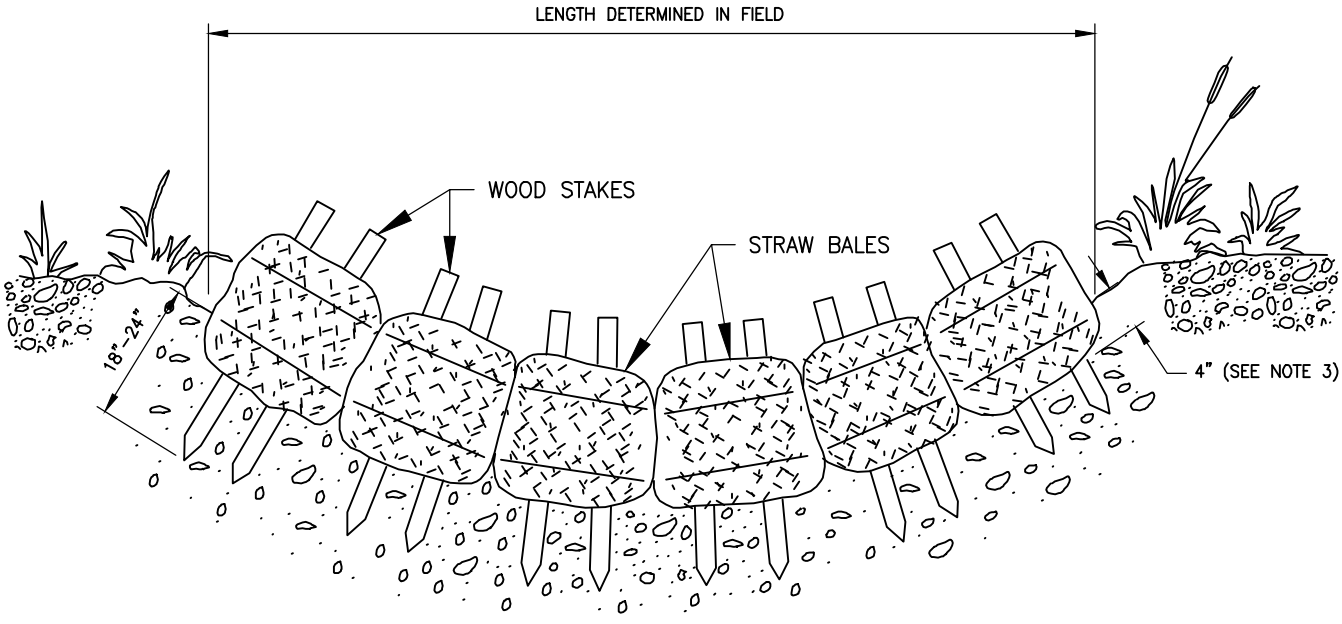
5. OPEN WEAVE HEMP OR JUTE SACKS SHALL BE FILLED WITH AN AVERAGE 55 LBS. MIXTURE OF:
   1) ONE (1) PART CEMENT AND SIX (6) PARTS SAND OR SUBSOIL, OR
   2) ONE (1) PART CEMENT, THREE (3) PARTS FLYASH, AND FIVE (5) PARTS SAND OR SUBSOIL WITH JUST SUFFICIENT WATER TO PERMIT MIXTURE TO EXUDE AND BOND SACKS TOGETHER. TOPSOIL IS NOT TO BE USED IN SACKS. ALTERNATIVELY, FOAM TRENCH BREAKERS MAY BE USED AS SPECIFIED BY THE ENVIRONMENTAL INSPECTOR.

NO.	REVISION	DATE	APPR.

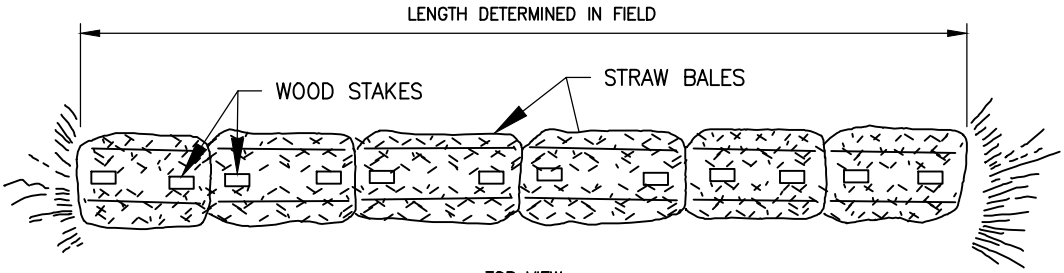
Blue Mountain Midstream

PERMANENT TRENCH BREAKERS

DRAWING NUMBER	SHEET
TYP-018	1 OF 1



FRONT VIEW



TOP VIEW

NOTES:

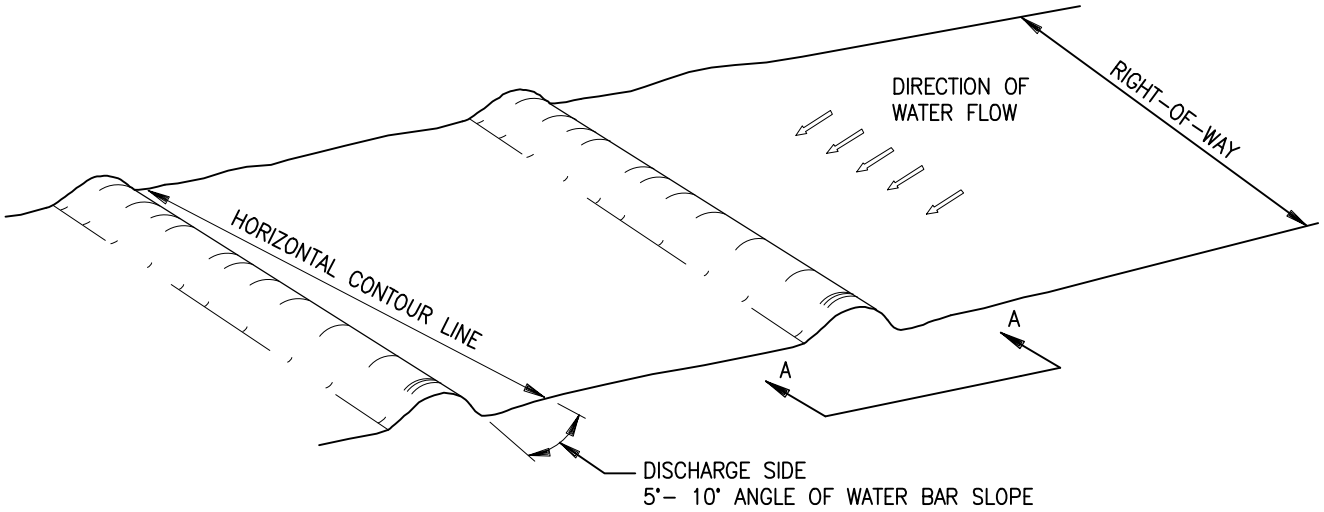
1. INSTALL PRIOR TO GRADING.
2. ANGLE FIRST STAKE TOWARD PREVIOUSLY LAID BALE.
3. IMBED BALES IN EARTH APPROXIMATELY FOUR (4) INCHES.
4. WHEN REMOVING BALES, SCATTER SILT AND STRAW OVER RIGHT-OF-WAY.
5. ALL MATERIALS TO BE SUPPLIED BY CONTRACTOR.

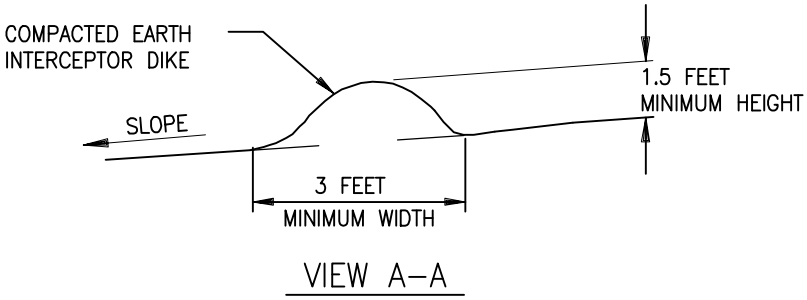
NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

EROSION CONTROL
STAKED STRAW BALES

DRAWING NUMBER	SHEET
TYP-019	1 OF 1





VIEW A–A

SLOPE BREAKER SPACING	
GRADE, %	SPACING
0 – 5	NONE REQ'D
5 – 15	300
15 – 30	200
> 30	100

NOTES:

1. WATER SHALL BE DIVERTED OFF THE GRADED RIGHT–OF–WAY BY CONSTRUCTING SLOPE BREAKERS ACCORDING TO THE FOLLOWING PROCEDURE.

   A. THE HORIZONTAL CONTOUR LINE ACROSS THE ENTIRE RIGHT–OF–WAY WIDTH WILL BE ESTABLISHED AT EACH INTERCEPT OR SLOPE BREAKERS. THE HORIZONTAL CONTOUR LINE WILL BE PERPENDICULAR TO THE DIRECTION OF FLOW. A SURVEYOR'S LEVEL OR HAND LEVEL WILL BE USED TO LOCATE THE CONTOUR LINE.

   B. THE SLOPE BREAKER SHALL SLOPE DOWNHILL 5° – 10° FROM HORIZONTAL CONTOUR LINE AND TOWARD DISCHARGE SIDE. CHANNEL THE FLOW TO THE SIDE OF THE GRADED RIGHT–OF–WAY WITH THE BEST VEGETATIVE COVER AND TOPOGRAPHY. IF VEGETATION IS SPARSE SECURE OUTLET WITH STRAW BALES.

2. SLOPE BREAKER SPACING SHALL BE IN ACCORDANCE WITH LOCAL SOIL CONSERVATION SERVICE RECOMMENDATIONS. IN ABSENCE OF THESE RECOMMENDATIONS THE ABOVE TABLE SHALL BE USED.

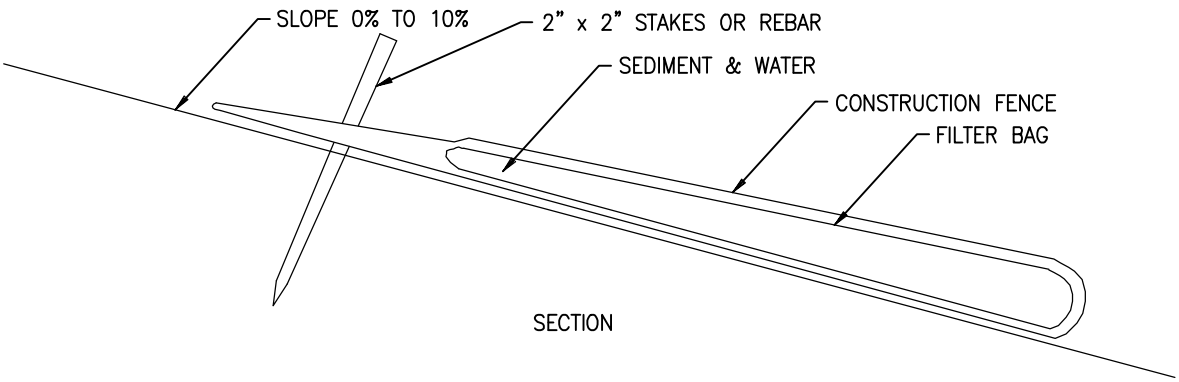
3. REFER TO "ENVIRONMENTAL AND RIGHT–OF–WAY STIPULATIONS" FOR INSTALLATION.

NO.	REVISION	DATE	APPR.

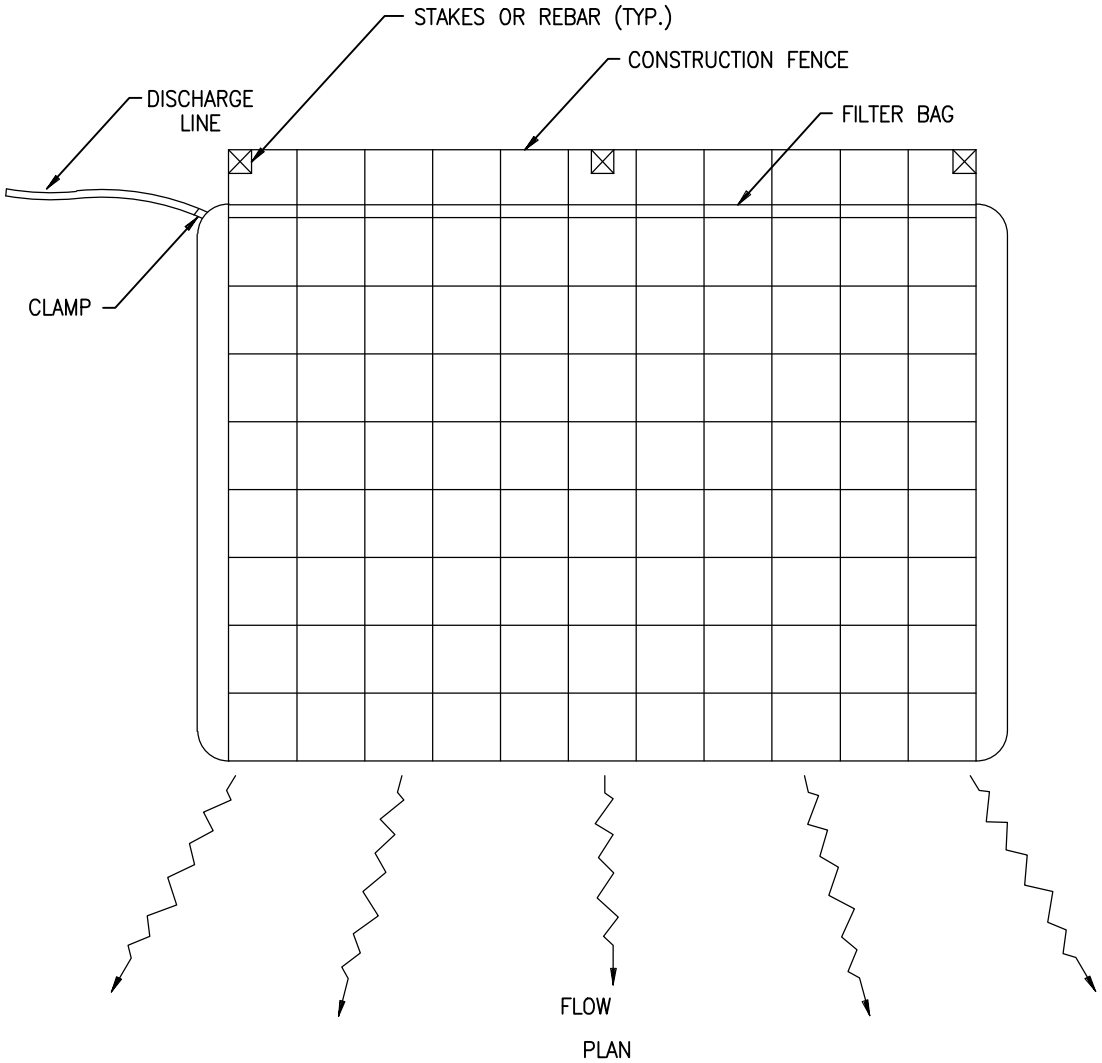
Blue Mountain Midstream

EROSION CONTROL
SLOPE BREAKERS

DRAWING NUMBER	SHEET
TYP-020	1 OF 1



SECTION



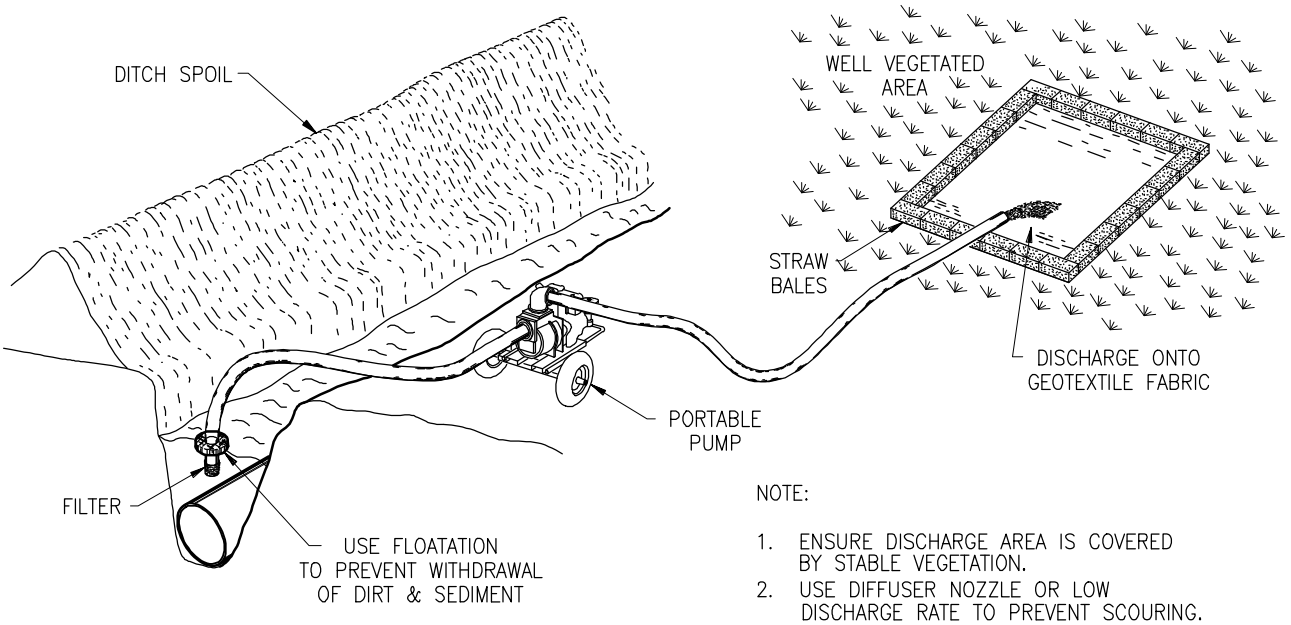
PLAN

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

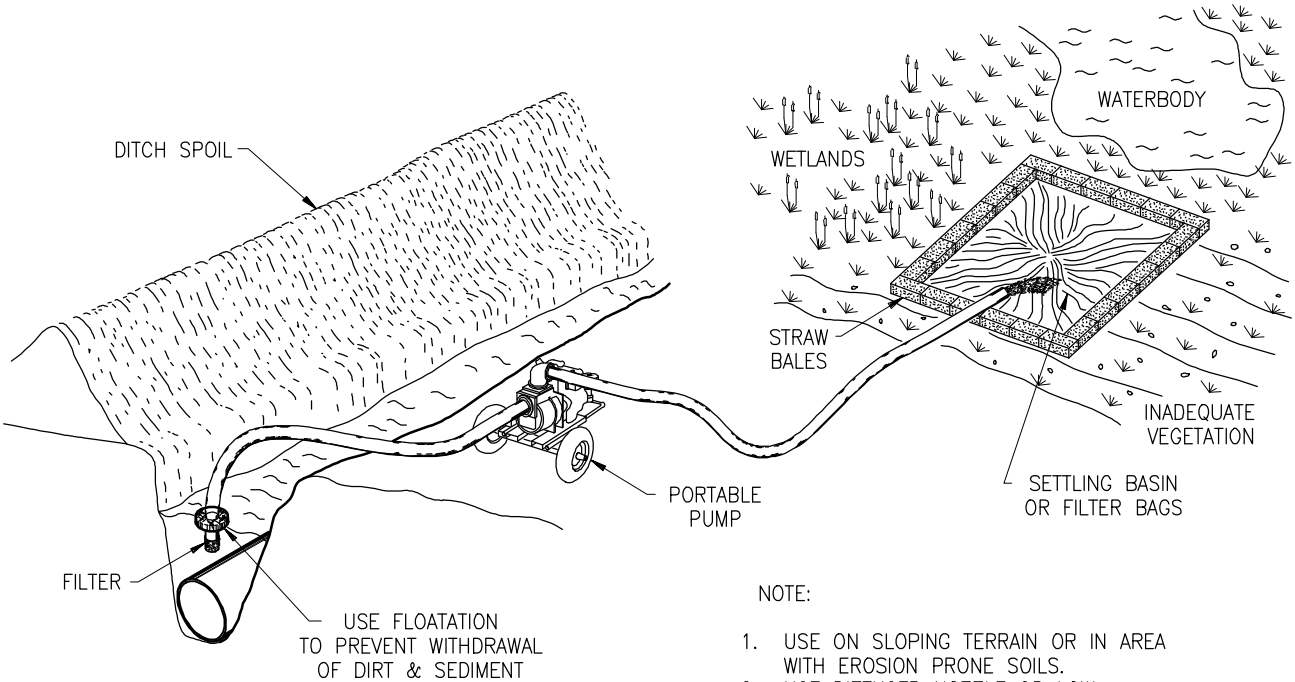
TRENCH DEWATERING
FILTER BAG

DRAWING NUMBER	SHEET
TYP-021	1 OF 1



NOTE:

1. ENSURE DISCHARGE AREA IS COVERED BY STABLE VEGETATION.
2. USE DIFFUSER NOZZLE OR LOW DISCHARGE RATE TO PREVENT SCOURING.
3. USE A FLOATATION DEVICE ON INTAKE; & MAINTAIN DISTANCE FROM SIDES & BOTTOM OF DITCH.



NOTE:

1. USE ON SLOPING TERRAIN OR IN AREA WITH EROSION PRONE SOILS.
2. USE DIFFUSER NOZZLE OR LOW DISCHARGE RATE TO PREVENT SCOURING.
3. ADDITIONAL STRAW BALES MAY BE USED TO INCREASE RETENTION & FILTERING.
4. USE A FLOATATION DEVICE ON INTAKE; & MAINTAIN DISTANCE FROM SIDES & BOTTOM OF DITCH.

NO.	REVISION	DATE	APPR.

Blue Mountain Midstream

TRENCH DEWATERING

DRAWING NUMBER	SHEET
TYP-022	1 OF 1

APPENDIX C

Birds of Conservation Concern with Potential to Occur in the Project Area

Appendix C Birds of Conservation Concern with Potential to Occur in the Project Area			
Species	**Season Present**	**Preferred Habitat**	**Assessment of Potential Impacts**
Bald Eagle *Haliaeetus leucocephalus*	Wintering	Occurs in coasts, rivers, lakes, reservoirs, and marshes. During migration, occurs in mountains and open country as well. Prefers conifers for nesting and roosting and tends to avoid areas with high human traffic.	Suitable habitat is not present in the Project area.
Bell's Vireo *Vireo bellii*	Breeding	Occurs in willows and stream sides. Breeds in dense, low, shrubby vegetation, riparian areas, scrub or brushy fields, young second-growth forest or woodland, scrub oak, coastal chaparral, and mesquite brush lands, often near water in arid regions. Winters in the tropics in dense low scrub, mostly near water.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.
Black Rail *Laterallus jamaicensis*	Breeding	Occurs in grassy marshes, especially very shallow water or damp soil with scattered puddles, and wet meadows. Nests in high portions of salt marshes, shallow freshwater marshes, wet meadows, and flooded grassy vegetation.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.
Buff-breasted Sandpiper *Calidris subruficollis*	Migration	Breeds in dry, grassy tundra. During migration and in winter, found in dry grasslands (usually short grass), shortgrass prairies, pastures, plowed fields, rarely mudflats, and sometimes on shores of lakes or ponds, or on coastal flats.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Cassin's Sparrow *Peucaea cassinii*	Breeding	In migration and winter, occurs in desert grassland and brushy fields. Breeds in a variety of situations with good ground cover of grass and low shrubs.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.
Chestnut-collared Longspur *Calcarius ornatus*	Wintering	Breeds on short-grass plains and prairies in areas of slightly taller grass and weeds. Winters in plains, prairies, and open cultivated fields.	Suitable wintering habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Harris's Sparrow *Zonotrichia querula*	Wintering	Breeds in Northern Canada in the zone where northern forest transitions into tundra. Winters in brush, open woods, hedgerows, agricultural fields, and shrubby pastures.	Suitable wintering habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.

Appendix C Birds of Conservation Concern with Potential to Occur in the Project Area			
Species	**Season Present**	**Preferred Habitat**	**Assessment of Potential Impacts**
Henslow's Sparrow *Ammodramus henslowii*	Outside of range	Breeds in fields and meadows, often in low-lying or damp areas, with tall grass, standing dead weeds, and scattered shrubs. Sometimes found in old pastures and hayfields. Winters in various kinds of rank weedy fields.	The Project does not occur in the known range of the species.
Hudsonian Godwit *Limosa haemastica*	Migration	Breeds on grassy tundra near water, marshes, prairie pools, and mudflats. Winters and migrates along marshes, beaches, flooded fields, and tidal mudflats. During migration, found on shallow marshy lakes, flooded pastures, rice fields, and mudflats around ponds.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Lark Bunting *Calamospiza melanocorys*	Breeding	Occurs in plains, prairies, meadows, and sagebrush. Breeds in shortgrass prairie and sagebrush plains. Winters in prairies, desert grassland, cultivated lands, and brushy areas.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.
Lesser Prairie-Chicken *Tympanuchus pallidicinctus*	Outside of range	Occurs in sandhill country, sage and bluestem grass, oak shinnery, and sandy short-grass prairie regions with scattered shrubs. Often found around stands of low, scrubby oaks.	The Project does not occur in the known range of the species.
Little Blue Heron *Egretta caerulea*	Breeding	Occurs in marshes, swamps, rice fields, ponds, and shores. Winters near mangroves, lagoons, salt ponds, mudflats, streams, tidal flats, canals, ditches, fish hatcheries, flooded fields, savannas, wet meadows, and dry fields. Nests in trees, shrubs, or in dense low thickets near water.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.
Loggerhead Shrike *Lanius ludovicianus*	Year-round	Inhabits semi-open country with short vegetation including cultivated fields, desert scrublands, savannas, and prairies Prefers habitat with available lookout posts, including wires, trees, scrub. Breeds in any kind of semi-open terrain, from large clearings in wooded regions to open grassland or desert with a few scattered trees or large shrubs.	Suitable habitat exists in Project area; however, the species is highly mobile and would most likely relocate to adjacent suitable habitat. Additionally, all clearing activities will occur outside of the nesting season.

Appendix C Birds of Conservation Concern with Potential to Occur in the Project Area			
Species	**Season Present**	**Preferred Habitat**	**Assessment of Potential Impacts**
Long-billed Curlew *Numenius americanus*	Migration	Breeds in sparse, short grasses, including agricultural fields, pastures, and shortgrass, mixed-grass, and sagebrush prairies. Winters in wetlands, tidal estuaries, mudflats, flooded fields, beaches, cultivated land, tide flats, and salt marshes. During migration, often found in farm fields, marshes, coastal mudflats, and grasslands.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Marbled Godwit *Limosa fedoa*	Migration	Inhabits prairies, pools, shores, and tide flats. Breeds in native prairie, marshes, and flooded plains. During migration and winter, occurs on tidal mudflats, marshes, ponds, and beaches.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
McCown's Longspur *Rhynchophanes mccownii*	Migration	Inhabits shortgrass plains, prairies, and plowed fields in all seasons. Breeds in dry, open shortgrass prairie. Wintering and migration habitat includes shortgrass prairies, and bare soil, including dry lake beds and plowed fields.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats. Additionally, all clearing activities would occur outside of the nesting season.
Mississippi Kite *Ictinia mississippiensis*	Breeding	Inhabits wooded streams, groves, bottomland hardwood forest, and southern prairies. Nests in tall trees along rivers, in towns, and near open country.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.
Mountain Plover *Charadrius montanus*	Outside of range	Occurs in semi-arid plains, grasslands, plateaus. Breeds on open shortgrass prairie at moderate elevations, including overgrazed pasture and arid plains. Wintering and migration habitat includes short-grass plains and fields, plowed fields, and sandy deserts.	The Project does not occur in the known range of the species.
Red-headed Woodpecker *Melanerpes erythrocephalus*	Year-round	Inhabits pine savannas and other open forests with clear understories, forest edges, open pine plantations, standing timber, groves, farm country, orchards, shade trees in towns, large scattered trees. Avoids unbroken forest, favoring open country or forest clearings.	Suitable habitat exists in Project area; however, the species is highly mobile and would most likely relocate to adjacent suitable habitat. Additionally, all clearing activities would occur outside of the nesting season.
Scissor-tailed Flycatcher *Tyrannus forficatus*	Breeding	Inhabits semi-open country, ranches, farms, roadsides, and grassland or farmland with scattered trees or isolated groves. Breeds in open grassland around scattered trees or utility lines. Winters in open or semi-open country in the tropics.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.

Appendix C Birds of Conservation Concern with Potential to Occur in the Project Area			
Species	**Season Present**	**Preferred Habitat**	**Assessment of Potential Impacts**
Short-billed Dowitcher *Limnodromus griseus*	Migration	Migrants and wintering birds favor coastal habitats, especially tidal flats on protected estuaries and bays, lagoons, salt marshes, and sandy beaches. Breeds in the far north, mostly in muskegs and edges of lakes within coniferous forest zone.	Suitable habitat is not present in the Project area.
Smith's Longspur *Calcarius pictus*	Wintering	Breeds along the tree line in the dry, grassy, and hummocky tundra. Winters on shortgrass prairies, heavily grazed pastures, and airport fields.	Suitable wintering habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Snowy Plover *Charadrius nivosus*	Breeding	Inhabits barren to sparsely-vegetated coastal dry sand beaches, salt pans, river bars, or alkali flats.	Suitable habitat is not present in the Project area.
Solitary Sandpiper *Tringa solitaria*	Migration	Breeds in muskeg region in taiga, nesting in trees in deserted songbird nests. During migration and winter, found along freshwater ponds, stream edges, marshes, riverbanks, temporary pools, and flooded ditches and fields; more commonly found in wooded regions, and less frequently on mudflats and open marshes.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Sprague's Pipit *Anthus spragueii*	Migration	Occurs in plains and shortgrass prairies. Breeds, winters, and migrates in open dry grassland, avoiding brushy areas and cultivated fields.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Swainson's Hawk *Buteo swainsoni*	Breeding	Inhabits plains, dry grassland, farmland, and ranch country. Breeds in trees in grasslands, sage flats, and agricultural fields.	Suitable breeding habitat exists in the Project area; however, clearing activities would occur outside of the nesting season.
Upland Sandpiper *Bartramia longicauda*	Migration	Occurs in native prairie, dry grassland, and open meadows. Nests in native grassland. During migration, stops on open pastures and lawns.	Suitable migration habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.
Sources: FWS, 2008; National Audubon Society, 2017; Cornell Lab of Ornithology, 2011			