Federal Energy Regulatory Commission

Office of Energy Projects

December 2018

Cheyenne Connector, LLC — **Docket Nos. CP18-102-000**
Rockies Express Pipeline LLC — **CP18-103-000**

Cheyenne Connector Pipeline and Cheyenne Hub Enhancement Projects

Environmental Assessment

Washington, DC 20426

Cover photograph (left): A predominantly rural landscape forming a patchwork of open grasslands, areas of active cultivation, scattered farmsteads, widespread agricultural operations, and numerous active and abandoned oil and gas wells and infrastructure characterizes the proposed Projects' areas.

Cover photograph (right): One of the existing natural gas processing facilities that would be served by the Projects is seen in the background.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 4
Cheyenne Connector, LLC
Rockies Express Pipeline LLC
Cheyenne Connector and Cheyenne Hub
Enhancement Projects
Docket Nos. CP18-102-000 and
CP18-103-000

TO THE INTERESTED PARTY:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Cheyenne Connector Pipeline Project and the Cheyenne Hub Enhancement Project, proposed respectively by Cheyenne Connector, LLC and Rockies Express Pipeline LLC (Rockies Express) in the above-referenced docket. The applicants request authorization to construct approximately 71 miles of new 36-inch-diameter pipeline, five new meter and regulating stations, and one new compressor station, as described further below. All proposed facilities would be in Weld County, Colorado.

The EA assesses the potential environmental effects of the construction and operation of the Cheyenne Connector Pipeline and Cheyenne Hub Enhancement Projects in accordance with the requirements of the National Environmental Policy Act (NEPA). The FERC staff concludes that approval of the proposed projects, with appropriate mitigating measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The Cheyenne Connector Pipeline Project includes the following facilities:

- approximately 71 miles of 36-inch-diameter pipeline with ancillary facilities including three mainline valves; and
- five associated meter and regulating stations.

The Cheyenne Hub Enhancement Project includes the following facilities:

- one new approximately 32,100 horsepower compressor station;
- enhancements to modify Rockies Express' existing Cheyenne Hub interconnect facilities, including installation of pipe, valves, fittings, filters, and ancillary equipment; and
- ancillary facilities constructed at Rockies Express' existing Cheyenne Hub pursuant to 18 CFR 2.55(a), consisting of station piping, vibration reducing equipment, compressor and electrical buildings, valves, and gas cooling equipment.

The Commission mailed a copy of the *Notice of Availability* for the EA to federal, state, and local government representatives and agencies; elected officials; environmental and public interest groups; Native American tribes; potentially affected landowners and other interested individuals and groups; and newspapers and libraries in the projects' areas. The EA is only available in electronic format. It may be viewed and downloaded from the FERC's website (www.ferc.gov), on the Environmental Documents page (https://www.ferc.gov/industries/gas/enviro/eis.asp). In addition, the EA may be accessed by using the eLibrary link on the FERC's website. Click on the eLibrary link (https://www.ferc.gov/docs-filing/elibrary.asp), click on General Search, and enter the docket number in the "Docket Number" field, excluding the last three digits (i.e., CP18-102 or CP18-103). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FercOnlineSupport@ferc.gov or toll free at (866) 208-3676, or for TTY, contact (202) 502-8659.

Any person wishing to comment on the EA may do so. Your comments should focus on the EA's disclosure and discussion of potential environmental effects, reasonable alternatives, and measures to avoid or lessen environmental impacts. The more specific your comments, the more useful they will be. To ensure that the Commission has the opportunity to consider your comments prior to making its decision on these projects, it is important that we receive your comments in Washington, DC **on or before 5:00pm Eastern Time on January 17, 2019.**

For your convenience, there are three methods you can use to file your comments to the Commission. The Commission encourages electronic filing of comments and has staff available to assist you at (866) 208-3676 or FercOnlineSupport@ferc.gov. Please carefully follow these instructions so that your comments are properly recorded.

(1) You can file your comments electronically using the eComment feature on the Commission's website (www.ferc.gov) under the link to Documents and Filings. This is an easy method for submitting brief, text-only comments on a project;

(2) You can also file your comments electronically using the eFiling feature on the Commission's website (www.ferc.gov) under the link to Documents and Filings. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "eRegister." You must select the type of filing you are making. If you are filing a comment on a particular project, please select "Comment on a Filing"; or

(3) You can file a paper copy of your comments by mailing them to the following address. Be sure to reference the project docket number (CP18-102-000 and/or CP18-103-000) with your submission: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426.

Any person seeking to become a party to the proceeding must file a motion to intervene pursuant to Rule 214 of the Commission's Rules of Practice and Procedures (18 CFR 385.214). Motions to intervene are more fully described at http://www.ferc.gov/resources/guides/how-to/intervene.asp. Only intervenors have the right to seek rehearing or judicial review of the Commission's decision. The Commission may grant affected landowners and others with environmental concerns intervenor status upon showing good cause by stating that they have a clear and direct interest in this proceeding which no other party can adequately represent. **Simply filing environmental comments will not give you intervenor status, but you do not need intervenor status to have your comments considered.**

Additional information about the project is available from the Commission's Office of External Affairs, at **(866) 208-FERC**, or on the FERC website (www.ferc.gov) using the eLibrary link. The eLibrary link also provides access to the texts of all formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. Go to www.ferc.gov/docs-filing/esubscription.asp.

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TECHNICAL ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
Applicants	Cheyenne Connector, LLC and Rockies Express Pipeline LLC
BGEPA	Bald and Golden Eagle Protection Act
BMPs	Best Management Practices
BTU	British thermal unit
CAA	Clean Air Act
CDPHE	Colorado Department of Health and Environment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Cheyenne Connector, LLC	Cheyenne Connector
CIG	Colorado Interstate Gas Company, L.L.C.
CDSS	Colorado's Decision Support Systems
CDWR	Colorado Division of Water Resources
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent emissions
Commission	Federal Energy Regulatory Commission
CPW	Colorado Parks and Wildlife
CRP	Conservation Reserve Program
CSH	Colorado State Highway
dBA	decibels on the A-weighted scale
DOT	U.S. Department of Transportation
EI	environmental inspector
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FLAG	Federal Land Managers' Air Quality Related Values Work Group
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutant
HUC	Hydrologic Unit Code
L_{eq}	24-hour equivalent sound level
L_{dn}	day-night sound level
M&R	meter and regulating
MBTA	Migratory Bird Treaty Act

MLV	mainline valve
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NNSR	Nonattainment New Source Review
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Proposed Cheyenne Connector Pipeline and Cheyenne Hub Enhancement Projects and Request for Comments on Environmental Issues*
NO_x	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSPS	New Source Performance Standards
NSR	New Source Review
OEP	Office of Energy Projects
PAR	permanent access road
PEM	palustrine emergent
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan*
$PM_{2.5}$	particulate matter less than or equal to 2.5 microns in aerodynamic diameter
PM_{10}	particulate matter less than or equal to 10 microns in aerodynamic diameter
Procedures	FERC's *Wetland and Waterbody Construction and Mitigation Procedures*
PSD	Prevention of Significant Deterioration
Rockies Express	Rockies Express Pipeline LLC
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPRP	Spill Prevention and Response Plan
TAR	temporary access road
tpy	tons per year
USACE	U.S. Army Corps of Engineers
USCB	U.S. Census Bureau
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compounds
WCR	Weld County Road

A. PROPOSED ACTION

1. Introduction

The staff of the Federal Energy Regulatory Commission (FERC or Commission) prepared this environmental assessment (EA) to address the environmental impacts of the construction and operation of the proposed Cheyenne Connector Pipeline Project and Cheyenne Hub Enhancement Project (collectively, the Projects). On December 21, 2017, Cheyenne Connector, LLC (Cheyenne Connector) and Rockies Express Pipeline LLC (Rockies Express) (collectively, the Applicants) filed respective applications with the Commission in Docket Nos. CP18-102-000 and CP18-103-000 under Section 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations. The Applicants seek to obtain a Certificate of Public Convenience and Necessity (Certificate) to construct and operate approximately 70 miles of new 36-inch-diameter pipeline, five new associated meter and regulating (M&R) stations, and one new associated compressor station in Weld County, Colorado.

We[1] prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA); the Council on Environmental Quality's (CEQ) regulations for implementing NEPA (Title 40 Code of Federal Regulations, Parts 1500-1508 [40 CFR 1500-1508]); and the Commission's regulations at 18 CFR 380. The EA is an integral part of the Commission's decision-making process on whether to issue the Applicants a 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 could result from implementation of the proposed action;
- identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize environmental impacts related to the Projects; and
- facilitate public involvement in the environmental review process.

The Applicants have requested a Certificate by February 28, 2019, to meet an in-service date of October 2019.

2. Project Purpose and Need

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 decisions on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project.

[1] "We," "us," and "our" refer to the environmental staff of the FERC's Office of Energy Projects (OEP).

According to the Applicants, the Projects' purpose is to transport up to 600,000 dekatherms per day (600 million standard cubic feet per day) from the Denver-Julesburg Basin to the Cheyenne Hub in Weld County, Colorado; and permit receipts and/or delivery from Rockies Express into the nation's interstate natural gas pipeline network via the interconnected pipelines at Cheyenne Hub.[2] Two shippers, Anadarko Energy Services Company (Anadarko) and DCP Midstream Marketing, LLC (DCP Midstream), have entered into binding Precedent Agreements with the Applicants providing for development of the Projects.

3. Scope of this Environmental Assessment

The resources and topics addressed in this EA include geology, soils, groundwater, surface waters, wetlands, fisheries, wildlife, vegetation, species of special concern, land use, recreation, visual impacts, socioeconomics, cultural resources, air quality, noise, reliability and safety, cumulative impacts, and alternatives. This EA describes the affected environment as it currently exists and the anticipated environmental consequences of the Projects, and compares the Projects' potential impact with that of various alternatives. This EA also presents our recommended mitigation measures.

As the lead federal agency for the Projects, FERC is required to comply with Section 7 of the Endangered Species Act, as amended (ESA) and Section 106 of the National Historic Preservation Act. These statutes have been considered in the preparation of this EA. In addition to FERC, other federal, state, and local agencies may use this EA in approving or issuing any permits necessary for all or part of the proposed Projects. Permits, approvals, and consultations for the Projects are discussed in section A.10 of this EA.

4. Proposed Facilities

The Cheyenne Connector Pipeline Project (Pipeline Project) would consist of the following facilities:

- approximately 71 miles of 36-inch-diameter pipeline and ancillary facilities including three mainline valves (MLVs) at pipeline mileposts 17.0, 34.1, and 51.6;
- five associated M&R stations; and
- an approximately 0.25-mile-long, 24-inch-diameter lateral pipeline connecting one of the five M&R stations (the proposed O'Connor M&R Station) to the Cheyenne Connector pipeline.

[2] The interconnected pipelines at the Cheyenne Hub include the following: Cheyenne Plains Gas Pipeline Company, L.L.C.; Colorado Interstate Gas Company, L.L.C.; Tallgrass Interstate Gas Transmission, LLC; Public Service Company of Colorado; Trailblazer Pipeline Company LLC; and Wyoming Interstate Company, L.L.C.

A. INTRODUCTION

The Cheyenne Hub Enhancement Project (Enhancement Project) modifies Rockies Express' existing Cheyenne Hub and would consist of the following facilities:

- one new approximately 32,100 horsepower compressor station (Cheyenne Hub Booster Compressor Station);
- enhancements to modify Rockies Express' existing Cheyenne Hub interconnect facilities, including installation of pipe, valves, fittings, filters, and ancillary equipment; and
- ancillary facilities constructed at Rockies Express' existing Cheyenne Hub pursuant to 18 CFR 2.55(a), consisting of station piping, vibration reducing equipment, compressor and electrical buildings, valves, and gas cooling equipment.

Figures 1 and 2 illustrate the general locations of the Projects.[3]

[3] Detailed alignment sheets for the Pipeline Project are filed in Docket Nos. CP18-102-000 and CP18-103-000 under Accession No. 20180802-5073.

A. INTRODUCTION

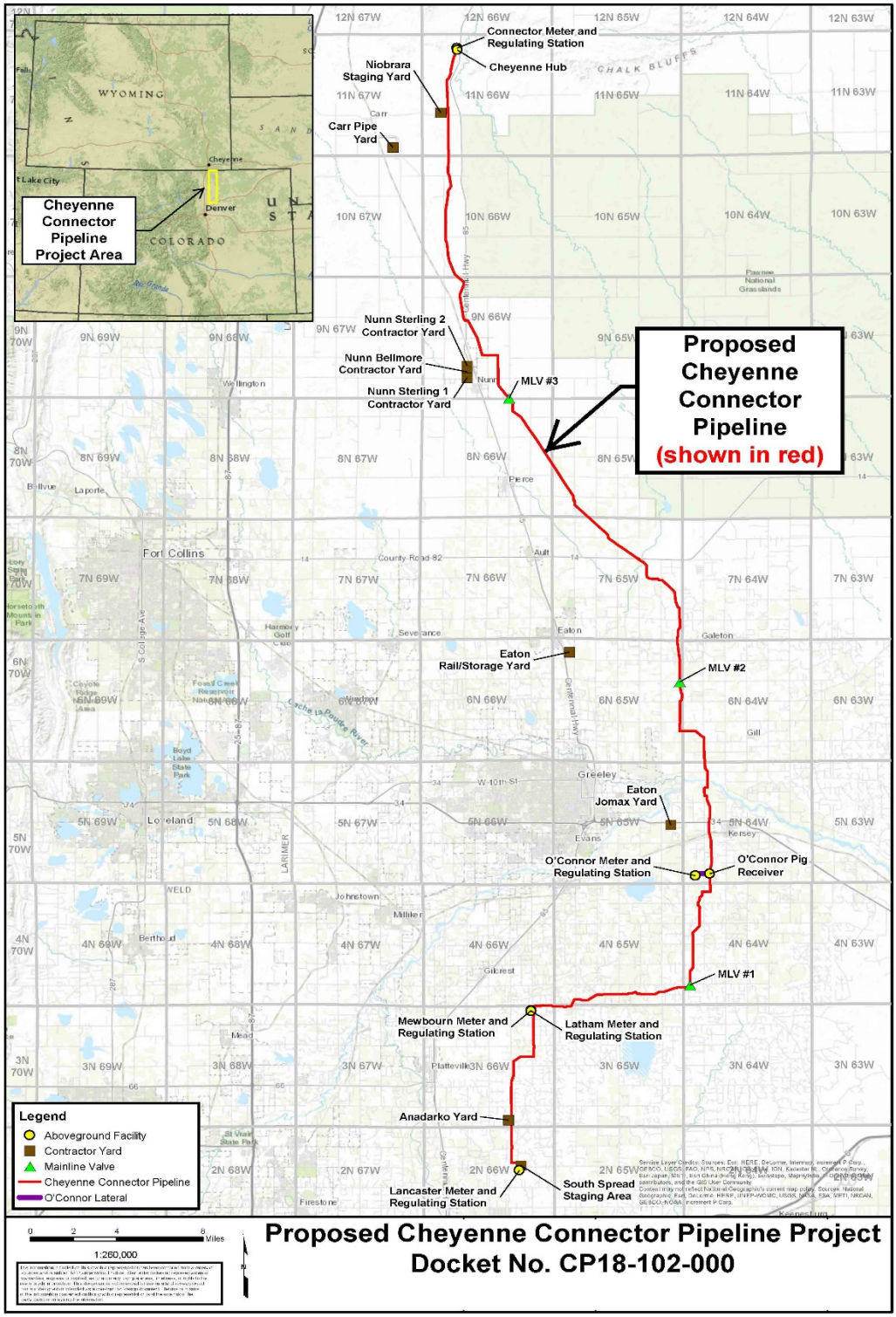

Figure 1: Cheyenne Connector Pipeline Project Overview Map

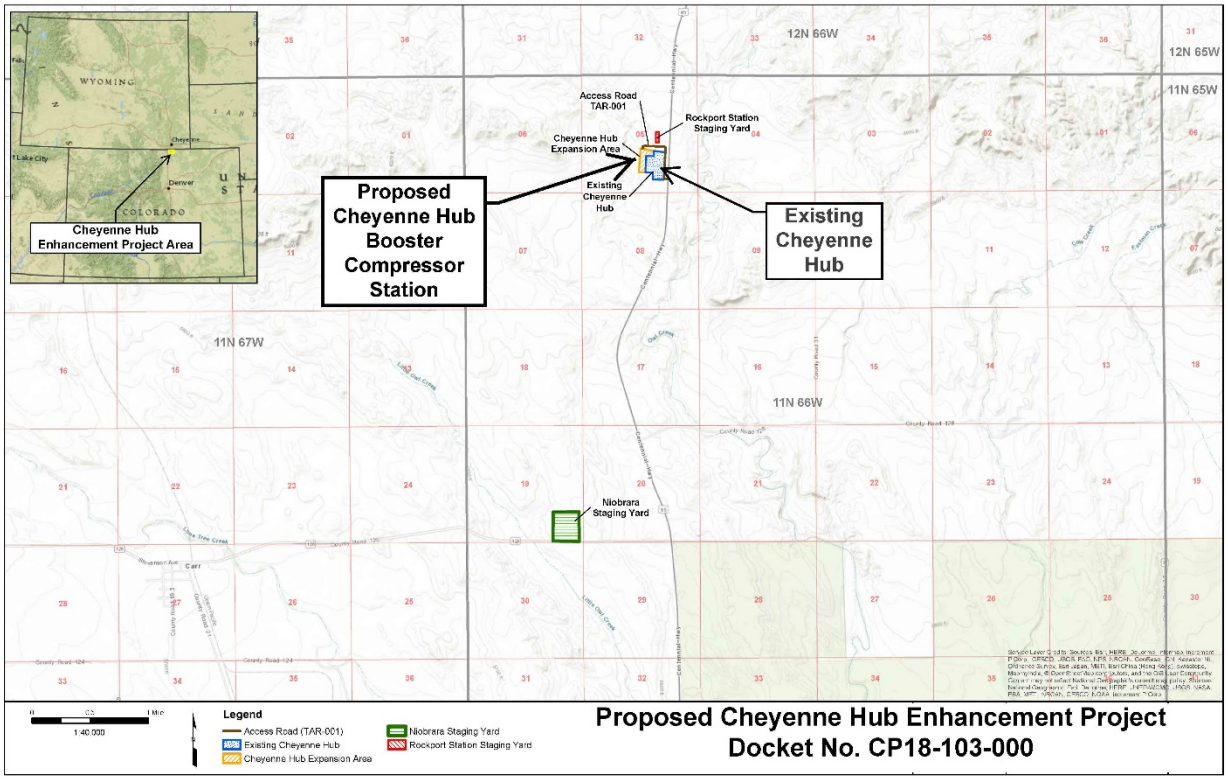

Figure 2: Cheyenne Hub Enhancement Project Overview Map

5. Construction and Operation Procedures

During construction and restoration of the Projects, the Applicants would implement the measures contained in the following plans, in addition to other federal, state, and local permit requirements:

- FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures),[4] with the exception of requested modifications to the Procedures as discussed in EA section B.3.5;
- *Spill Prevention and Response Plan* (SPRP);
- *Horizontal Directional Drill (HDD) Inadvertent Return Contingency Plan*;
- *Migratory Bird Treaty Act Conservation Plan*;
- *Noxious Weed Management Plan*; and
- *Cultural Resources Unanticipated Discovery Plan*.

[4] The FERC Plan and Procedures are a set of baseline construction and mitigation measures developed to minimize the potential environmental impacts of construction on upland areas, wetlands, and waterbodies. The Plan and Procedures can be viewed on the FERC website at: www.ferc.gov/industries/gas/enviro/plan.pdf and www.ferc.gov/industries/gas/enviro/procedures.pdf.

During construction of the pipeline and M&R facilities, Cheyenne Connector would employ a minimum of four environmental inspectors (EIs) to oversee and document environmental compliance during the construction phase. During construction of the compressor station facilities, Rockies Express would employ one EI. The EIs would have authority to stop activities that violate the environmental conditions of the Certificate or other applicable permits. Each EI would be responsible for ensuring that construction activities are in compliance with the environmental conditions imposed on the Projects. This includes the requirements of FERC's Plan and Procedures; environmental conditions of the Certificate; mitigation measures proposed by the Applicants; and the requirements of any other environmental permits and approvals. All Enhancement Project and Pipeline Project construction personnel would be informed of the authority of the EIs and would receive job-appropriate environmental training prior to commencement of work on the Projects. FERC staff would also conduct inspections of the Projects' facilities during construction and restoration to determine compliance with any conditions attached to any Certificate that FERC may issue.

The Projects would be constructed, tested, operated, and maintained in compliance with all applicable federal, state, and local laws, regulations, and requirements, further detailed in tables A-1 and A-2 in appendix A. These laws and regulations include the Natural Gas Pipeline Safety Act of 1968, as amended, the U.S. Department of Transportation's (DOT) *Transportation of Natural Gas or Other Gas by Pipeline, Minimum Federal Safety Standards* contained in 49 CFR 192, and the Commission's regulations at 18 CFR 380.15, *Siting and Maintenance Requirements*. In accordance with 49 CFR 192, the Cheyenne Hub Booster Compressor Station, Cheyenne Connector Pipeline, and associated M&R stations would be inspected for leaks as part of scheduled operations and maintenance.

5.1 Aboveground facility construction

Initial construction activities would include the clearing of existing vegetation on the approved sites. Sites would then be graded as necessary to create level surfaces and establish access for the movement of construction vehicles and prepare the area for construction activities. Clearing would be performed only to the extent necessary to provide sufficient workspaces for the installation of the compressor building, ancillary facilities, and perimeter security fencing. Installation of various erosion and sedimentation controls would begin immediately after the initial clearing of each site in accordance with site-specific stormwater pollution prevention plans.

Before the new Cheyenne Hub Booster Compressor Station is placed into service, Rockies Express would develop and implement a station commissioning plan, which would include the checking and testing of controls and safety features, including the emergency shutdown system, relief valves, gas and fire detection facilities, and other engine protection and safety devices as applicable. This plan would also include a vibration test.

5.2 Pipeline Construction

The Pipeline Project's pipeline facilities would include the 70-mile-long Cheyenne Connector pipeline as well as a 0.25-mile lateral pipeline associated with the proposed O'Connor M&R Station. The first phase of Pipeline Project construction would involve staking the pipeline centerline, construction right-of-way, and additional temporary workspaces (ATWS) to clearly delineate these areas. Following staking, tree and brush clearing would then proceed. Vegetation debris would be used by landowners for timber, mulch, or firewood, or removed from work areas and disposed of in accordance with applicable local and state requirements. To accommodate topsoil segregation described below, the Pipeline Project would require a typical 125-foot-wide construction right-of-way in upland areas, which would be reduced to 75 feet wide within wetlands and waterbodies to minimize impacts on these features. The 0.25-mile-long lateral pipeline associated with the O'Connor M&R Station would require a 100-foot-wide construction right-of-way. Typical construction cross-section diagrams are provided in appendix B.

Topsoil segregation would be performed ahead of trenching. Subsoil would be stockpiled separately from topsoil on actively cultivated or rotated croplands and pastures, residential areas, hayfields, or where required by the landowner or land management agency.

During construction, the Applicants would implement dust mitigation measures in accordance with permits issued by the Colorado Department of Public Health and the Environment (CDPHE), further described in section B.8.3.

Individual sections of pipe would be strung along the Cheyenne Connector pipeline right-of-way either before or after trenching is complete. Trenching would be accomplished through use of a backhoe or trenching machine and would keep trench spoil segregated from topsoil. The trench would be excavated to a width up to 48 inches.

If necessary, individual pipe segments would be bent using a bending machine in accordance with federally prescribed standards, before being aligned and welded together. All welds would be visually and radiographically inspected. After welding is complete, the pipe assembly would be lowered into the trench and backfilled with previously excavated soil to a depth of at least 36 inches.

After backfilling, the pipe would be hydrostatically tested in accordance with DOT regulations specified in 49 CFR 192. Cheyenne Connector would obtain all water used to perform hydrostatic testing from the following commercial, permitted sources: Wagistics LLC, New Cache La Poudre Irrigating Company, and North Weld County Water District. The water would be pumped from each of these sources to various test sections along the pipeline. Hydrostatic testing is discussed further in section B.3.2.

Within 20 days of completion of backfilling the trench, or as soon as possible, all remaining trash, debris, surplus materials, and temporary structures would be removed

from the construction right-of-way and disposed of in accordance with applicable federal, state, and local regulations. All disturbed areas would be final-graded and restored as closely as possible to preconstruction contours within the 20-day period. These restoration activities would be completed in residential areas within 10 days of backfilling. Permanent erosion control measures would also be installed during final cleanup. Topsoil previously segregated from the trench material would be spread uniformly across the construction right-of-way, and the topsoil and subsoil in agricultural areas disturbed by construction would be tested for compaction. Additional information on soil compaction and revegetation is provided in section B.2.

In addition to the standard pipeline construction methods described above, Cheyenne Connector would use special construction techniques where warranted by site-specific conditions (e.g., crossings of roads, utilities, wetlands, and waterbodies) as described below. Cheyenne Connector would minimize construction impacts by implementing the measures in FERC's Plan and Procedures.[5]

With the exception of proposed HDD construction described below, the Applicants would adhere to a typical 10-hour-per-day, 6-day-per-week construction schedule taking place primarily during daylight hours over an anticipated 7-month-long construction period. Pipeline Project construction would require approximately 580 workers (150 for the pipeline's northern spread, 250 for the pipeline's southern spread, 120 for the M&R stations, and 60 for inspections). Construction of the Enhancement Project would require approximately 150 workers.

A diagram illustrating typical pipeline construction is provided in figure 3.

[5] A complete set of alignment sheets is included in the Applicants' August 1, 2018 response to FERC's July 5, 2018 data request. See FERC Accession No. 20180802-5073.

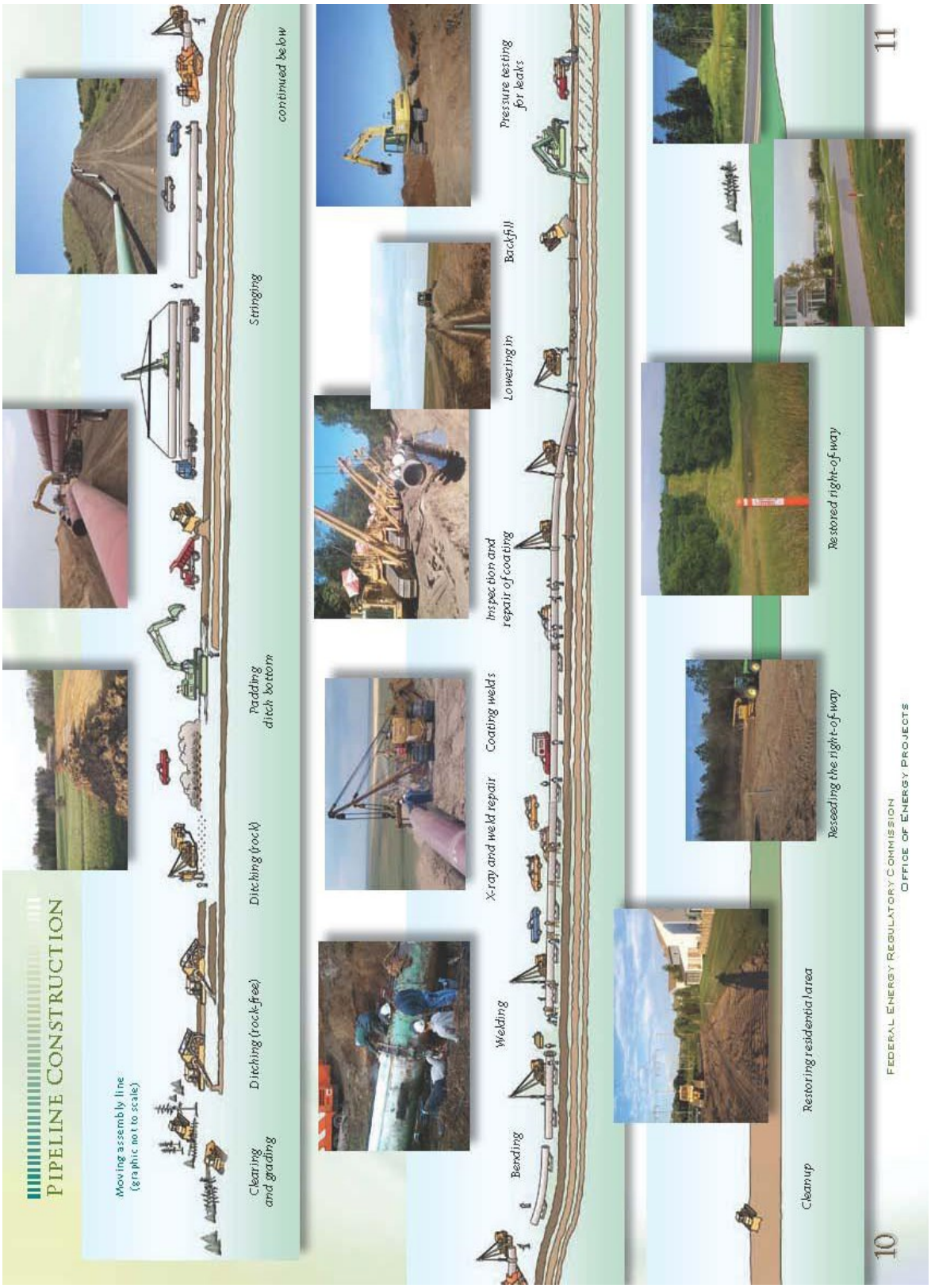

Figure 3: General Pipeline Construction Sequence

Horizontal Directional Drilling

To minimize surface disturbance and environmental impact, HDD methods would be used at certain locations where the pipeline crosses streams, waterbodies, ditches, roads, and other areas. Table 1 summarizes the lengths, locations, and anticipated drilling durations for each of the proposed HDD crossings along the Cheyenne Connector pipeline route.

Table 1
HDD Crossings

HDD Number	Milepost	HDD Crossing Name	HDD Crossing Length (feet)	Anticipated Drilling Duration (weeks)
1	13.0 – 13.2	Platte Valley Canal	1,255	4
2	13.3 – 13.6	Evans Ditch	1,325	4
3	14.6 – 14.8	Unnamed Ditch and Foreign Pipelines	1,200	3.5
4R	15.8 – 16.1	Gilmore Canal – 1	1,950	5
6	16.9 – 17.2	Weld County Road (WCR) 49	1,310	4
7	20.4 – 20.7	WCR 46 and Neres Canal	1,300	4
8	23.7– 24.0	Gilmore Canal – 2	1,400	4
9	25.3 – 25.6	Weld Road and Union Pacific Railroad	1,345	4
10	26.9 – 27.2	WCR 58 and Plum Ditch	1,498	4.5
11	28.1 – 28.6	South Platte River	3,110	7
12	28.6 – 28.9	Colorado State Highway 263 and Ogilvy Ditch	1,230	3.5
13	33.8 – 34.1	Lone Tree Creek and Foreign Pipeline	1,525	4.5
13A	34.5 – 34.7	Horse Property	885	3
14	35.1 – 35.4	Greeley Number 2 Canal	1,910	5
15	37.2 – 37.5	Farm Pond and WCR 76	1,280	4
16	37.7 – 38.0	Eaton Ditch and Foreign Pipelines	1,490	4.5
17	41.0 – 41.3	Eaton Ditch - 2	1,140	3.5
18	43.0 – 43.3	Eaton Ditch - 3	1,172	3.5

For HDD construction across waterbodies, drilling equipment would be set up at the entry point on one side of the feature to be crossed. On the other side of the feature, pipe for the crossing would be strung out and welded along the right-of-way or within an ATWS that lines up with the drill path. The pipe would be hydrotested before being pulled through the drill hole. Between the drill entry and exit points, vegetation would be cleared only to the extent necessary to allow a clean visual path for observation, access, and to lay the drilling guide line. For small stream crossings, a temporary bridge may be

constructed along the right-of-way to allow equipment travel between the entry and exit points. The HDD profile (depth and length) would be designed based on site-specific conditions to minimize the risk of an inadvertent return of drilling mud from the drill path to the surface. If an inadvertent return occurs within jurisdictional waters or wetlands, Cheyenne Connector would notify the U.S. Army Corps of Engineers (USACE) and the FERC as soon as possible and coordinate response activities with the USACE.

The proposed HDDs including Cheyenne Connector's trenchless risk analysis for each HDD are further discussed in section B.1. The potential for the proposed HDDs to result in noise impacts at nearby noise sensitive areas (NSA), including residences, is discussed in section B.9.2.

Boring

Cheyenne Connector would perform boring activities along the Cheyenne Connector pipeline right-of-way to cross approximately 147 roads, canals, railroads, and water features. Remaining road crossings along the right-of way would be open-cut. Cheyenne Connector has not provided an updated table for finalized Project modifications that lists all proposed road, railroad, and canal crossings by milepost. Therefore, **we recommend that**:

- **Prior to construction, Cheyenne Connector should file an updated table of all proposed road, railroad, and canal crossings by milepost for the Pipeline Project.**

Waterbody Construction

Cheyenne Connector would use different crossing techniques for waterbodies, depending on the type of waterbody traversed, further described in section B.3.2. Non-flowing and intermittent and ephemeral streams would be open-cut. A "wet," or open-cut, crossing involves trenching and installing the pipeline without isolating the construction work area from stream flow. The objective of this method is to complete the crossing as quickly as practical to minimize the duration of impacts on aquatic resources. A "dry-ditch" crossing involves isolating the construction work area from the stream flow by directing water through a flume pipe placed above the pipeline trench (flume crossing) or by damming and pumping the water around the construction area (dam-and-pump crossing). The primary objectives of these methods are to minimize turbidity, siltation, and downstream impacts on aquatic resources. An HDD crossing avoids all direct impacts on the waterbody and adjacent banks.

Cheyenne Connector would adhere to the FERC's Procedures to limit water quality and aquatic resource impacts during and following construction. In accordance with FERC's Procedures, the duration of construction of open-cut crossings would be limited to 24 hours across minor waterbodies (10 feet wide or less at water's edge) and 48 hours across intermediate waterbodies (between 10 and 100 feet wide at water's edge).

Construction activities would be scheduled so that the pipeline trench is excavated immediately prior to pipe-laying activities.

If the stream or ditch is dry at the time of construction, Cheyenne Connector would cross the stream by standard upland crossing techniques. However, all materials required to cross a stream using a flume or dam-and-pump method would be on site in the event of a weather change and the stream begins to flow.

An open-cut waterbody crossing is typically conducted using methods similar to conventional upland construction and does not isolate stream flow from the construction activities. The open-cut construction method involves excavation of the pipeline trench across the waterbody, installation of a prefabricated segment of pipeline, and backfilling of the trench with native material. Depending on the width of the crossing and the reach of the excavating equipment, excavation and backfilling of the trench would generally be accomplished using backhoes or other excavation equipment operating from one or both banks of the waterbody. If necessary for reach, the equipment may operate within the waterbody. Equipment in the waterbody would be limited to that needed to complete the crossing.

The flume crossing method involves temporarily directing the flow of water through one or more flume pipes placed over the area to be excavated. This method allows excavation of the pipe trench across the waterbody completely beneath the flume pipes without disrupting water flow in the stream. Stream flow is diverted through the flumes by two bulkheads, constructed using sand bags or plastic dams, to direct the stream flow through the flume pipes. Following completion of pipeline installation, backfilling of the trench, and restoration of stream banks, the bulkheads, and flume pipes would be removed. This crossing method generally minimizes the duration of downstream turbidity by allowing excavation of the pipeline trench under relatively dry conditions.

The dam-and-pump method involves the installation of temporary dams upstream and downstream of the waterbody crossing location. Temporary dams are typically constructed using sandbags, and appropriately sized pumps are used to dewater and transport the stream flow around the construction work area and trench. Cheyenne Connector would install intake screens on the pump inlets to prevent entrapment of aquatic life, and energy-dissipating devices would be installed at the pump discharge point to minimize erosion and stream bed scour. Trench excavation and pipeline installation would then commence through the dewatered portion of the waterbody channel. Following completion of pipeline installation, backfilling of the trench, and restoration of stream banks, the temporary dams would be removed and water flow through the construction work area would be restored. This method is generally appropriate only for those waterbody crossings where pumps can adequately transfer the stream flow volume around the work area and there are no concerns about the passage of sensitive aquatic species.

5.3 Contractor Yards, Additional Temporary Workspaces, and Access Roads

Several contractor yards and ATWSs would also be required for construction of the Projects tabulated in section B.5 and appendix C, respectively. The Applicants would clear, grade, and level each of these areas as needed. For transport of construction vehicles, existing public roads would be used wherever possible. Existing roads may require improvements such as grading and/or graveling. A total of 91 temporary access roads (TARs) and 9 new permanent access roads (PARs) would be required for construction and operation of the Projects. Of the 91 TARs, 63 would be constructed on existing gravel or dirt lanes and 28 would be new roads constructed either partially or fully within crop land or grass fields. All TARs and PARs would be graded to a width of 50 feet, requiring the widening of many of the existing roads utilized.

5.4 Project Restoration and Operation

Cleanup and restoration procedures would be initiated as soon as possible after backfilling or completion of construction of surface facilities. Final cleanup typically involves a series of steps, including off-site waste material management and equipment removal. Restoration operations involve surface grading and the reestablishment of natural contours and vegetation.

Surplus materials from construction activities would generally be removed and disposed off-site. The surface of the right-of-way would be graded to conform to pre-existing contours of the adjoining area. Within upland areas, a slight crown of soil would be formed over the trench to account for subsidence. After natural contours are restored, the corridor would typically be final-graded. Non-cultivated lands would be re-seeded as soon as possible to minimize erosion.

For re-seeding of disturbed areas, the Applicants would use a seed mix approved by the local Natural Resources Conservation Service (NRCS) or as requested by the landowner. Revegetation would be accomplished in a manner compatible with preconstruction and adjacent vegetation patterns, in accordance with the FERC Plan. To the extent possible, streambeds would be returned to preconstruction contours, and stream and river banks would be restored to preconstruction condition and allowed to revegetate in accordance with the FERC Procedures. Cheyenne Connector would conduct periodic aerial and ground inspections of the Cheyenne Connector pipeline right-of-way and implement additional restoration measures if necessary. The Applicants would return all completed construction areas to their original condition as closely as practicable, and fences would be repaired as needed.

6. Construction Schedule

Construction of both Projects, if approved, is anticipated to begin in April 2019 with an in-service date of October 2019.

7. Land Requirements

The Projects, in total, would affect approximately 1,723.0 acres during construction. Approximately 469.5 acres would be required for the permanent pipeline right-of-way and operational footprints for the new compressor station and M&R stations. All disturbed areas not used for operation of the Projects' facilities would be returned to pre-construction conditions. Land requirements for each Project are summarized in tables 2 and 3. Land use requirements are itemized in further detail within section B.6.

Table 2
Land Requirements for the Enhancement Project (acres)

Project Facility	Land Disturbed for Construction – Temporary	Land Required for Operation – Permanent
existing Cheyenne Hub footprint	20.5	20.5
Cheyenne Hub expansion area	9.0	9.0
staging yards	37.8	1.6
access roads	3.2	0.0
Total	**70.5**	**31.1**

Table 3
Land Requirements for the Pipeline Project (acres)

Facility	Land Disturbed for Construction – Temporary	Land Required for Operation – Permanent
Cheyenne Connector Pipeline	1,042.1	429.3
O'Connor lateral pipeline	2.4	1.6
ATWSs	218.2	0.0
M&R stations including O'Connor M&R Station pig receiver	15.3	4.5
mainline valves	0.3	0.3
contractor yards	228.2	0.0
access roads (TARs and PARs)	146.0 a/	2.7
Total	**1,652.5**	**438.4**

a/ Acreage consists of total area of TARs and PARs cleared and graded, including the area of existing roads and the additional area required to widen existing roads to 50 feet.

8. Non-Jurisdictional Facilities

Under Section 7 of the NGA, the Commission is required to consider, as part of its decision to authorize jurisdictional facilities, all factors bearing on the public convenience and necessity. The primary jurisdictional facilities for the Projects are the proposed compressor station including the compressor unit, compressor and auxiliary buildings, inlet and outlet piping, and other supporting facilities necessary to operate the compressor station, pipeline, and M&R stations.

Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the Commission. These non-jurisdictional facilities may be integral to the need for the proposed facilities (e.g., a natural gas-fired power plant at the end of a jurisdictional pipeline) or they may be minor, non-integral components of the jurisdictional facilities that would be constructed and operated as a result of the proposed facilities.

Non-jurisdictional facilities required for the proposed Pipeline Project facilities are summarized in table 4.

Table 4
Non-Jurisdictional Facilities Required for the Pipeline Project

Project Facilities	Required Non-Jurisdictional Facilities	Non-Jurisdictional Facility Provider
Lancaster M&R Station	electric meter rack and meter	United Power
Latham and Mewbourn M&R Stations; MLV #3	electric pole outside each facility's fence line, and a new service drop, electric meter, and meter rack for each facility	Xcel Energy
O'Connor M&R Station	approximately 1,500 feet of aboveground power line, associated power poles, and electric meter rack and meter	Poudre Valley Rural Electric Association
MLV #1	approximately 48 feet of underground conduit and electric meter	Poudre Valley Rural Electric Association
MLV #2	approximately 600 feet of power line, three pole drops, service drop, electric meter, and meter rack	Xcel Energy

The Enhancement Project would not require the construction of any non-jurisdictional facilities, and would utilize power infrastructure at the existing Cheyenne Hub.

Impacts associated with the non-jurisdictional facilities are further discussed in our cumulative impacts section (B.11).

9. Public Review and Comment

On May 3, 2018, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Cheyenne Connector Pipeline and Cheyenne Hub Enhancement Projects and Request for Comments on Environmental Issues* (NOI). The NOI was sent to affected landowners; federal, state, and local government agencies; elected officials; environmental and public interest groups; Native American tribes; other interested parties; and local libraries and newspapers.

In response to our NOI, the Commission received comments from DCP Midstream; Teamsters National Pipeline LMCP; Colorado Interstate Gas Company, L.L.C. (CIG); Anadarko, Cheyenne Connector, LLC; HLT Farms, LLLP; the Town of Kersey; two Native American tribes; and eight individuals. Table 5 summarizes the primary environmental issues raised within the comments received concerning the proposed Projects and indexes the section within this EA where each comment is addressed.

Table 5
Summary of Comments Received during Scoping for the Projects

Comment/Concern	Section addressing Comment
Pipeline Project construction affecting the Irons Lateral Ditch	B.3.2
cultural resources	B.7
soils	B.2
impacts on agricultural lands	B.2; B.5
easement negotiation process	B.6.5
water quality	B.3
air quality	B.8
property values	B.6.5
public safety	B.10
climate change	B.11
cumulative impacts (Town of Kersey)	B.11
CIG System Alternative	C.2
requested route variations	C.3

We also received general comments concerning the development of jurisdictional and non-jurisdictional natural gas facilities in Weld County. These comments are noted and included within the list of past, present, and reasonably foreseeable actions addressed in our cumulative impacts analysis in section B.11.

10. Permits

A number of federal, state, and local regulatory agencies have permit or approval authority or consultation associated with the proposed Projects. Appendix A provides a list of permits and consultations necessary for the Projects, the applicable local, state, and federal agencies, as well as any responses received to date. The Applicants would be responsible for obtaining all permits and approvals required for construction and operation of the Projects, regardless of whether or not they appear in the tables.

B. ENVIRONMENTAL ANALYSIS

The following sections discuss the Projects' potential direct and indirect impacts on environmental resources. When considering the environmental consequences of the proposed Projects, 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 return to pre-construction conditions. Permanent impacts occur when activities modify resources to the extent that they would not return to pre-construction conditions during the life of the Projects, 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.

1. Geology

1.1 Physiographic Setting and Geologic Conditions

Portions of the proposed Projects including the entirety of the Enhancement Project facilities and the northern part of the Pipeline Project (including the Cheyenne Connector M&R Station) are in the High Plains subprovince of the Great Plains physiographic province, which consists of younger exposed terrain raised by regional uplift and covered by windblown sand and silt (Trimble, 1980). The surficial geology underlying these proposed Pipeline and Enhancement Project facilities consists primarily of unconsolidated sand and pebbles from locally fragmented Tertiary bedrock (U.S. Geological Survey [USGS], 2008).

The remaining facilities, all associated with the southern part of the Pipeline Project, are in the Colorado Piedmont subprovince of the Great Plains physiographic province, which consists primarily of easily erodible Upper Cretaceous shale, sandstone, and Tertiary arkose (Scott, 1965). The surficial geology underlying the southern portion of the proposed Pipeline Project facilities consists primarily of residual sediments and exposures of the Laramie and White River Formations in the northern part of this segment of the pipeline, Quaternary gravels and alluviums near the South Platte River, and eolian deposits east of the South Platte River (Colton, 1978; Hanson, 1920; and Holliday, 1994).

Cheyenne Connector performed geotechnical studies to evaluate subsurface soil and groundwater conditions at the proposed HDD locations and to determine the feasibility of the HDDs. On August 2, 2018, Cheyenne Connector filed supplemental information to its Pipeline Project application containing a summary of route changes, including HDD modifications/additions. Cheyenne Connector has not yet provided the results of geotechnical investigations for these modifications/additions. Therefore, **we recommend that**:

- **<u>Prior to construction</u>, Cheyenne Connector should file with the Secretary of the Commission (Secretary) copies of all geotechnical investigation results from the relocated and/or additional HDD locations (i.e., HDD #4R, HDD #11, and HDD #13A) including boring locations, lithologic logs, standard penetration tests, and bedrock quality designations. Cheyenne Connector should also file an updated Trenchless Risk Analysis, for review and written approval by the Director of the Office of Energy Projects (OEP), which should include a description of:**

  a. the likelihood of success for each drill;

  b. any subsurface conditions that were identified as a result of geotechnical investigations that may increase the risk of HDD complications (e.g., unplanned inadvertent returns, drill hole collapse, contamination). Quantify the potential for hydraulic fracture and an inadvertent release using the USACE's Delft method (or an equivalent method) for crossings through unconsolidated material, and/or a qualitative analysis for crossing through bedrock utilizing rock quality designation values obtained from bedrock cores; and

  c. include the measures that would be implemented to minimize the risk of HDD complications.

1.2 Mineral and Non-Mineral Resources

Based on a literature review, four inactive mine shafts, one inactive coal mine, and one active sand and gravel mine (USGS, 2017; Colorado Division of Reclamation, Mining, and Safety, 2014) were identified within 0.25 mile of the Pipeline Project. The active sand and gravel mine is approximately 1,200 feet from the Pipeline Project right-of-way. Numerous (over 700) active and abandoned oil and gas wells are within 0.25 mile of the Pipeline Project route (Colorado Oil and Gas Conservation Commission, 2017). Cheyenne Connector would coordinate with the well owners to avoid adverse impacts on production and transportation of oil and gas. Based on the proposed pipeline route, Cheyenne Connector's adherence to the FERC Plan and Procedures, and the Applicants' SPRP as further described in section B.3.2 below, we conclude there would not be a significant impact on mineral resources.

1.3 Geologic Hazards

Geologic hazards are natural physical conditions that can, when present, result in damage to land and structures or injury to people. Potential geologic hazards in the Projects' areas were determined through database searches and literature and topographic map reviews, and include seismicity (earthquakes and faults), slope stability and landslides, subsidence, flooding/scour, soil liquefaction, soil expansion, and volcanism. The proposed sites for the Projects are not characterized by volcanic or karst conditions,

or susceptible to landslides; thus, the Projects would not be affected by such hazards. Applicable seismic hazards and flooding are discussed below.

Seismic Hazards

Seismic hazards include earthquakes, ground faulting, and secondary effects such as soil liquefaction. The Projects areas are considered to be a "Low" to possibly "Moderate" Earthquake Hazard Zone with little historical seismicity. The USGS earthquake hazard program mapping shows that seismicity in terms of peak ground acceleration within the Projects' areas is between 6 to 10 percent gravity for the 2-percent probability of return period in 50 years (USGS, 2014). These values represent light ground shaking with little to no associated damage, and low potential for soil liquefaction to occur. In addition, saturated soils that could contribute to soil liquefaction are not likely to be present in the Projects' vicinity. As such, we do not anticipate seismic-related impacts on the Projects.

Flooding

Flooding (like shallow groundwater) can cause buoyancy in pipelines. Flooding can also induce lateral migration of streams and cause scour that can undermine or expose a pipeline. The Pipeline Project would cross two Federal Emergency Management Agency (FEMA) Flood 100-year flood zones. The Cheyenne Connector pipeline would be installed below the ground surface, and the surface of the right-of-way restored and stabilized following construction which would minimize environmental impacts and modification of floodplains.

1.4 Paleontology

The Projects' areas are underlain by shale, claystone, and sandstone beds of the Laramie and Denver Formations that have the potential to contain diverse fossils, including dinosaur, fish, amphibian, mammal, and several turtle species (Carpenter, 1979). The Projects' areas are also underlain by the White River Formation which contains late Eocene and Oligocene vertebrate, invertebrate, and plant fossils. If unique or significant fossil specimens are discovered during excavation activities, the Applicants would cease construction activities and consult with the appropriate county or Colorado State paleontological specialist.

Given the geologic conditions within the Projects' areas and the Best Management Practices (BMPs) included in the FERC Plan and Procedures and the Applicants' SPRPs, we do not anticipate that Projects' facilities would be compromised due to geologic hazards and that the proposed facilities would not result in significant impact on geologic or paleontological resources.

2. Soils

Information regarding the soil types and characteristics occurring in the Projects' areas was obtained from the NRCS Soil Survey Geographic database (NRCS, 2014), which provides detailed information useful for natural resource planning and management.

Construction activities such as clearing, grading, excavation, backfilling, heavy equipment traffic, and restoration activities could result in adverse impacts on soil resources in temporary workspaces, on access roads, and at aboveground facilities. Clearing would remove protective vegetation cover and would expose soils to the effects of wind, sun, and precipitation, which could increase soil erosion and the transport of sediment to sensitive areas such as waterbodies or dry washes (also referred to as ephemeral washes). Grading and equipment traffic could compact soil, reducing porosity and percolation rates, which could result in increased runoff potential. Soil contamination from equipment spills and/or leakage of fuels, lubricants, and coolants could also impact soils. Certain practices, such as the use of FERC's Plan and Procedures and the Applicants' SPRPs would help adequately minimize impacts on soils.

The U.S. Department of Agriculture defines prime farmland soils as those that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. Prime farmland soils can include either actively cultivated land or land that is potentially available for cultivation. Farmland that does not meet the criteria for prime farmland may still be considered farmland of statewide importance for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the local conservation districts. Generally, this land includes soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Approximately 598 acres of the soils temporarily impacted by the Projects' activities are considered prime farmland, farmland of statewide importance, and farmland of local importance. Of this, about 4.5 acres would be permanently converted from prime farmland to industrial use.

Soil erosion would be mitigated through temporary erosion and sedimentation control measures and implementation of permanent measures in accordance with the FERC Plan. The FERC Plan contains measures to facilitate revegetation of those disturbed areas that would revert to pre-construction condition. As described in section A.5.2, the Applicants would perform topsoil segregation, where applicable, to aid in topsoil conservation and revegetation of temporary work areas and thereby minimize the disturbance of undeveloped lands.

Parts of the proposed Projects involve construction in general proximity to areas of known contamination. The Applicants acquired an Environmental Data Resources, Inc. database search report for the Projects' areas. According to the report, no reported

instances of contaminated soils have been reported within 0.25 mile of the Projects' proposed facilities. Therefore, no effect from contaminated soil is anticipated. Should the Applicants encounter unanticipated contaminated soils during construction, they would evaluate and treat impacted soils in accordance with the SPRPs and applicable federal and state requirements.

Given the impact minimization and mitigation measures described in FERC's Plan and the Applicants' SPRPs, we conclude that soils would not be significantly affected by construction and operation of the Projects.

3. Water Resources and Wetlands

3.1 Groundwater Resources

Groundwater resources within the Projects' areas are found in the High Plains and Denver Basin aquifer systems. The High Plains aquifer system is a large-scale (multi-state) regional aquifer system formed in Quaternary and Tertiary sediments and bedrock. The Denver Basin is a smaller aquifer system formed in Cretaceous and Tertiary sandstone, conglomerate, and shale. Groundwater recharge is derived from precipitation in the highlands surrounding the basins, or seepage from intermittent and ephemeral surface flow (USGS, 1995). Based on the geotechnical investigations, depth to groundwater ranges from less than 10 feet to over 35 feet below ground surface across the Projects' areas.

Sole-Source Aquifers and Protected Aquifers

Under Section 1424(e) of the Safe Drinking Water Act, the U.S. Environmental Protection Agency (EPA) defines a sole or principal source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer, and for which there are no other reasonably available alternative drinking water source(s) that could physically, legally, and economically supply all those who depend on the aquifer for drinking water should the aquifer become contaminated. None of the Projects' areas are within sole-source aquifers (EPA, 2018). No wellhead protection areas or other protected groundwater sources are within 0.5 mile of the Projects' areas (Colorado's Decision Support Systems [CDSS] Colorado Division of Water Resources [CDWR], 2017).

Water Supply Wells and Springs

According to the CDSS CDWR (2017) and field surveys, no seeps or springs are within 150 feet of the Projects' areas.

Forty-six potentially active groundwater wells, two abandoned wells, and three wells with an unknown status were identified within 150 feet of the Projects' areas. Of the potentially active and unknown status wells, 4 were listed as commercial, 21 were listed as domestic and/or stock, 6 were listed as monitoring wells, and 18 were listed as

irrigation wells. Of these, 14 wells are within the Pipeline Project construction right-of-way or workspaces (CDSS CDWR, 2017).

Groundwater Contamination

The proposed Projects involve construction in general proximity to areas of known contamination. According to the Environmental Data Resources, Inc. report discussed in section B.2, no reported instances of contaminated groundwater have been reported within 0.25 mile of the Projects' facilities. Therefore, no effect from contaminated groundwater is anticipated. Should the Applicants encounter unanticipated contaminated groundwater during construction, they would evaluate and treat impacted groundwater in accordance with the SPRPs and applicable federal and state requirements.

Pipeline and related infrastructure construction necessitates the use of heavy equipment and associated fuels, lubricants, and other potentially hazardous substances that, if spilled, could affect shallow groundwater and/or aquifers. Accidental spills or leaks of hazardous materials associated with vehicle fueling, vehicle maintenance, and material storage would present the greatest potential contamination threat to groundwater resources. If not properly addressed, soil contamination resulting from these spills or leaks could continue to add pollutants to the groundwater for some period after the spill occurred.

Groundwater Impacts and Mitigation

Construction activities, including clearing, trench excavation, dewatering, and fuel handling, could affect groundwater in several ways. Clearing and grading would remove vegetation that provides filtration and slows surface runoff. Trenching and soil stockpiling activities would temporarily alter overland flow and groundwater recharge and could alter near-surface groundwater flows where shallow groundwater is encountered. Heavy equipment used for construction could compact the soil along the right-of-way and slow groundwater recharge rates. Shallow groundwater could also affect the buoyancy of the pipe, increase the potential for pipe corrosion, and cause sidewall instability during construction. In the event groundwater was to infiltrate into the excavated areas, dewatering could result in localized, minor changes in the water table. The Applicants would coordinate with well owners and offer pre- and post-construction testing in order to document water quality and flow for all active wells within 150 feet of the Projects' areas. If testing revealed that impacts on a well occurred as a result of construction of either of the Projects, the Applicants would coordinate with the well owner to provide a temporary source of water and repair or replace the impacted well.

Effects from construction would likely be temporary, and the groundwater system would recover to equilibrium within a period of days to a few months. Implementation of proper storage, containment, and handling procedures would effectively minimize the chance of spills or leaks of hazardous materials associated with vehicle fueling, vehicle

maintenance, and material storage. Other groundwater impacts during construction would be effectively minimized or avoided by implementing construction practices outlined in FERC's Plan and Procedures and the Applicants' SPRPs.

3.2 Surface Water Resources

Pipeline Project

The Pipeline Project area is within the Crow subwatershed (USGS Hydrologic Unit Code [HUC] 8 – 10190009) and the Middle South Platte – Cherry Creek watershed (HUC 8 - 10190003. Cheyenne Connector conducted a survey of surface waterbodies within the Project area in from October 2017 through February 2018.

The Pipeline Project would cross 67 waterbodies (22 via HDD, 23 via conventional boring, and 22 via open cut. Cheyenne Connector would cross waterbodies using one of the following methods: open-cut (wet-trench) or flume or dam-and-pump (dry-ditch) depending on the conditions encountered in the field; and HDD and direct boring for perennial streams, as well as for some intermittent streams and ditches.

Six waterbodies are within ATWSs, and one waterbody is within the Eaton Rail/Storage Yard. A full summary of waterbodies crossed by the Pipeline Project is provided in appendix D.

For open-cut or dry-ditch crossings, trench spoil is required to be stored at least 10 feet from the stream banks (topographic conditions permitting), per the Procedures. Sediment barriers, such as silt fence and staked straw bales, are then installed to prevent spoil and sediment-laden water from entering the stream. FERC's Procedures require that open-cut crossings be completed and backfilled within 24 hours for minor water bodies (less than 10 feet wide) and within 48 hours for intermediate waterbodies (10 to 100 feet wide).

The Pipeline Project would cross the watersheds of two impaired sections of the South Platte River that are currently on Colorado's 303(d)[6] List of Impaired Waters. The first section runs from below the confluence of the South Platte River and St. Vrain Creek to the Weld/Morgan County line and is impaired because of elevated levels of *Escherichia coli (E. coli)*, arsenic, and manganese. The Pipeline Project would also briefly cross the watershed for Town of Platteville-South Platte River Watershed, which is impaired because of elevated levels of *E. coli* and nitrate (NO_3). A total maximum daily load study is required for both sections. No other streams or watersheds crossed by the Pipeline Project are listed as impaired by the CDPHE (CDPHE, 2016). Waterbodies such as the South Platte River, its associated tributaries, and Lone Tree Creek are listed

[6] Section 303(d) of the Clean Water Act requires states to submit to the EPA a list of waters for which technology-based effluent limitations and other required controls are not stringent enough to implement water quality standards.

as Class 2 warmwater fisheries in the Pipeline Project area. The South Platte River is classified as an existing primary contact use recreation stream.

The Pipeline Project would not cross or otherwise impact any waterbodies designated as a National Wild and Scenic River (National Wild and Scenic Rivers System, 2017). No known surface water intakes were identified within 3 miles downstream of surface water crossings associated with the Pipeline Project (CDSS, 2017; NWCWD, 2017; City of Greeley, 2017).

Additionally, no Superfund sites are listed for Weld County, Colorado (EPA, 2017). Cheyenne Connector conducted a desktop review and on-site observation that indicated no contaminated sediments were identified within stream segments crossed by the proposed Pipeline Project.

Water Resources Impacts and Mitigation Measures

Construction of the Pipeline Project across or near waterbodies has the potential to result in short-term and minor direct impact on waterbodies from open cutting the waterbody, construction adjacent to stream channels, the clearing and grading of adjacent lands and streambanks, trench dewatering, from the unanticipated releases of drilling mud during HDD operations, and chemical contaminants including fuels and lubricants. Construction activities could result in temporary modification of aquatic habitats through indirect impacts such as increased erosion, sedimentation and/or turbidity, and decreased dissolved oxygen concentrations, particularly within or near flowing surface waters.

To minimize impacts on waterbodies, Cheyenne Connector would use the dry-ditch crossing method and HDD and direct boring on most waterbodies to avoid and minimize the potential for impacts on surface water. Construction practices would follow FERC's Plan and Procedures, which contain BMPs intended to further reduce ground disturbance, minimize erosion and sediment run-off and promote revegetation within the construction area.

During construction, clearing vegetation cover, grading, and trenching could increase erosion. Compaction of soils by heavy equipment near waterbodies accelerate erosion and the transportation of sediment carried by stormwater runoff into the waterbodies, or into nearby waterbodies. To minimize erosion, Cheyenne Connector would implement the FERC Procedures, which includes standard measures to protect water resources, including:

- installing erosion and sediment controls immediately following initial soil disturbance where required;
- inspecting and maintaining erosion and sediment controls throughout the duration of construction and restoration;
- repairing or replacing erosion and sediment controls within 24 hours of identifying deficiencies; and

- restoring temporary disturbance areas to pre-construction contours and drainage patterns.

Because a dry-ditch crossing allows for trenching and backfill activities to occur under relatively dry conditions, it minimizes the re-suspension of polluted sediments, limits downstream sedimentation, and avoids disruption to water flow (which minimize impacts on downstream fish). Temporary construction-related impacts would be limited primarily to short periods of increased turbidity (during the assembly of the upstream and downstream dams before trenching begins, and following installation of the pipe when the dams are removed and flow across the restored work area is re-established).

Cheyenne Connector also plans to cross some ephemeral and intermittent waterbodies by open-cut, depending on the conditions encountered in the field. This technique is used because the potential impacts on water quality of open-cutting minor streams is typically not significant. Where streams are substantial (carry significant flow) and contain sensitive resources or have other valued attributes, alternative dry-crossing or HDD methods would be used to avoid or mitigate potential impacts.

If the waterbody contains flowing water at the time of construction, the primary impacts would be limited to turbidity and sedimentation. Given the flow regimes of ephemeral and intermittent waterbodies, these impacts would be limited in duration and extent, and not be considered significant. Nevertheless, Cheyenne Connector would conduct all minor stream crossing activities (trenching, pipeline installation, backfill, and streambed contour restoration) within 24 hours, thereby limiting the duration of active stream disturbance. Any intermediate waterbodies (10 to 100 feet wide) to be open-cut would be crossed in 48 hours unless site-specific conditions make completion infeasible.

Cheyenne Connector would cross 45 waterbodies using the HDD or conventional bore method, which generally avoids and greatly minimizes the potential for surface water impacts resulting from erosion, sedimentation, and/or excess turbidity by avoiding ground surface disturbance in and immediately adjacent to the waterbody. HDD and conventional bore also avoids disturbance to the bed and banks of waterbodies and minimizes ground disturbance to streams and the land surface between the entry and exit points of the crossing. ATWSs would be located on either side of the waterbody feature to accommodate the entry and exit locations of the HDDs and bores.

The execution of the HDD method requires the use of drilling mud under pressure, and the potential exists for an inadvertent release of drilling mud. Cheyenne Connector has prepared a *HDD Inadvertent Return Contingency Plan* (appendix E) that outlines specific procedures and methods for addressing an inadvertent release of drilling mud. This plan includes procedures for monitoring, detection, isolating, stopping, and clean-up of inadvertent releases, as well as making necessary agency notifications. Cheyenne Connector would use BMPs and drilling methods to limit the potential for an inadvertent return. Such practices include the contractor taking care such that penetration rates will

not exceed the rate of cuttings removal from the hole, maintaining proper drilling fluid properties to clean the hole and not allow excess solids to build up in the drilling fluid, and maintaining drilling fluid returns at all times during the pilot hole, hole opening, and pullback processes. Containment materials, such as hay bales, silt fence, and/or sand bags would be deployed in the event an inadvertent release occurs in the waterbody or wetland. Berms may also be constructed as needed to prevent release of materials from flowing into a waterbody or wetland. We have reviewed this plan and find that impacts on waterbodies due to an inadvertent release would be minimized to the extent practicable.

To minimize the risk of potential fuel or equipment fluid spills, as stated in section A.5, Cheyenne Connector has developed an SPRP, which would be implemented throughout the duration of construction. Hazardous materials, chemicals, lubricating oils, and fuels used during construction would not be stored within 100 feet radius of waterbodies. No equipment would be parked and/or refueled within 100 feet of waterbodies without the coordination of the Lead EI and implementation of additional precautions such use of secondary containment structures.

Precipitation and/or the seepage of groundwater can necessitate the dewatering of trenches and other excavated areas. During dewatering, water would be pumped from the trench or excavated area and discharged into a well-vegetated upland area. If water must be discharged to a surface water body, appropriate filtration systems would be used to control any potential increase in total suspended solids. All of the proper notifications and permits would be obtained for any planned surface water body discharges.

Once construction is completed, Cheyenne Connector would restore disturbed construction work areas to match pre-construction contours and drainage patterns. All disturbed areas would be seeded using seed mix and seeding rates as developed through consultation with the NRCS. Temporary erosion controls would remain in place until sufficient vegetation re-establishes on the Project sites. Cheyenne Connector would construct its facilities in accordance with the regulations and requirements of applicable permits such as USACE authorizations under Section 404 of the Clean Water Act, National Pollutant Discharge Elimination System stormwater discharge permit, and Hydrostatic Test Water Discharge Permit. Cheyenne Connector submitted its notification to USACE indicating its intent to construct the Pipeline Project in accordance with the USACE's Nationwide Permit 12. Based on these measures, we conclude impacts on waterbodies would be short-term and not significant.

We received comments from William T. Klein and HLT Farms, LLLP requesting that Cheyenne Connector enter an agreement with Mr. Klein and other owners of the Irons Lateral Ditch concerning a crossing method for the proposed Pipeline Project that involves placement of the pipeline under the ditch. Cheyenne Connector has not

provided information to indicate whether an agreement has been reached with these owners.

Hydrostatic Testing

In accordance with DOT regulations, Cheyenne Connector would conduct hydrostatic testing for the new pipeline prior to placing it into service to ensure it is capable of operating at the design pressure. The pipeline would be tested in eight sections. Hydrostatic test water would be obtained from three sources: Wagistics, New Cache La Poudre Irrigation Company, and North Weld Irrigation District. These three sources are existing permitted sources for which the withdrawal (water rights) have already been accounted. Cheyenne Connector would use approximately 4 million gallons of water for hydrostatic testing of the Cheyenne Connector Pipeline.

The water in the pipe would be pressurized and held for a minimum of 8 hours and would not contain any chemical additives. If any leaks are detected Cheyenne Connector would repair the piping segments and retest. Upon completion of the hydrostatic test, water would be discharged into an upland area in accordance the hydrostatic test water discharge permits issued by the CDPHE, to include discharge of test water using energy dissipation devices (e.g., straw bale dewatering structures lined with geotextile fabric) to reduce the velocity of the discharged water, thereby reducing the potential for erosion where the water is discharged.

Impacts from the withdrawal and discharge of test water would be minimized by following the requirements specified in the state hydrostatic test water discharge permits. Impacts from the withdrawal and discharge of hydrostatic test water would be short-term and not significant.

Enhancement Project

The Enhancement Project area is within the Lone Tree-Owl watershed (USGS Hydrologic Unit Code [HUC] 8 – 10190008. On October 31, 2017, Rockies Express conducted a survey of surface waterbodies within the proposed expansion area to the west of the fence line of the Cheyenne Hub, the Rockport Station Staging Yard, and the Niobrara Staging Yard within the Project area. No waterbodies were identified in the survey area for the proposed Enhancement Project; therefore, this Project would not have impacts on waterbodies. The nearest stream to the Enhancement Project that is listed in the state Integrated Water Quality Monitoring and Assessment Report[7] is Lone Tree Creek (CDPHE, 2016), which is approximately 3 miles from the Niobrara Staging Area and more than 5 miles from the Cheyenne Hub. Therefore, the Enhancement Project would not have impacts on impaired waters.

[7] Colorado's Integrated Water Quality Monitoring and Assessment Report fulfills its Clean Water Act Section 305(b) responsibilities, requiring all states to assess and report on the quality of waters within their state.

Hydrostatic Testing

In accordance with DOT regulations, Rockies Express would conduct hydrostatic testing for all newly constructed facility piping prior to placing it into service to ensure it is capable of operating at the design pressure. Testing of the piping would require approximately 355,145 gallons of water. Hydrostatic test water would be obtained from the North Weld Irrigation District.

Rockies Express would comply with the hydrostatic test requirements outlined in the FERC Procedures and those required by the state of Colorado. Once testing is completed, Rockies Express would discharge the water on-site in accordance with a hydrostatic test water discharge permit obtained from the CDPHE. Specifically, Rockies Express proposes to discharge the test water in the southern end of the Cheyenne Hub where the water can pool and absorb slowly or be carried offsite through existing conveyances. Rockies Express would control the discharge to ensure it does not negatively impact any downhill neighboring lands by using tanks to store the water to be discharged, discharging small amounts over time, and utilizing proper energy dissipating devices.

Impacts from the withdrawal and discharge of test water would be minimized by following the requirements specified in the state hydrostatic test water discharge permits. Impacts from the withdrawal and discharge of hydrostatic test water would be short-term and not significant.

3.3 Federal Emergency Management Agency Flood Zones

Pipeline Project

The Cheyenne Connector Pipeline would cross FEMA 100-year flood zones at mileposts 27.8 to 28.4 (South Platte River) and mileposts 33.5 to 33.8 (Lone Tree Creek) (FEMA, 2017).

Although the Cheyenne Connector Pipeline would cross two waterbodies within 100-year flood zones, no permanent aboveground facilities would be in those areas. No permanent impacts on the function of these 100-year flood zones are anticipated, as no modifications to the flood zone that could alter its use during a flood event would occur.

Enhancement Project

The Cheyenne Hub and associated expansion, the temporary Rockport Station Staging Yard, and the Niobrara Staging Yard would not cross or otherwise affect any mapped FEMA 100-year flood zones. The Project area is mapped by FEMA as “Zone D,” which indicates that no analysis of flood hazards has been conducted in this area (FEMA, 2017).

3.4 Wetlands

The USACE defines wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soil conditions." We define wetlands as any area that is not actively cultivated or rotated cropland and that satisfies the requirements of the current federal methodology for identifying and delineating wetlands.

Pipeline Project

Cheyenne Connector conducted wetland delineations from October 2017 to early February 2018, in accordance with the USACE 8 *Wetlands Delineation Manual* (USACE 1987) and 8 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (USACE, 2010). Cheyenne Connector also accessed the U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory to determine if wetlands were present within the Project sites.

The Pipeline Project would cross 46 wetlands; all are palustrine emergent (PEM) wetlands, which are characterized by herbaceous hydrophytic vegetation and typically occur along stream banks and in wet meadows. Of the wetlands crossed, 18 would be open-cut and temporarily disturbed by the pipeline right-of-way or ATWSs, while 28 would be crossed via HDD or boring methods. Appendix F provides a complete list of all wetlands that would be crossed by the Pipeline Project, including milepost, crossing length, anticipated crossing method, and acres of temporary disturbance.

Construction of the Pipeline Project would impact about 5.2 acres of PEM wetlands. In accordance with the Procedures, Cheyenne Connector would limit impacts within the open-cut PEM wetlands to a 75-foot-wide construction corridor, with exceptions noted in section B.3.5, table 6, below.

Wetland crossings completed using the HDD or bore method would generally avoid and minimize the potential for wetland impacts resulting from erosion, sedimentation, and/or excess turbidity by avoiding surface disturbance in and immediately adjacent to the wetlands. However, as described above, the potential for accidental releases of drilling mud exists. Impacts from an inadvertent release would be minimized by implementation of Cheyenne Connector's *HDD Inadvertent Return Contingency Plan*, which includes procedures for monitoring, detection, isolating, stopping, and clean-up of inadvertent releases, as well as making necessary agency notifications.

In wetlands that are crossed via HDD, vegetation would be cleared between the drill entry and exit points to allow a clean visual path for observation, access, and to lay the drilling guide line. The amount of vegetation cleared would be only that necessary to allow the work to progress.

Impacts on wetlands from installing the pipeline via open-cut would include potential alteration of wetland value from vegetation clearing. Open-cut construction could result in temporary impacts on wetlands from the loss of herbaceous vegetation, potentially altering wildlife habitat; soil disturbance from excavation, trenching, grading, and compaction; increased sedimentation and turbidity; and hydrologic profile changes. Construction activities could also impact water quality within the affected wetlands as a result of increased sedimentation or inadvertent spills of fuel or chemicals. The use of timber mats or other temporary surface material to provide a stable work area within wetlands could also result in the compaction of wetland soils.

Cheyenne Connector would install and maintain erosion control measures in accordance with the FERC Procedures to avoid or minimize impacts on wetlands. Cheyenne Connector would also minimize wetland impacts by implementing the construction and mitigation measures outlined in the FERC Procedures and adhering to applicable permit requirements. General construction and mitigation measures from our Procedures include:

- limiting construction right-of-way width in wetlands to 75 feet;
- limiting construction equipment in wetlands to that needed to clear the right-of-way, excavate the trench, fabricate the pipe, install the pipe, backfill the trench, and restore the right-of-way;
- minimizing the length of time that topsoil is segregated and the trench is open;
- installing trench breakers at the wetland boundaries and/or sealing the trench bottom as necessary to maintain the original wetland hydrology; and
- prohibiting the use of lime, fertilizer, or mulch during restoration of wetlands.

Cheyenne Connector's SPRP would provide for 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 requested by Cheyenne Connector and approved by the FERC. Based on these measures, we find the potential for a release of fuel or hazardous material into a wetland would be minimized to the extent practicable.

After construction, the wetlands would be restored and revegetated. In PEM wetlands, herbaceous vegetation generally regenerates quickly (typically within 1 to 3 years). There would be no permanent impact on emergent wetland vegetation in the maintained pipeline right-of-way because these areas naturally consist of, and would remain, as open and herbaceous communities.

Cheyenne Connector would conduct all crossing of wetlands in compliance with its USACE Nationwide Permit 12. Based on the above discussion, we conclude that impacts on wetlands resulting from construction and operation of the Pipeline Project would be short-term and not significant.

Enhancement Project

Rockies Express conducted wetland delineations on October 31, 2017 for the proposed expansion area to the west of the fence line of the Cheyenne Hub, the Rockport Station Staging Yard, and the Niobrara Staging Yard. No wetlands were identified during this survey. Because no wetlands exist at any of the Enhancement Project sites, no impacts on wetlands would result from construction and operation of the Enhancement Project.

3.5 Requested Modifications to the FERC Procedures

Cheyenne Connector has adopted the May 2013 version of the FERC Procedures for the Pipeline Project, with some requested modifications. The requested modifications relate to Cheyenne Connector's proposed waterbody and/or wetland setback distances at two locations for ATWS. At three other sites, Cheyenne Connector is requesting a construction right-of-way that is greater than 75 feet wide in wetlands. Table 6 summarizes the locations where Cheyenne Connector asserts that the requirements of the Procedures cannot be met due to site-specific conditions, and includes Cheyenne Connector's site-specific justifications. We have reviewed these modifications and find them acceptable.

Table 6
Deviations from FERC Procedures

Cheyenne Connector Pipeline Milepost	Feature	Activity Requiring Modification	Location in Procedures (Section)	Justification for Modification
13.7	WB007	ATWS-046 less than 3 feet from wetland	VI.B.1.a	Unable to set ATWS back for bore.
27.3	WB041 and WL027	construction right-of-way greater than 75 feet wide in wetlands	VI.A.3	Area needed for HDD pullback space and for the tie-in of induction bend. Wetland and waterbody to be bridged over.
		ATWS-117 and ATWS-122 within wetland WL027 and waterbody WB041	V.B.2a; VI.B.1.a	
14.9	WL011	construction right-of-way greater than 75 feet wide in wetland	VI.A.3	Area needed for HDD pullback space and for the tie-in of induction bends.
		ATWS-053A within wetland WL011	VI.B.1.a	
14.9	WL013	ATWS-053A within wetland WL013	VI.B.1.a	Area needed for HDD pullback space and for the tie-in of induction bends.
15.7	WL013R	construction right-of-way greater than 75 feet wide in wetlands	VI.A.3	Area needed for tie-in of induction bends and HDD pad. Entire area to be matted.
		ATWS-055R within wetland WL013R	VI.B.1.a	
24.8	WL023/WB024	ATWS-099 15 feet from wetland WL023 and waterbody WB024	V.B.2a; VI.B.1.a	Area needed for HDD pullback ATWS-099.
27.7	WL028	ATWS-122 within wetland WL028	VI.B.1.a	Area needed for ATWS-122. Wetlands to be bridged over.
27.8	WL029	ATWS-122 within wetland WL029	VI.B.1.a	Area needed for ATWS-122. Wetlands to be bridged over.

4. Vegetation and Wildlife

4.1 Vegetation

The Projects are in the following Level IV Ecoregions: Rolling Sand Plains, Moderate Relief Plains, and Flat to Rolling Plains. Vegetation community types affected by the Projects include shrublands, forest (upland and wetland), open land, and herbaceous (upland and wetland). A list of species representative of each of these communities is provided below.

- **Shrubland:** Sand sagebrush, leadplant, honey mesquite, sand cherry, skunkbush sumac, soapweed yucca, big bluestem, giant sandreed, little bluestem, sand dropseed, giant dropseed, and needle-and-thread grass.

- **Forest:** Green ash, gambel oak, Russian olive, eastern cottonwood, willow, saltcedar, peachleaf willow, narrowleaf willow.

- **Herbaceous:** Oats, brome, Mediterranean grass, saltlover, burningbush, Russian thistle, Canada thistle, spear thistle, knapweed, leafy spurge, woad, pepperweed, sweet clover, yellow sweet clover, scotch thistle, crested wheat grass, smooth brome, Lehmann lovegrass, fountaingrass, bulbous bluegrass, Kentucky bluegrass, intermediate wheatgrass, reed canarygrass, prairie cordgrass, common threesquare, showy milkweed, Emory's sedge, field horsetail, witchgrass, and spotted ladysthumb.

- **Western Great Plains Foothill and Piedmont Grassland:** Big bluestem, little bluestem, green needlegrass, western wheatgrass, sand dropseed, blue grama, needle-and-thread grass, and New Mexico feathergrass.

- **Western Great Plains Shortgrass Prairie:** Purple threeawn, sideoats grama, hairy grama, buffalo grass, threadleaf sedge, long-stolon sedge, needle-and-thread grass, New Mexico feathergrass, prairie junegrass, western wheatgrass, James' gelleta, alkali sacaton, sand dropseed, sand sagebrush, prairie sagewort, big sagebrush, fourwing saltbrush, James' buckwheat, broom snakeweed, pale desert-thron, and soapweed yucca.

The Pipeline Project would affect mostly herbaceous cover (573 acres). The Pipeline Project would also affect 0.4 acre of shrubland and 9.5 acres of isolated forested areas (upland and wetland). Only 2.9 acres of forest would be permanently maintained in an herbaceous state, with the other 6.6 acres reverting to pre-existing conditions, although this would be a long-term impact. Table 7 shows acreages of vegetation types affected by components of the Projects.

The Enhancement Project consists mainly of previously developed (existing facility) and herbaceous vegetation cover. The Enhancement Project would affect approximately 67.3 acres of herbaceous/disturbed herbaceous areas during construction, which includes 31.1 acres of permanent impact for its operation.

The primary direct impact on vegetation would be the temporary and permanent alteration of vegetation cover along the construction right-of-way and facility sites. Crews would clear the right-of-way where necessary to create a safe working surface for construction equipment. Temporary workspace and ATWS outside of the permanent right-of-way would revert to preconstruction vegetation communities. Although the operational corridor would be maintained during the life of the Cheyenne Connector Pipeline and the O'Connor Lateral, the corridor would be re-vegetated as shortgrass prairie or returned to its previous land use. Permanent disturbance at the M&R stations, PARs, pig receiver, and the three MLVs would result in the permanent loss of 8.4 acres of vegetated areas. As stated above, the Enhancement Project would result in about 9 acres of permanent disturbance of previously undisturbed herbaceous communities for the expansion of Rockies Express' existing aboveground facilities. A summary of the Projects' impacts on vegetation is provided in table 7 below.

Table 7
Vegetation Affected by the Projects (acres) a/

	Herbaceous		Shrubland		Forest		Total b/	
Facility	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**	**Const**	**Oper**
Pipeline Project								
Cheyenne Connector Pipeline and O'Connor Lateral	397.4	161.2	0.9	0.4	5.7	2.9	404	165
ATWS	40.9	0	0	0	1.8	0	42.7	0
Contractor Yards	78.8	0	0	0	0.5	0	79.3	0
Access Roads	45.3	0.8	0	0	1.1	0	46.4	0.8
Aboveground Facilities	7.2	2.6	0.2	0	0	0	7.4	2.6
Enhancement Project								
Existing Cheyenne Hub Facility	20.5	20.5	0	0	0	0	20.5	20.5
Cheyenne Hub Expansion Area	9	9	0	0	0	0	9	9
Staging Yards	35	1.6	0	0	0	0	35	1.6
Access Roads	2.8	0	0	0	0	0	2.8	0
Total b/	637	196	1.1	0.4	9.1	2.9	647	199

Const = construction impacts [includes all impacts from construction and operation (temporary and permanent)].
Oper = operation impacts (permanent impacts).
a/ Includes wetlands and uplands.
b/ Totals are rounded and may not reflect the exact sum.

Potential indirect impacts from the Projects' construction activities would include compaction of soils and alteration of topsoil layers during construction, which could affect revegetation of the areas after construction. The Applicants would return temporary work areas to pre-existing contours and conditions as best as possible and revegetate the areas in accordance with landowner requirements and/or NRCS-recommended seed mixes. The movement of construction equipment and clearing of vegetation could facilitate the spread of invasive or noxious weeds, which would also affect the revegetation success of native communities post-construction.

The Colorado Department of Agriculture manages the control and treatment of noxious weeds within the state of Colorado through the implementation of federal and state eradication and control programs. Noxious weeds in Colorado are administered under the Colorado Noxious Weed Act (Title 35, Article 5.5).

During field surveys for the Cheyenne Connector Project, surveyors recorded several weeds from Colorado Noxious Weed List B and List C (Colorado Weed Management Association, 2017). Species from List B recorded during the surveys include Canada thistle, Dalmatian toadflax, Hounds tongue, leafy spurge, perennial pepperweed, Russian knapweed, Russian olive, and Scotch thistle. List C species recorded during the surveys include common burdock, common mullein, downy brome, field bindweed, poison hemlock, puncture vine, and redstem filaree. List C contains species that are widespread and common throughout the state; however, Colorado has developed noxious weed management plans to stop the continued spread of the species on List B. Noxious weed species found at the Enhancement Project site include cheatgrass and field bindweed.

Cheyenne Connector states it has developed a *Noxious Weed Management Plan* in consultation with Weld County regarding the county's specific requirements for dealing with state-listed invasive species during pipeline construction and operation. Rockies Express would follow similar measures to avoid spread of noxious weeds during construction of the compressor station expansion.

To minimize impacts on vegetation as a result of the Projects, including noxious weed control, the following measures would be implemented by the Applicants:

- implementing the FERC's Plan and Procedures, with the exception of requested modifications to the Procedures discussed in section B.3.2;
- revegetating all disturbed areas as requested by landowners. Seed mix and seeding rates would be developed through consultation with the local NRCS office and landowners;
- using BMPs during all phases of construction to reduce impacts from sedimentation and erosion;
- cleaning all construction equipment before mobilization to the site to prevent the spread of noxious weeds;

- monitoring the non-cultivated portions of the right-of way for noxious weeds during restoration and post-construction monitoring; and
- controlling noxious weeds by spraying or hand removal, as appropriate and as allowed or directed by the landowner.

Overall, we conclude that due to the limited amount of permanent loss of vegetation communities and the Applicants' proposed restoration and revegetation procedures for construction areas and measures to avoid the spread of noxious weeds, the Projects would not have significant impacts on vegetation.

4.2 Wildlife

Some common wildlife species that inhabit the ecoregions of the Projects' area are the Western grebe, lark bunting, killdeer, white-tailed deer, coyote, prairie vole, red fox, raccoon, striped skunk, plains spadefoot, many-lined skink, and tiger salamander. The Projects would not cross any Colorado Parks and Wildlife (CPW) State Wildlife Areas.

The Projects would, however, cross CPW Hunting Units 87, 94, and 951. The CPW has mapped winter range habitats for mule deer, white-tailed deer, pronghorn, and wild turkey. The Projects' areas contain winter range and winter concentration areas for all of these species with the exception of wild turkey. The Pipeline Project would permanently affect less than 1 acre of winter range and winter concentration areas of mule deer, pronghorn, and white-tailed deer. The Enhancement Project would permanently affect 9 acres of mule deer and pronghorn winter range and winter concentration area. The Applicants plan to construct between April and October of 2019, which would avoid construction within winter concentration areas for big game species during most of the winter season (late October to late April). The Applicants have initiated consultation with the CPW regarding any special measures (in addition to the seasonal timing restriction) that should be taken when constructing in a winter concentration area and would follow any recommendations provided by the CPW, if necessary.

Impacts on wildlife would include temporary and permanent habitat loss, disturbance and displacement from noise and clearing activities, and mortality of smaller or less mobile species. During construction, the more mobile species would be temporarily displaced to similar habitats nearby. Some wildlife displaced during construction would return to the newly disturbed area and adjacent, undisturbed habitats soon after completion of construction. Less mobile species, such as small mammals, reptiles, and amphibians may be killed during construction activities. Clearing of vegetation would reduce nesting, cover, and foraging habitat for many species. Because most of the vegetation cover affected by the Projects is herbaceous or agricultural (over 95 percent), most habitat would be restored to near pre-existing condition a few years after construction.

Noise from construction, especially near HDD activities, could temporarily affect wildlife behavior, including foraging, mating, nesting, etc. Noise may also cause individuals to temporarily relocate from the area. Because construction noise would be short-term (typically, a matter of weeks) and generally diminishes in a relatively short distance from the source, wildlife would not experience significant effects due to noise disruption. Operational noise from the compressor station and aboveground facilities could cause a short-term response in behavior of wildlife in the area, but due to the existing industrial facilities in the area, wildlife are assumed to already be habituated to the noise from operating facilities. Wildlife in the area would become eventually become habituated to any increase in operational noise.

Routine maintenance activities on the permanent right-of-way would not significantly affect wildlife due to the minor extent of those activities. The impact of the proposed Projects on agricultural and herbaceous habitats and associated wildlife species would be minor and short term because these habitats would regenerate within 1-5 growing seasons after construction. Out of the total vegetation cover affected by the Projects, over 95 percent is herbaceous or agricultural (1,551 acres). Impacts on forested habitat would be longer term as these areas would require decades to regenerate, and some forested areas would be permanently converted to herbaceous communities for pipeline operations. Conversion of wildlife habitats to industrial use facilities (M&R stations, MLVs, and compressor station facilities) and PARs to support the operation of the Projects would be considered permanent habitat loss. The Projects combined would result in a total of about 17.4 acres of permanent habitat loss.

Overall, we conclude that due to the limited amount of permanent loss of vegetation communities and wildlife habitat and the Applicants' proposed restoration procedures and mitigation measures for vegetation (i.e., wildlife habitat), the Projects would not have significant impacts on wildlife.

4.3 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 protected under Section 7 of the ESA, species proposed or candidates for listing by the USFWS, and those species that are state-listed as threatened, endangered, or otherwise considered sensitive.

Section 7(a)(2) of the ESA requires the Commission to ensure that any action it authorizes, funds, or carries out would not jeopardize the continued existence of federally listed or proposed listed species, or result in the adverse modification or destruction of critical habitat for federally listed and proposed species. As the lead federal agency for the Projects, FERC is responsible for ESA consultation with the USFWS to determine whether any proposed or federally listed species, or critical or proposed critical habitat may occur in the Projects' areas, and to determine the proposed action's potential impacts on these species and critical habitat. Species protected under state statutes do not carry

regulatory protection under the ESA, but impacts are reviewed if the applicable agency indicates its potential presence in the Projects' areas during consultation.

We have determined that Cheyenne Connector's Pipeline Project *may affect, but would not likely adversely affect* several federally listed species, as discussed further below.[8] Therefore, informal consultation with the USFWS is necessary to satisfy FERC's requirements under Section 7 of the ESA. In order to initiate and complete Section 7 consultation, we are requesting that the USFWS consider this EA (along with any species survey reports the USFWS may have received directly from Cheyenne Connector) as our biological assessment for the Pipeline Project, and that the USFWS provide concurrence, as appropriate, with our effect determinations.

Federally Listed Species

The USFWS's Information for Planning and Conservation tool identified 10 species that are protected under the ESA in Weld County: the black-footed ferret (*Mustela nigripes*), Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Mexican spotted owl *(Strix occidentalis lucida*), whooping crane (*Grus americana*), least tern (*Sterna antillarum*), piping plover (*Charadrius melodus*), Colorado butterfly plant (*Gaura neomexicana* spp. *coloradensis*), Ute Ladies'-tresses (*Spiranthes diluvialis*), western prairie fringed orchid (*Platanthera praeclara*) and pallid sturgeon (*Scaphirhynchus albus)*. No USFWS-designated Critical Habitat is present in Weld County.

Several of these species (the interior population of the least tern, pallid sturgeon, piping plover, western prairie fringed orchid, and the whooping crane) have been grouped together by the USFWS because of their dependency on water availability in the South Platter River System, and are known as the "Platte River Species Group." These species traditionally receive "jeopardy" determinations during project reviews of South Platte River Basin projects that require water depletions. However, the proposed Projects would not result in water depletions from the South Platte River; thus, our assessment of the above species focuses only on potential impacts from facility construction and operation.

The whooping crane, least tern, and piping plover have the potential to occur in the Pipeline Project area during migration in wetland or riparian areas of waterbodies. However, these species are very rare visitors to Weld County and are unlikely to occur. Further, these species are highly mobile and do not use Weld County for nesting purposes. Thus, any individuals present during construction could easily avoid activity areas. Based on guidance from the USFWS, because there is a chance these species could be encountered in wetland/riparian habitat or stream banks during construction of the Pipeline Project, the appropriate effects determination is *may affect, but not likely to*

[8] We have determined that Rockies Express' Enhancement Project would *not affect* any federally listed species; thus, Section 7 consultation for this proposed action is completed.

adversely affect. Because these species are rare mobile visitors to the area and they would most likely avoid active areas of construction, we conclude there is a very low chance that the Pipeline Project would impact these species. Due to lack of suitable habitat, the Enhancement Project would not affect these species at all.

We have also determined that the Projects would have *no effect* on black-footed ferret, Preble's meadow jumping mouse, or Mexican spotted owl, since these species are not expected to occur in the area of the Projects because of lack of suitable habitat. As indicated above, the Projects would also have *no effect* on the western prairie fringed orchid and pallid sturgeon since the Projects do not involve any water depletions from the South Platte River.

Based on Cheyenne Connector's field surveys, the remaining two species (Colorado butterfly plant and Ute Ladies'-tresses) could be present in certain areas crossed by the Pipeline Project. The Enhancement Project does not contain suitable habitat for these two plant species. A more detailed description of these two species, along with our effects determinations, are provided below.

Colorado butterfly plant

Colorado butterfly plant is an early successional, short-lived perennial herb typically found on stream channels that are periodically disturbed. It is listed as threatened under the ESA. Naturally occurring populations of Colorado butterfly plant occur in northern Weld and Larimer Counties, Colorado. The documented population in Weld County occurs along a 0.5-mile section of a wet meadow along Spring Creek at the Meadow Springs Ranch, an area that has historically been managed for livestock grazing and municipal sewage treatment.

Cheyenne Connector's field surveys indicated that wetlands WL057, WL058, and WL059 provide suitable habitat for the Colorado butterfly plant. Wetland WL059 would be temporarily disturbed and trenched by Cheyenne Connector for the Pipeline Project. The HDD of the South Platte River would avoid a large portion of suitable habitat along the right-of-way.

Cheyenne Connector conducted surveys for the presence of Colorado butterfly plant in July and August of 2018 (during the peak flowing period) in accordance with survey protocols established by the USFWS. No individuals were found during surveys, but the seed bank in the suitable habitat could still contain these species. If any individuals or populations are observed during construction, Cheyenne Connector stated it would work with the USFWS and CPW to determine the appropriate mitigation measures or seek to avoid populations through HDD, minor adjustments in the pipeline alignment, or by reducing the right-of-way width in those areas, where possible. In addition, disturbance and restoration of the sites would lead to growth of a successional vegetation community, which could also benefit the Colorado butterfly plant.

Ute ladies'- tresses

Ute ladies'-tresses is a perennial terrestrial orchid and is listed as threatened under the ESA. Suitable habitat for this species includes riparian edges, gravel bars, old oxbows, high flow channels, and moist and wet meadows along perennial streams. These orchids are found in the upper Colorado River Basin and along the northern Front Range. The only documented occurrence in Weld County occurred in 1856 along Crow Creek, but this population is considered extirpated.

Wetlands WL011 and WL013, which would be trenched for the pipeline, contain potential suitable habitat for the Ute ladies'-tresses. Wetlands WL010 and WL032 in the proposed bore workspace also contain suitable habitat. The HDD of the South Platte River would avoid a large portion of suitable habitat along the right-of-way.

Cheyenne Connector conducted presence/absence surveys for the Ute ladies'-tresses during the flowing period in July and August 2018 in the suitable locations described above, in accordance with survey protocols established by the USFWS. No individuals or populations were found. If Ute ladies'-tresses are observed during construction, Cheyenne Connector stated it would work with the USFWS and CPW to determine the appropriate mitigation measures or seek to avoid populations through HDD, minor adjustments in the pipeline alignment, or by reducing the right-of-way width in those areas, where possible.

We have reviewed Cheyenne Connector's commitments and proposed mitigation measures regarding the Colorado butterfly plant and Ute ladies'-tresses, and believe they provide appropriate protections so that the Pipeline Project *would not likely adversely affect* individuals or populations of these plants. However, because we have not completed Section 7 ESA consultation with the USFWS, **we recommend that:**

- **Cheyenne Connector <u>should not begin construction activities until</u>:**

  a. any outstanding or additionally required biological surveys for the Colorado butterfly plant and/or the Ute ladies'-tresses are completed and the results filed with the Secretary;

  b. the FERC staff completes any necessary ESA section 7 consultation with the USFWS; and

  c. Cheyenne Connector has received written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.

<u>State-Protected Species</u>

Nine plant and animal species that are listed as either threatened or a Species of Concern by CPW have the potential to occur near the Projects. These species include the bald eagle, black tailed prairie dog, river otter, swift fox, burrowing owl, ferruginous

hawk, mountain plover, plains sharp-tailed grouse, and the brassy minnow. We determined that the Projects would not affect the river otter or plains sharp-tailed grouse due to lack of suitable habitat in the Projects' areas; therefore, these species are not discussed further. The bald eagle is discussed in section B.5.4, below.

Black tailed prairie dog

In Colorado, black-tailed prairie dogs (*Cynomys ludovicianus*) are designated as a Species of Concern. They typically occur east of the foothills in shortgrass or mixed-grass prairie. Prairie dogs construct burrowing colonies made up of territorial family groups. Black-tailed prairie dog colonies can provide habitat for other sensitive species, including mountain plover and burrowing owl. Agriculture and urban development have fragmented their habitat, which has contributed to their decline.

Cheyenne Connector's field surveys identified eight prairie dog colonies that would be crossed or otherwise impacted by the Pipeline Project. (The Enhancement Project would not impact any prairie dog colonies). Due to the large size and number of colonies in the Pipeline Project area, there is no practical way for Cheyenne Connector to route the pipeline to result in complete avoidance of the colonies. Thus, to minimize impacts, Cheyenne Connector has agreed to not construct during the prairie dog breeding season. However, impacts on prairie dogs, including direct and indirect impacts on individuals and destruction of habitat, would result as a result pipeline construction. Cheyenne Connector stated it would consult with the CPW regarding recommendations to minimize impacts on state species of concern, including the black-tailed prairie dog.

Swift Fox

The swift fox (*Vulpes velox*) has been designated a Species of Concern in Colorado. It inhabits shortgrass and midgrass prairie ecosystems of the Great Plains. Habitat reduction, predator control campaigns, and unregulated trapping in the early 1800s to the mid-1900s reduced the range of this species. Swift foxes are associated with prairie dog colonies and are known to occur within grassland habitat in northern and eastern Weld County.

No fox dens were observed within the Projects' survey areas, but suitable habitat is present. The Applicants would avoid dens if detected during construction. Because foxes are mobile and would most likely avoid the construction work area, we do not anticipate direct impacts on foxes, although any undetected dens could be destroyed. Construction activities would be short-term in any one area, and overall impacts of the Projects on suitable habitat would be temporary. We conclude that the Projects would not have a significant impact on swift foxes.

Burrowing Owl

Burrowing owl (*Athene cunicularia*) is listed as threatened by the state of Colorado. It is small owl that typically uses abandoned prairie dog burrows for nesting and roosting. These owls are a migratory species and only occur in the Projects' areas from late March through October. Loss of burrows and loss of foraging habitat are the main threats to the species. Burrowing owls are known to breed in Weld County and may use agricultural fields in the Projects' areas for foraging or during migration.

The eight prairie dog colonies within the Pipeline Project survey area (discussed above) provide suitable nesting habitat for the burrowing owl. As construction is anticipated to take place within prairie dog colonies between March 15 and November 1, Cheyenne Connector would conduct preconstruction burrowing owl surveys using the CPW's *Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls*. Because Cheyenne Connector would survey for burrowing owl presence and avoid any active nests, we conclude that the Pipeline Project impacts on the burrowing owl would be minimal.

Ferruginous hawk

Ferruginous hawks (*Buteo regalis*) have been state-designated as a Species of Concern in Colorado. They inhabit open grasslands and shrub steppe communities. Black-tailed prairie dog is an important prey species for the hawk in Colorado, and they are typically found where prairie dogs are abundant. Cheyenne Connector would conduct pre-construction surveys for ferruginous hawk nests near the construction work area where prairie dog colonies are present and if a nest is discovered, Cheyenne Connector would coordinate with the CPW to minimize impacts (see also our discussion on migratory birds and raptors in section B.4.4, below). Accordingly, we conclude that impacts on the ferruginous hawk would be minimal.

Mountain Plover

The mountain plover (*Charadrius montanus*) has been state-designated as a Species of Concern in Colorado. Plovers nest in shortgrass prairies and agricultural fields and sometimes use prairie dog colonies. Because of the presence of prairie dog colonies, bare ground, and suitable grazed pasturelands in the survey area of the Pipeline Project, mountain plovers may be affected by construction of the pipeline. Similar to the ferruginous hawk, Cheyenne Connector would consult with the CPW and conduct pre-construction surveys for nests to minimize impacts on mountain plovers. We conclude that impacts on the mountain plover would be minimized.

Brassy Minnow

Brassy Minnow (*Hybognathus hankinsoni*) habitat consists of low-gradient, weedy creeks or small rivers with sand, gravel, or mud bottoms. The brassy minnow could be

present in the South Platte River; however, it is more likely to be found in tributaries, with the South Platte River acting as a conduit to connect separate tributary populations. The Pipeline Project would cross the South Platte River and other perennial tributaries using HDD and bore techniques, which would avoid any direct in-water impacts. However, an inadvertent release of drilling fluids during the HDD process could result in turbidity and excess bentonite in the South Platte River, potentially causing direct impacts on brassy minnows. Because Cheyenne Connector has developed an HDD Contingency Plan to contain and respond to an inadvertent release, any impacts on the brassy minnow from a potential spill of drilling fluids into the river would be minimized.

The Applicants are continuing to consult with the CPW regarding sensitive species protection. All personnel for both Projects will be required to attend environmental orientation prior to beginning work. The environmental orientation will include training related to identification, avoidance measures and reporting required if any black-tailed prairie dog, swift fox, ferruginous hawk, or mountain plover are present in the work area. Due to the Applicants' agreement to implement the FERC Plan and Procedures, commitment to restore pre-construction contours, and increase the potential for successful revegetation of habitats, as well as the surveys and other species-specific measures discussed above, we determined that impacts on state-sensitive species would be avoided or appropriately minimized.

4.4 Migratory Birds, Bald Eagles, and Colorado Raptors

Migratory bird species nest in the United States and Canada during the summer months and then migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the nonbreeding season. Some species migrate from breeding areas in the north to the Gulf Coast for the nonbreeding season. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA), which prohibits the intentional take or killing of individual migratory birds, their eggs and chicks, and active nests. The MBTA provides that it is unlawful to pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird. Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds, issued January 10, 2001) directs federal agencies to consider the effects of agency actions on migratory birds and determine where unintentional take is likely to have a measurable negative effect on migratory bird populations, and to avoid or minimize adverse impacts on migratory birds through enhanced collaboration with the USFWS. The executive order 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 USFWS and the Commission entered into a Memorandum of Understanding that focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This voluntary Memorandum of Understanding does not waive legal requirements under the MBTA,

Bald and Golden Eagle Protection Act (BGEPA), ESA, Federal Power Act, NGA, or any other statute and does not authorize the take of migratory birds.

In order to accurately identify bird species with the greatest conservation priority and stimulate action by federal/state agencies and private parties, the USFWS Migratory Bird Office issued a report describing "Birds of Conservation Concern" (USFWS, 2008a). The report identifies priority bird species at the national, regional, and Bird Conservation Region levels. There are 17 USFWS-designated Birds of Conservation Concern species known to occur in Weld County (table 8).

Table 8
USFWS Birds of Conservation Concern Known to Occur in Weld County

Common Name	Scientific Name	Season	Nest Substrate		
			Ground/ Herbaceous	Shrub	Tree/Cliff
Buff-breasted Sandpiper	*Tryngites subruficollis*	Migration	*	*	*
Burrowing owl	*Athene cunicularia*	Breeding	Yes	No	No
Cassin's sparrow	*Aimophila cassinii*	Breeding	Yes	No	No
Chestnut-collared Longspur	*Calcarius ornatus*	Breeding	Yes	No	No
Golden eagle	*Aquila chrysaetos*	Breeding	No	No	Yes
Hudsonian godwit	*Limosa haemastica*	Migration	*	*	*
Lark bunting	*Calamospiza melanocorys*	Breeding	Yes	Yes	No
Lesser yellowlegs	*Tringa flavipes*	Migration	*	*	*
Lewis's woodpecker	*Melanerpes lewis*	Breeding	No	No	Yes
Long-billed Curlew	*Numenius americanus*	Breeding	Yes	No	No
Mccown's Longspur	*Calcarius mccownii*	Breeding	Yes	No	No
Mountain plover	*Charadrius montanus*	Breeding	Yes	No	No
Semipalmated sandpiper	*Calidris pusilla*	Migration	*	*	*
Sprague's pipit	*Anthus spragueii*	Migration	*	*	*
Whimbrel	*Numenius phaeopus*	Migration	*	*	*
Willet	*Tringa semipalmata*	Breeding	Yes	No	No
Willow flycatcher	*Empidonax traillii*	Breeding	No	Yes	Yes

* Species is not known to nest in Weld County.

Beyond the MBTA, the BGEPA provides additional protection to bald and golden eagles. The BGEPA prohibits the take, possession, sale, offer to sell, purchase, barter, transport, export or import, of any bald or golden eagle, alive or dead, including any part,

nest, or egg, unless allowed by permit. "Take" under this act is defined as "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb." Disturb is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." If a proposed project or action occurs in an area where nesting, feeding, or roosting eagles occur, the proponent often needs to implement special conservation measures to comply with the BGEPA.

Several bald eagle habitats have been mapped by the CPW near the Pipeline Project area. Specifically, the Pipeline Project would cross within 0.5 mile of four active or recently active bald eagle nests (table 9). Additionally, 140 acres of the Pipeline Project's contractor yards would be within bald eagle winter range.

Table 9
Bald Eagle Habitat, and CPW Nest Buffers Crossed by the Pipeline Project

Bald Eagle Area	Mile-post Entry	Mile-post Exit	Temporary Disturbance (acres)			Permanent Disturbance (acres)	
			ATWS	Temporary right-of-way	Temporary Access Roads	Facilities	Perm. Access Roads
Bald Eagle Winter Habitat	25.9	64.5	143.5	315.51	50.61	0.16	0.13
Bald Eagle Winter Concentration Area	26.8	28.3	12.61	10.40	8.86	0.00	0.00
Bald Eagle 0.5-mile CPW Nest Buffer 1 (BAEA01)	23.9	24.9	3.64	8.34	5.51	0.00	0.00
Bald Eagle 0.5-mile CPW Nest Buffer 2 (BAEA02)	27.4	28.5	10.51	3.31	7.87	0.00	0.00
Bald Eagle 0.5-mile CPW Nest Buffer 3 (BAEA03)	39.9	40.9	4.40	8.56	0.00	0.00	0.00
Bald Eagle 0.5-mile CPW Nest Buffer 4 (BAEA04)	57.1	58.1	1.72	8.72	0.00	0.00	0.00

In Weld County, the general raptor nesting season is February 1 to July 31. Raptor nesting habitat within 0.5 mile of the Projects was surveyed by the Applicants in October and November of 2017 (ground and pedestrian survey) and again in Spring 2018

(aerial survey). An aerial nest survey during the active nesting season was conducted to determine nest type and status (active vs. inactive) as well as behavior or nest status observations (number of adult birds, number of eggs or young, incubating, etc.) of each known or previously recorded raptor or eagle nest. A total of 43 raptor nests were discovered during aerial surveys in the vicinity of the Pipeline Project. A total of three bald eagle nests, fourteen red-tailed hawk nests, and four great-horned owl nests were documented as active. Bald eagles are known to return to the same nests or area year-to-year. Because other species are not as predictable and new nests may be constructed each nesting season, the Applicants would re-survey for nests in Spring 2019 prior to construction. No nests were discovered in the vicinity of the Enhancement Project during the 2017 and 2018 surveys.

Cheyenne Connector proposes to begin construction in April 2019 and continue through October 2019. As construction would take place during nesting seasons for raptors and other migratory birds, direct and indirect impacts could occur on nesting birds, eggs, and young. Direct and indirect impacts on nesting birds could result in abandonment of a nest and death of eggs or young. Increased noise levels and human presence from construction near nesting habitats would disturb nesting species and potentially result in increased stress and decreased ability to successfully rear their young. Active nests within 0.5 mile of the construction work area would be the most vulnerable to indirect impacts from construction.

The Projects would permanently convert approximately 11.7 acres of nesting habitat for birds that nest or forage in native herbaceous/grassland habitat. The Applicants would restore any nesting or foraging habitats in the temporary construction right-of-way.[9] Cheyenne Connecter has developed a draft *Migratory Bird Treaty Act Conservation Plan*, which includes measures to avoid, minimize, and/or mitigate impacts on migratory birds and bald eagles. Cheyenne Connector states that this plan was reviewed by the USFWS; however, Cheyenne Connector has not filed the final plan with FERC or indicated how it has addressed any remaining concerns of the USFWS. Therefore, **we recommend that**:

- **<u>Prior to construction</u>, Cheyenne Connector should file with the Secretary the final Migratory Bird Conservation Plan developed in consultation with the USFWS, along with any comments on the plan provided by the USFWS.**

The Applicants state that they will conduct additional surveys to document nest status in the spring of 2019, in consultation with the USFWS. If Project activity would take place within the designated buffer zones of any active migratory bird nests, the Applicants would consult with the USFWS on any necessary BMPs, avoidance protocols,

[9] Although no active nests were found in the area of the Enhancement Project, it is possible that migratory birds could be found in the area of the compressor station expansion at the time of construction. Rockies Express has agreed to apply appropriate avoidance or minimization measures if active nests are discovered during construction.

or fencing. The Applicants are continuing to consult with the CPW and USFWS on final guidance for seasonal timing limitations and recommended spatial buffers.

For active nests near the construction work area, the Applicants stated that they would adhere to CPW-recommended spatial buffers, which are more stringent than the USFWS' National Bald Eagle Management Guidelines. There may be specific cases where topography or type of vegetation separating the construction work from the nest may allow a different spatial buffer. The Applicants would discuss those cases on a site-specific basis with the USFWS and CPW. If construction is scheduled to occur within the buffer, the USFWS requires that the nest be monitored by a qualified biologist for signs of disturbance (e.g., calling, agitation, frequent movement on and off nest). If disturbance is observed, the USFWS states that work near the nest should stop and the Applicants should contact the appropriate USFWS and CPW offices for further guidance. If the Applicants cannot adhere to the spatial buffers or required monitoring by a qualified biologist, the USFWS would require them to seek take permits for bald eagles under the BGEPA.

If active nests are found before construction, the Applicants would attempt to adhere to the following nest buffer zones and seasonal restrictions recommended by the CPW:

- Bald eagle: 0.50-mile buffer from November 15 through July 31;
- Ferruginous hawk: 0.50-mile buffer from February 1 through July 15;
- Red-tailed hawk: 0.33-mile buffer from February 15 through July 15;
- Swainson's hawk: 0.25-mile buffer from April 1 through July 15; and
- Burrowing owl: 150-foot buffer from March 15 through October 31.

The CPW does not include a recommendation for great-horned owl; however, the USFWS recommends a 200-meter (0.125-mile) buffer.

If a previously unidentified nest is discovered in or directly adjacent to the right-of-way during construction, the Applicants would halt construction until a biological monitor clears the nest and all USFWS-approved BMPs and exclusionary devices are in place.

Based on the implementation of the Applicants' proposed minimization and mitigation measures to avoid or reduce impacts during the nesting season, we conclude that the Projects would not have significant impacts on migratory birds, including bald eagles and other raptors of concern. As stated previously, if the Applicants cannot implement USFWS requirements to avoid take of bald eagles, they would need to obtain take permits under the BGEPA in consultation with the USFWS.

4.5 Fisheries

No streams would be crossed or otherwise affected by the Enhancement Project. Most streams crossed by the Pipeline Project are intermittent or ephemeral and do not support a diversity of fish species and do not have a designated fishery classification. The Pipeline Project would cross one perennial stream - the South Platte River - which is designated by the CDPHE as a Class 2 Warm Water Fishery in this reach. The CDPHE's Aquatic Life Use Attainment Methodology to Determine Use Attainment for Rivers and Streams defines Class 2 streams as: "waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species." Owl Creek (an intermittent tributary crossed by the Project) is also designated as a Class 2 Warm Water Fishery. No construction is anticipated to take place within designated coldwater fisheries.

Several ponds and lakes near the Projects are stocked with fish; however, the nearest location upstream from the Projects that is stocked is the South Platte River at South Platte Park in Arapahoe County, Colorado. Some common fish species in the South Platte River watershed include: wiper (hybrid striped bass), white bass, walleye, saugeye, green sunfish, rainbow trout, largemouth bass, and smallmouth bass. There is no federally listed Essential Fish Habitat within or downstream of the Projects. None of the watersheds crossed by the Projects are designated by the CDPHE as Outstanding Waters or by the CPW as Gold Medal Waters.

Cheyenne Connector would use HDD or bore techniques to cross perennial or flowing waterbodies. Cheyenne Connector would open cut intermittent and ephemeral waterbodies that are not flowing at the time of construction. Potential impacts of construction include temporary fragmentation of stream habitat and clearing of riparian vegetation that could affect stream dynamics and habitat for fish and aquatic life within the streams. Other impacts from construction include increased sedimentation from upland areas within flowing streams and temporary increases in turbidity caused by runoff during storm events. Sedimentation and turbidity would directly affect habitat quality for aquatic life. However, these impacts would be short term during construction of the Pipeline Project. Cheyenne Connector would implement the FERC Procedures to reduce potential impacts from erosion and sedimentation.

Using HDD and bore techniques could result in an inadvertent release of drilling fluids, which would cause an increase in turbidity and excess non-toxic bentonite in the waterbody. A release of drilling fluids into the waterbody could cause direct impacts on fish and aquatic life, potentially resulting in mortality depending on the magnitude and severity of the spill. Because Cheyenne Connector has developed an *HDD Contingency Plan* to contain and respond to an inadvertent release, any impacts on aquatic species from a potential spill of drilling fluids would be minimized.

Cheyenne Connector indicates that in addition to water and bentonite clay, it may use polymers or other materials in its drilling fluids depending on the subsurface conditions encountered. To ensure that any additives Cheyenne Connector uses in its drilling fluids would not be toxic to fish or other aquatic species, **we recommend that**:

- **Prior to commencing HDD construction, Cheyenne Connector should file with the Secretary, for review and written approval by the Director of OEP, a list of any additional drilling fluid additives that could be used, as well as the Safety Data Sheets for each additive, and an affirmative statement that Cheyenne Connector would utilize only pre-approved, non-petrochemical-based, non-hazardous additives that comply with permit requirements and environmental regulations.**

We conclude that the Pipeline Project could result in temporary impacts on fish and aquatic species, but any impacts are not anticipated to affect the long-term health of these species.

5. Land Use, Recreation, and Visual Resources

Project construction would impact land use along the Pipeline Project including the Cheyenne Connector pipeline and each of the Lancaster, Latham, Mewbourn, O'Connor, and Connector M&R Stations; and at the Enhancement Project sites as described below. Land use descriptions are based on land cover types derived from the National Land Cover Dataset, observations made from aerial imagery, geographic information system technology, and ground-truthing during biological and cultural resource surveys.

No designated Coastal Zone Management Areas, registered national natural landmarks (National Park Service, 2017a), designated Wilderness Areas (Colorado Wilderness Areas, 2017), Wild and Scenic Rivers (National Wild and Scenic Rivers System, 2018), or designated National Trails (National Recreation Trails, 2017) are within 0.25 mile of any of the proposed Projects' activities. A review of the U.S. Department of Agriculture (2018) Agricultural Conservation Easement Program database indicated that there are no Program easements or other Agricultural Land Easements along the Pipeline Project.

Table 10 identifies the cover types affected by the Projects.

Table 10 Land Use Class Descriptions	
Category	**Description**
Water	**Open Water** - areas of open water, generally with less than 25% cover of vegetation or soil.
Developed	**Developed, Open Space** - areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
	Developed, Low Intensity - areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20 to 49% of total cover. These areas most commonly include single-family housing units.
	Developed, Medium Intensity - areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50 to 79% of the total cover. These areas most commonly include single-family housing units.
	Developed High Intensity - highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses, and commercial/industrial. Impervious surfaces account for 80 to 100% of the total cover.
Barren	**Barren Land (Rock/Sand/Clay)** - areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits, and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.
Forest	**Deciduous Forest** - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
	Evergreen Forest - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
	Mixed Forest - areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
Shrub	**Shrub/Scrub** - areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20% of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.
Herbaceous	**Grassland/Herbaceous** - areas dominated by gramanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be used for grazing.
Planted/Cultivated	**Pasture/Hay** - areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
	Cultivated Crops - areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20% of total vegetation. This class also includes all land being actively tilled.
Wetlands	**Woody Wetlands** - areas where forest or shrubland vegetation accounts for greater than 20% of vegetation cover, and the soil or substrate is periodically saturated with or covered with water.
	Emergent Herbaceous Wetlands - Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetation cover, and the soil or substrate is periodically saturated with or covered with water.

Temporary and permanent land use impacts are summarized in table 11. The acreage shown for construction impacts include all areas that would be disturbed, including both temporary and permanent (operational) impacts. In accordance with the FERC Plan, lands disturbed by the Projects' construction would be returned to their previous land use, except where there are permanent aboveground facilities, or where safety mandates a change in land use.

Table 11: Land Use Affected by Construction and Operation of the Projects

Facility	Planted/Cultivated		Herbaceous		Shrubland		Forest / Woodland		Wetlands a/		Open Water		Developed and Urban Land		Barren		Totals	
	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)	Const (Temp) b/	Oper (Perm)
Pipeline and Pipeline Construction																		
Cheyenne Connector Pipeline right-of-way	597.3	245.3	396.9	161.0	0.9	0.4	2.4	1.1	3.7	2.0	2.5	1.4	34.0	16.4	5.3	2.1	**1042.1**	**429.3**
O'Connor Lateral right-of-way	2.3	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	**2.4**	**1.6**
ATWSs	160.5	0.0	44.6	0.0	0.0	0.0	0.5	0.0	1.6	0.0	0.3	0.0	10.2	0.0	0.5	0.0	**218.2**	**0.0**
Contractor Yards	135.8	0.0	78.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.3	0.0	4.7	0.0	**228.2**	**0.0**
Access Roads	83.1	1.8	44.7	0.8	0.2	0.0	0.5	0.0	2.7	0.0	0.8	0.0	14.0	0.1	0.0	0.0	**146.0**	**2.7**
Pipeline Subtotal	**979.0**	**248.7**	**564.6**	**161.8**	**1.1**	**0.4**	**3.4**	**1.1**	**8.0**	**2.0**	**3.6**	**1.4**	**67.6**	**16.5**	**10.5**	**2.1**	**1636.9**	**433.6**
Aboveground Facilities																		
Lancaster M&R Station	1.6	0.5	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.5**	**0.6**
Mewbourn M&R Station	1.6	0.3	1.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	**3.5**	**1.0**
Latham M&R Station	1.6	0.3	1.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	**3.5**	**1.0**
MLV #1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**	**0.1**
O'Connor M&R Station	2.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.7**	**0.7**
O'Connor Pig Receiver	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.2**	**0.2**
MLV #2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**	**0.1**
MLV #3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.1**	**0.1**
Connector M&R Station	0.0	0.0	2.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**2.9**	**1.0**
Aboveground Facilities Subtotal	**7.8**	**2.1**	**7.3**	**2.6**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.5**	**0.0**	**0.0**	**0.0**	**15.6**	**4.8**
Cheyenne Connector Pipeline Project Totals c/	**986.8**	**250.8**	**571.9**	**164.4**	**1.1**	**0.4**	**3.4**	**1.1**	**8.0**	**2.0**	**3.6**	**1.4**	**68.1**	**16.5**	**10.5**	**2.1**	**1652.5**	**438.4**
Cheyenne Hub Enhancement Project Totals	**0.0**	**0.0**	**67.3**	**31.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**3.2**	**0.0**	**0.0**	**0.0**	**70.5**	**31.1**

a/ Impacts acreages represented for wetlands and open water, streams, and canals reflect information from the National Land Cover Dataset (NLCD) and do not reflect the actual delineated wetland and water features surveyed for these Projects. Field verified impact acreages for wetlands and open water, streams, and canals are included in detail in Resource Report 2, which can be viewed at FERC Accession No. 20180802-5006.

b/ The acreage affected by construction includes all areas that will be disturbed, including both temporary and permanent (operational) impacts.

c/ The numbers presented in this table have been calculated using raw data from GIS applications; there may be some apparent discrepancies between the sum of the individual feature cells, the subtotals, and the Project totals.

The Pipeline Project's construction right-of-way would generally be 125 feet wide (50-foot-wide permanent right-of-way plus a 75-foot-wide temporary construction right-of-way, with 15 feet on the spoils side and 60 feet on the working side) and 100 feet wide for the 0.25-mile-long lateral associated with the O'Connor M&R Station (50-foot-wide permanent right-of-way plus a 50-foot-wide temporary construction right-of-way). There are numerous areas along the alignment with a smaller temporary right-of-way due to landowner constraints and wetland impact avoidance. These areas would have a 50-foot-wide permanent right-of-way with additional 25-foot-wide temporary right-of-way. Typical construction right-of-way cross-section diagrams are provided in appendix B.

The Pipeline Project would affect approximately 1,652.5 acres during construction and 438.4 acres for operation and maintenance of the pipelines and aboveground facilities. Of the 70.6 miles of proposed new Cheyenne Connector Pipeline, 46 percent (33 miles) would be co-located with other existing pipeline rights-of-way. Following construction and installation, the right-of-way would be restored to support its original use.

Three MLV locations are proposed along the pipeline route. These locations would provide aboveground access to the pipeline and be contained within the permanent right-of-way of the pipeline. The temporary disturbance used during construction would be re-contoured and re-seeded per the FERC Plan and landowner agreements.

The Enhancement Project activities would affect approximately 70.5 total acres during construction, which includes 31.1 acres of permanent impact for the Enhancement Project's operation. A total of 9.0 acres of land use change would occur at the Cheyenne Hub expansion area which would be converted from Herbaceous to Developed use after construction. The remaining 22.1 acres of permanent impact represents the existing Cheyenne Hub and the Rockport Station Staging Yard which would remain as Disturbed, Medium Intensity land use classification after construction of the Enhancement Project.

Various ATWSs and staging areas, as indicated on the Pipeline Project alignment sheets,[10] would be required for construction work space at road crossings, railroad crossings, and waterbody crossings. The temporary disturbance used during construction would be re-contoured and re-seeded per the FERC Plan and landowner agreements.

During construction of the Pipeline Project, existing public and private roads would be used where available and practicable. For Pipeline Project construction, 91 existing two-track, gravel lane, and dirt lane roads would be used to access the pipeline right-of-way and construction area, summarized in appendix G. The majority of these TARs are existing gravel surface or dirt roads. Existing dirt roads could be improved (blading and/or gravel added) during construction as needed. Improvement work on existing roads would generally remain within pre-existing road widths. However, there

[10] Detailed alignment sheets for the Pipeline Project are filed in Docket Nos. CP18-102-000 and CP18-103-000 under Accession No. 20180802-5073.

would be some areas that widening of existing road widths would be required to facilitate safe bidirectional travel. In this situation, widening of the road surface should be limited to 30 feet, with overall temporary impacts up to 50 feet being needed during construction.

Any widening of existing roads would be performed in upland areas and would avoid impacts on existing wetlands or waterbodies intersecting or adjacent to these roads. For the limited number of unimproved or new roads (two-tracks or obtaining new right-of-way access through agricultural/pasture fields), improvements (blading, grading, adding gravel or travel surface widening) in widths up to 30 feet with overall temporary impacts up to 50 feet would be needed during construction. For the few areas where identified waterbody or wetland features are adjacent to these upgraded or new TARs, widening and improvements would be limited to avoid impacts on these features. Dependent on landowner stipulations, TARs that are improved or newly constructed will be restored to pre-construction conditions or left in the improved condition. Nine PARs would be constructed for access to the proposed aboveground facilities and MLVs.

During construction of the Enhancement Project, one TAR would be constructed to the east and north of the existing Cheyenne Hub site in order to access the expansion area on the west side of the Hub. Additionally, the existing PAR off Colorado State Highway (CSH) 85 at the southeast corner of the existing Cheyenne Hub site would be utilized during construction and operation of the new and modified Cheyenne Hub facilities. The TAR providing access to the expansion area west of the Hub would be returned to its previous land use after construction.

Contractor yards would be used for staging, storage, and contractor operations and would not always be directly adjacent to the Cheyenne Connector pipeline right-of-way. Of the nine contractor yards proposed for use during construction of the Pipeline Project, four would use existing, disturbed areas and five yards would require new disturbance. Rockies Express proposes to use two staging yards for temporary material and equipment storage areas for the Enhancement Project. All contractor yards for the proposed Projects are listed in table 12. The proposed contractor yards not previously disturbed have been surveyed for the presence of threatened and endangered species or their habitat and for cultural resources. The Applicants would complete some minor grading of these lots to bring them to level and make them suitable for storing pipe and for staging construction.

Table 12 Contractor Yards Required for the Projects a/		
Yard Name	**Land Cover (acres impacted)**	**Total Temporary Impact (acres)**
South Spread Staging Yard	Grassland/Herbaceous (0.71 acre) Cultivated Crops (2.79 acres)	3.50
Anadarko Staging Yard	Cultivated Crops (7.37 acres) Grassland/Herbaceous (7.73 acres)	15.10
Eaton Jomax Yard	Developed, Low Intensity (0.21 acre) Developed, Medium Intensity (0.11 acre) Developed, Open Space (0.22 acre) Cultivated Crops (11.18 acres)	11.72
Eaton Rail/Storage Yard	Pasture/Hay (0.15 acre) Grassland/Herbaceous (0.52 acre) Developed, Open Space (0.05 acre) Developed, Low Intensity (0.20 acre) Cultivated Crops (80.07 acres)	80.99
Nunn Sterling 1 Contractor Yard	Developed, Open Space (2.41 acres) Cultivated Crops (4.72 acres) Developed, Low Intensity (0.07 acre)	7.20
Nunn Bellmore Contractor Yard	Developed, Open Space (2.67 acres) Cultivated Crops (8.95 acres)	11.62
Nunn Sterling 2 Contractor Yard	Developed, Open Space (0.67 acre) Cultivated Crops (3.18 acres)	3.85
Carr Pipe Yard	Grassland/Herbaceous (36.01 acres) Cultivated Crops (17.41 acres) Barren Land (Rock/Sand/Clay) (4.72 acres)	58.14
Niobrara Staging Yard	Developed, Open Space (2.72 acres) Grassland/Herbaceous (33.45 acres)	36.17
Rockport Station Staging Yard	Grassland/Herbaceous (1.6 acres)	1.6
a/ The Enhancement Project would utilize the Rockport Station Staging Yard, and both Projects would utilize the Niobrara Staging Yard.		

The Lancaster, Latham, Mewbourn, O'Connor, and Connector M&R stations would be constructed either within existing natural gas facilities or would be directly adjacent to existing natural gas processing and compression facilities. The Lancaster and Connector M&R Stations would be placed entirely within existing industrial sites. The Mewbourn, Latham, and O'Connor M&R Stations would be constructed on undeveloped land and would represent a long-term conversion of agricultural and rangeland to industrial land uses. These aboveground facilities would affect land use and acreages as identified in table 11.

Public Land, Recreation, or Sensitive Land Areas

Neither the Pipeline Project nor Enhancement Project facilities cross or occur within 0.25 mile of any forest stands, specialty crops, natural areas, or national or state forests. There are no orchards, specialty crops, or coastal zone management areas near the Projects' facilities. No active mine locations are within 0.25 mile of the Projects' areas of disturbance (Colorado Division of Reclamation, Mining, and Safety, 2017). There are no national trails (National Recreation Trails, 2017), wilderness areas

(Colorado Wilderness Areas, 2017), or registered national landmarks (National Park Service, 2017a) that would be crossed or within 0.25 mile of the Projects' areas.

The Pipeline Project would be primarily on private land but would cross Colorado State Land Board managed lands, as well as public roads and railroads. The Colorado State Land Board-administered lands are in the southwestern quarter of Section 16 of Township 9 North; Range 66 West and in Section 36 of Township 4 North; Range 65 West. The Pipeline Project would not cross any federal lands, but a portion of the Connector Pipeline, from mileposts 57.8 to 59.2, would be 0.25 mile from the eastern boundary of the Pawnee National Grasslands. The southwestern corner of the Pawnee National Grassland is approximately 0.1 mile from the Pipeline Project (at Cheyenne Connector pipeline milepost 58.3). No temporary or permanent surface disturbance would occur within the Pawnee National Grassland or on any federally managed lands. The Projects are not within 0.25 mile of areas with travel restrictions or the Pawnee National Grassland Central Plains Experimental Range (U.S. Forest Service, 1999).

There are no known national parks, trails, wilderness areas, natural or scenic areas, or registered national landmarks that would be crossed or within 0.25 mile of the Projects' areas (National Park Service, 2017b).

The Pipeline Project would cross the Ault to Crow Valley Recreation Area section of the Pawnee Pioneer Trails Scenic and Historic Byway. The Byway is managed under the direction of the Corridor Management Plan (Pawnee Pioneer Trails, 1999). This highway has been designated as historic due to its scenic qualities, access to natural resources, and nearby cultural and recreational resources. The management plan does not identify any limitations for oil and natural gas development.

There are no known Native American Indian reservations, nature preserves, or flood control lands within 0.25 mile of the Projects.

Conservation Reserve Program (CRP) lands are properties that are withdrawn from crop production and converted to an herbaceous ground cover to conserve soil. Cheyenne Connector has identified two properties to be crossed that are enrolled in the CRP program. These are located at approximate mileposts 22 and 48. Cheyenne Connector would coordinate with individual landowners that own CRP enrolled lands crossed by the Pipeline to ensure that Program eligibility is not compromised by the Pipeline Project.

Agricultural Land

The Pipeline Project would affect 981.1 acres of land currently used for agricultural production. These areas may be removed from production for up to one growing season during construction. Cheyenne Connector has agreed to follow the provisions in the FERC Plan during construction and restoration. Factors applicable in agricultural areas include proper topsoil segregation, soil decompaction, soil additives,

rock removal, re-seeding, and weed control. Cheyenne Connector would also compensate landowners and/or agricultural tenants for the lost production caused by construction activities and any permanent conversion of land. The only permanent loss of agricultural production would be at the locations of the MLVs and aboveground facilities, where approximately 2.1 acres (total) of active agricultural land would be converted to pipeline facilities.

Cheyenne Connector is discussing the presence of drainage tiles with landowners during easement negotiations. The extent of existing drain tile present in the Pipeline Project area is undetermined; however, Cheyenne Connector has prepared a *Drain Tile Mitigation and Repair Plan* for use during Pipeline Project construction, which requires that all existing drainage tiles be repaired, replaced, or relocated with like-type materials to maintain existing drainage. Cheyenne Connector is including compensation for crop damage in easement negotiations.

The total acreage of rangeland crossed by the pipeline by is 568.4 acres; of this total area, 164.8 acres would be maintained as pipeline right-of-way. Mitigation measures would include coordination with landowners in efforts of implementing grazing restrictions timed around restoration and revegetation activities, installing fencing for pasture segregation where practicable, and conducting topsoil segregation per landowner direction.

Cheyenne Connector plans to conduct full width right-of-way topsoil segregation in all agricultural and rangeland areas; however, Cheyenne Connector is actively coordinating with landowners during its easement negotiations for the Pipeline Project, and would follow landowner stipulations related to width of topsoil segregation on a tract-by-tract basis.

A landowner, Mr. Benjamin Erickson, commented that the originally proposed Pipeline Project's construction right-of-way was to be sited within 120 feet of a barn where Mr. Erickson houses pregnant mares. Mr. Erickson expressed his concerns that the noise and vibration from construction in close proximity to the barn could be stressful to the mares and potentially cause the mares to abort their pregnancies. Mr. Erickson also expressed general safety concerns. To address Mr. Erickson's concerns, Cheyenne Connector altered its proposed Pipeline Project route in modifications filed on August 2, 2018, to avoid aboveground construction in close proximity to the barn.

A number of landowners, including George Tateyama, Maria Petrocco, and Leslie Peterson, commented that based on their discussion with company land agents, Cheyenne Connector has not properly considered the repair of damage to irrigation and drain tile systems, pipeline depth of burial to avoid interference with farming practices and drain and irrigation systems, post-construction soil compaction testing, and crop damage compensation. While Cheyenne Connector has committed to follow the measures in our Plan and has prepared a *Drain Tile Mitigation and Repair Plan*, we do not believe these commitments adequately address the concerns expressed above. We agree that a firmer

commitment from Cheyenne Connector is warranted, for protection of agricultural resources and to ensure that farming practices and related land uses can resume to preconstruction levels after construction. **Therefore, we recommend that:**

- **Prior to construction, Cheyenne Connector should file with the Secretary, for review and written approval of the Director of OEP, an Agricultural Impact Mitigation Plan in consultation with the Platte Valley and West Greeley Conservation Districts that identifies the measures to be used by Cheyenne Connector to avoid damage to agricultural resources, compensate landowners for damage to crops or lost production, and to monitor the success of the mitigation. The Plan should address issues such as depth of cover; restoration measures, including decompaction; timing of construction during crop seasons; and identification, repair, and monitoring of drain tile/irrigation systems.**

Due to Cheyenne Connector's proposed mitigation measures for construction and restoration in agricultural areas (including the use of our Plan), and due to our recommendation, we conclude that impacts on agricultural land would not be significant.

Landfill and Hazardous Waste Sites

Cheyenne Connector and Rockies Express conducted a regulatory database search to determine whether there are any landfills or hazardous waste sites within 0.25 mile of the Project facilities. No landfills or hazardous waste disposal sites are within 0.25 mile of the Projects' areas. Fifteen oil and natural gas production locations are within 0.25 mile; with 3 of the 15 being associated with the existing Anadarko Lancaster Gas Processing Plant near MP 0.0. These existing oil and gas production facilities do not have any records of regulatory violations.

Ten locations within 0.25 mile were identified as containing aboveground storage tanks for agricultural use, a recycling and biogas facility, or other registered facilities near the pipeline alignment, but no regulatory violations were reported for these locations.

Residential Land and Commercial Areas

The Pipeline Project facilities would cross agricultural, rangeland, and rural residential areas. The southern portion of the Pipeline Project area is within the Denver-Julesburg Oil and Natural Gas Basin, which contains a dense network of oil and natural gas wells, tank batteries, and processing facilities. Structures near the proposed pipeline and M&R stations are primarily scattered residences, cattle ranching and livestock facilities, and industrial sites associated with oil and natural gas recovery and processing.

There are five residences within 50 feet of the edge of a pipeline construction area (table 13), one of which is within 25 feet of an existing gravel road proposed to be used

as a TAR. Cheyenne Connector states it will work with the landowner concerning any site-specific access issues or road use conflicts.

Table 13
Structures Within 50 Feet of Pipeline Project Construction Work Areas

Stationing/ Facility	Structure Type	Distance from Construction Work Area (feet, approximate)	Distance from Pipeline Centerline (feet, approximate)
TAR-022 a/	Residence	18	2,200
TAR-045 a/	Residence	47	1,085
TAR-053 b/	Residence	29	2,243
Test Break Area #3	Residence	49	499
ATWS-194	Residence	32	177

a/ An existing gravel road for access to these construction work areas would be improved but would not include new disturbance.
b/ An existing two-track road for access to this construction work area would be improved, requiring limited disturbance.

Cheyenne Connector states it would implement the following mitigation measures for the Pipeline Project for all residences within 50 feet of a construction work area (i.e., those listed in table 13):

- avoiding the disturbance or removal of mature trees and landscaping from within the edge of the construction work area unless necessary to safely operate construction equipment or as specified in landowner agreements;
- restoring all lawn areas and landscaping within the construction work area immediately after cleanup operations, or as specified in landowner agreements, consistent with the requirements of the Plan;
- installing safety fence along the edge of construction work area adjacent to the residence for a distance of 100 feet on either side of the residence to ensure that construction equipment and materials, including the spoil pile, remain within the construction work area; and
- maintaining fencing at a minimum throughout active construction in the area.

Where possible, Cheyenne Connector would maintain a minimum of 25 feet between the residence and the construction work area for a distance of 100 feet on either side of the residence.

No residences or other buildings are within 50 feet of the Enhancement Project's proposed construction work areas.

The Projects would not result in permanent affects to residential land; however, construction could result in short-term impacts on nearby residential areas. Such impacts could include increased construction-related traffic on local roads, as well as increased dust and noise. We conclude that implementation of Cheyenne Connector's proposed construction methods for working in proximity to residences and commitments expressed

above would minimize disruption on residents within close proximity to construction to the extent practicable. Further, Cheyenne Connector's implementation of the FERC's Plan would facilitate restoration within any residential areas as soon as reasonably possible upon completion of construction.

Visual Resources

Impacts on visual and/or aesthetic resources would primarily occur during construction as a result of the presence of construction equipment. The visual character of the Projects' areas is typically a rural landscape with flat terrain modified for agricultural use. The northern portions of the Pipeline Project area (as well as the Enhancement Project area) are natural, high arid grasslands. Agricultural uses dominate the central portion of the Pipeline Project area; and a moderate to dense network of oil and natural gas production facilities characterizes the southern portion of the Pipeline Project area. No special or unique scenic features are known to occur in the Projects' areas, nor are there any designated scenic areas or views. Most impacts on visual resources would be temporary; however, the construction of the new aboveground M&R facilities would create some minor permanent impacts on the visual landscape.

Public roadways are within view of the Pipeline Project's proposed right-of-way and aboveground facilities, as well as Rockies Express' existing Cheyenne Hub facilities and the Enhancement Project site. The construction of the Cheyenne Connector pipeline within its new easement would not result in a permanent alteration of visual resources. The addition of the new aboveground facilities associated with the Pipeline Project at or adjacent to existing natural gas plants, and the development of new compression facilities associated with the Enhancement Project at the existing Cheyenne Hub facility, would not significantly affect the visual character of the area surrounding these facilities.

6. Socioeconomics and Environmental Justice

The Projects' activities would take place in Weld County in a rural setting where low- to medium-density, single-family detached dwellings and a mix of agricultural and open spaces dominate the surrounding landscapes.

Greeley, within Weld County, is about 10 miles west of the Pipeline Project area and is the nearest major city to both Projects.

The Enhancement Project facilities would be sited at Rockies Express' existing Cheyenne Hub in an area of rangeland and open space approximately 35 miles north of Greeley.

The following sections provide the socioeconomic setting for the county, cities, and communities that may be affected by construction and operation of the proposed Projects. All population data are referenced from the U.S. Census Bureau 2010 and/or 2016; and housing, income, and employment data come from U.S. Census Bureau 2015.

Population, Employment, and Housing

The Projects' construction and operation would occur entirely within Weld County. Unless otherwise indicated, all population data presented in this section were obtained from the U.S. Department of Commerce, Bureau of the Census (2010). Weld County had a population of 252,825 in 2010 and a population density of about 63.4 people per square mile. The State of Colorado had a population of 5,029,196 in 2010 and a population density of 48.5 people per square mile.

Table 14 provides civilian labor force statistics, unemployment rates, and major industries in the communities in the area surrounding the Projects' sites. Weld County has an average civilian labor force of 138,574, representing approximately 54.8 percent of the population. The average unemployment rate in Weld County is 6.6 percent, compared to Colorado's statewide unemployment rate of 6.9 percent. The city of Greeley has an average civilian labor force of 47,807, representing approximately 51.4 percent of the population. The average unemployment rate in the city of Greeley is approximately 9.0 percent, compared to the statewide unemployment rate of 6.9 percent.

Table 14 Socioeconomic Conditions of the Projects' Areas				
State/County	**Average Per Capita Income (U.S. Dollars) 2015 a/**	**Total Civilian Labor Force (Persons) 2015 a/**	**Unemployment Rate (percent) 2015 a/**	**2015 Major Employment by Industry (Percent) a/**
Colorado				
State of Colorado	32,217	2,820,014	6.9	Educational services, and health care and social assistance (20.5)
Weld County	26,751	138,574	6.6	Educational services, and health care and social assistance (20.1)
Nearby Colorado Communities				
Nunn	20,354	291	9.6	Manufacturing (15.2)
Ault	22,494	847	9.7	Educational services, and health care and social assistance (19.0)
Eaton	28,282	2,286	2.4	Educational services, and health care and social assistance (17.6)
Greeley	22,716	47,807	9.0	Educational services, and health care and social assistance (21.9)
Kersey	21,873	736	6.9	Educational services, and health care and social assistance (22.9)
Platteville	25,070	1,364	5.9	Educational services, and health care and social assistance (14.8)
Fort Lupton	19,363	3,695	6.5	Educational services, and health care and social assistance (21.3)
a/ U.S. Census Bureau, 2011-2015 Five-Year American Community Survey Estimates.				

Impacts on the local population would primarily result from the short-term influx of temporary employees during construction. Cheyenne Connector and Rockies Express anticipate that about 50 percent of the workforce could come from outside of the affected counties, based on the makeup of the construction workforce in nearby communities as referenced in table 15 below. Temporary increases in population levels would occur as workers with specialized skills move into the area. Even if the entire construction workforce for the Projects come from outside the local area, this would represent a negligible increase in the population of the communities surrounding the Projects' sites.

Cheyenne Connector and Rockies Express anticipate that the workforce throughout the duration of construction for each of the Pipeline and Enhancement Projects would be 580 people and 150 people, respectively. Both Applicants would hire local and regional construction workers to the extent feasible, and anticipate that approximately 50 percent of the construction workforce would be drawn from local

communities. However, if the local workforce does not possess the skills required, specialized workers would be brought in from outside the local area.

During construction, the hiring of local labor would have a net positive impact on employment in the Projects' areas, where county and city unemployment rates range from 2.4 to 9 percent. The influx of construction workers may also have the added benefit of generating increased work opportunities in local service industries (e.g., restaurants, drop-off laundry services, cleaning services, etc.). Due to the anticipated small size of the work force in each Project area compared to the existing population and work force, construction period impacts on population and employment are expected to be minor. Because only eight permanent employees would be hired for the Projects' facilities, permanent or long-term impacts on employment are expected to be negligible.

Table 15
Estimated Population Impacts of the Projects

Community	Total civilian labor force a/	Project	Construction Personnel			Additional Operations Personnel	
			Average Number b/	Peak Number	Percent Change c/	Number	Percent Change
State of Colorado	2,820,014	Pipeline Project	580	580	0.00	2	0.00
Weld County	138,574				<0.01		<0.01
State of Colorado	2,820,014	Enhancement Project	150	150	0.00	6	0.00
Weld County	138,574				<0.01		<0.01

a/ U.S. Census Bureau, 2010.

b/ Due to the Projects' relatively short estimated 7-month-long construction period, the average and peak quantities are assumed to be the same.

c/ Percent change based on peak number of construction personnel.

Table 16 provides an overview of the housing characteristics within areas affected by the proposed Projects. Vacancy rate data may not reflect exact current conditions. The vacancy rate for Weld County is 1.1 percent for owner-occupied units and is 1.3 percent for 4.0 percent for rental units. The city of Greeley has a vacancy rate of 1.3 percent for owner-occupied units and a rate of 5.1 percent for rental units.

Table 16 Housing Characteristics in Projects' Areas a/				
County/ Community	**Total Housing Units 2015**	**Occupied Housing Units 2015**	**Vacant Housing Units 2015**	**Average Homeowner Vacancy Rate (percent) 2015**
Colorado				
Weld County	99,226	94,294	4,932	1.1
Weld County Communities near the Projects' Areas				
Nunn	231	206	25	2.3
Ault	668	623	45	0.4
Eaton	1,562	1,546	16	1.3
Greeley	35,996	33,774	2,222	1.3
Kersey	571	520	51	2.3
Platteville	912	867	45	2.9
Fort Lupton	2,601	2,407	194	0.0
a/ U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates.				

Table 17 provides an overview of temporary housing availability within the Projects' areas. We note that typically, construction workers opt for more temporary accommodations such as short-term rental units (hotels, motels, and apartments), trailers, recreational vehicles, and campgrounds, rather than houses. Availability would vary based on location and distance of Projects' worksites from the temporary accommodations. Additionally, availability of temporary housing would vary based on seasonal patterns.

Table 17 Temporary Housing in the Projects' Areas					
County/State	**Rental Vacancy Rate (percent) 2015 a/**	**2017 Hotels/Motels b/**	**Estimated Number of Hotel/Motel Rooms**	**Mobile Homes 2015 a/**	**Estimated Number of Campgrounds and Recreational Vehicle Parks**
Colorado					
Weld County	4.0	27	>1,061	7,198	--
Weld County Communities near the Projects' Areas					
Nunn	0.0	0	--	27	0
Ault	0.0	0	--	92	0
Eaton	0.0	1	45	0	0
Greeley	5.1	23	>900	1,912	1 (172 sites)
Kersey	12.2	1	43	78	1 (unknown # of sites)
Platteville	0.0	0	--	81	0
Fort Lupton	7.8	3	73	105	0
a/ U.S. Census Bureau, 2011-2015 Five-Year American Community Survey Estimates. b/ Hotel search using Google search engine, www.google.com, 2017.					

During construction of the Projects, the Applicants estimate that about 50 percent of the workforce would come from outside of the local communities, and would likely reside in such temporary housing in the towns/cities surrounding the Projects' sites. Locally hired workers would commute daily to the construction site from their houses.

Impacts on available housing and lodging would be temporary and would last only for the duration of construction activities (estimated at approximately 7 months). As shown in table 14, there are approximately 27 hotels or motels near the proposed Project, most of which are in Greeley, which is approximately 7 miles east of the proposed pipeline and 35 miles south of the Cheyenne Hub facility. Additionally, the rental vacancy rate in Greeley is relatively higher than the vacancy rate for Weld County, which indicates that there are additional residency options for the non-local construction workforce. Given the assumption that approximately half of the construction workforce would be hired from the local workforce, the need for temporary housing for construction workers is relatively low, and would be accommodated by the number of available hotels/motels and vacancy rates in the Projects' areas.

The communities in the Projects' areas have multiple housing options to accommodate the eight new permanent personnel hired to operate the facilities. Temporary and long-term/permanent impacts on housing are expected to be negligible.

6.1 Economy

Current economic and employment conditions in Weld County and nearby communities were presented in table 6 above. The 2015 estimated per capita income for Weld County, Colorado was $26,751. This average per capita income was slightly lower than the estimated 2015 per capita income for the State of Colorado at $32,217. For nearby communities the 2015 estimated per capita incomes were all lower than the state's estimated per capita income.

Employment in the areas near the proposed Project is predominately in educational services, health care, and social assistance, typically followed by construction and manufacturing or else by professional, scientific, and management and administrative and waste management services. Unemployment rates in Weld County were slightly lower than the statewide unemployment rate. Unemployment rates in the nearby communities of Nunn, Ault, and Greeley were higher than the state and countywide unemployment rates. Eaton, Colorado had an unemployment rate that was significantly lower than the statewide unemployment rate.

<u>Construction Payroll and Material Purchases</u>

Construction activities would have a net positive impact on local and regional businesses, based on our assumption that construction workers would spend as much as 20 to 30 percent of their paychecks on goods, services, and entertainment, in addition to money spent on temporary housing by non-local workers. Based on information for

projects of similar size, Cheyenne Connector estimates that during construction of the Pipeline Project, the construction worker payroll would be approximately $77,000,000 for pipeline construction and $14,000,000 for construction of the M&R stations, and estimates that construction personnel would spend $10,579,000 for local goods and services during the 7-month construction period. Also during construction of the Pipeline Project facilities, Cheyenne Connector estimates it would purchase approximately $72,000,000 of construction materials, fuel, and equipment.

Rockies Express estimates the payroll for the Enhancement Project construction personnel to be approximately $24,000,000. Construction workers would spend roughly $2,736,000 for local goods, services, and entertainment. Local and/or regional businesses would also see increased revenues from an estimated $49,000,000 in construction material, equipment, and fuel purchases related to the Enhancement Project.

Tax Revenues

Construction and operation of the Projects would result in short and long-term increases in tax revenues for the state and for Weld County. During the construction period, the Applicants estimate that sales tax receipts from construction worker spending would result in receipts of $306,797 from the Pipeline Project and $79,344 from spending on the Enhancement Project, based on a sales tax rate of 2.9 percent. Income taxes receipts on the payroll for each Project would total $2,106,650 for the Pipeline Project and $555,600 for the Enhancement Project based on the Colorado marginal tax rate of 4.63 percent. Additional sales taxes would be paid on the material and equipment purchases by Cheyenne Connector and Rockies Express in the amounts of $2,088,000 and $1,421,000, respectively.

Once in operation, Cheyenne estimates that annual property tax revenue for Weld County associated with the Cheyenne Connector would be approximately $416,288. Rockies Express estimates that it would pay approximately $265,405 in property taxes for the Cheyenne Hub facilities each year.

6.2 Public Services

Construction of the Projects could result in a temporary increased demand on local public services, such as medical, fire, police, and education services (see table 18). Potential temporary impacts on services could include traffic-related incidents, medical emergencies, increases in traffic violations, and issuances of permits for construction vehicles subject to load and width restrictions. During construction, up to 580 workers for the Pipeline Project and up to 150 workers combined for the Enhancement Project would be present during peak construction periods. Non-local workers would likely obtain housing in the surrounding communities; however, it is unlikely that all personnel would locate into a single community or municipality.

Impacts on medical facilities could include injuries or illnesses that may occur to construction workers. According to the U.S. Bureau of Labor Statistics (2016), the number of recordable injuries and illnesses for the oil and gas pipeline construction industry is about 0.7 per 100 full-time workers. Therefore, any Project-related increase in demand for medical facility services would not be expected to exceed the capacity or level of service provided by existing medical facilities in the Projects' areas.

Table 18
Public Services in the Projects' Areas and Nearby Communities

County/Community	Police/Sheriff Departments a/	Fire and Rescue Departments b/	Medical Facilities c/, d/, e/
Colorado			
Weld County	19	10	20+
Weld County Communities near the Projects' Areas			
Nunn	1	0	0
Ault	1	1	0
Eaton	1	0	1 (approx. 30 beds at urgent care)
Greeley	1	1	3 (approx. 300 hospital beds)
Kersey	1	0	0
Platteville	1	1	0
Fort Lupton	1	1	0

a/ USA Cops, www.usafireandresuce.com, 2017.
b/ USA Fire and Rescue, www.usafireandrescue.com, 2017.
c/ Google Earth Medical Facility Search, www.googleearth.com, 2017.
d/ The term "medical facility" is limited to county health centers, county hospitals, district hospitals, hospitals, and regional medical centers.
e/ The Applicants placed calls to the hospitals and urgent care clinics in the Projects' areas to obtain approximate bed counts.

Although the potential for police, fire, and medical services may increase slightly during construction activities, adequate public services exist in the Projects' areas to handle a civil, criminal, or emergency event. Furthermore, there would be no large influx of workers. It is anticipated that the limited number of non-local construction workers would not relocate with school-age children due to the relatively short duration of construction activities. For these reasons, impacts on public services during construction are expected to be negligible.

6.3 Traffic and Transportation

Transportation systems in the Projects' areas include a network of local and state roadways. The Projects' facilities are in predominately rural areas intermixed with industrial operations (primarily other oil and gas operations) as well as small rural communities that are close to nearby larger population centers. Most of the county and residential roads near the Projects' areas are gravel and/or dirt. A total of 90 new or existing access roads would be constructed or improved for temporary access to the

Cheyenne Connector pipeline right-of-way (see section B.5), and would be returned to their previous land use after construction. Nine PARs would be constructed to allow access to the Pipeline Project's five M&R stations and three MLVs.

Access to the Cheyenne Connector pipeline, M&R stations, and MLVs would be primarily from Weld County roads. The main point of access for the Lancaster M&R Station would be from Weld County Road (WCR) 22, the Mewbourn M&R Station would be accessed from WCR 35, the O'Connor M&R Station from WCR 51, and the Connector M&R Station from CSH 51 at the existing Cheyenne Hub.

In general, construction crews would work 6 days a week during the 7-month construction phase of the Projects. However, variables in equipment availability, material supplies, and weather delays may result in personnel and equipment deliveries to Project sites seven days a week to meet Project schedules. Cheyenne Connector expects to control admittance to the Projects' areas and that vehicle access would be limited to the designated access roads and entry points. To maintain safe conditions, Cheyenne Connector and Rockies Express would direct their construction contractors to ensure enforcement of local weight restrictions and limitations for construction vehicles accessing the Project areas. Movement of construction equipment, materials, and crew members would result in a short-term impact on the local transportation network. Impacts on traffic levels at any given location are not expected to be significant due to the dispersed nature of the Projects' work sites. Although construction workers would commute to and from the Projects' areas from their permanent homes or from temporary housing or hotels/motels in local and outlying towns and cities, this would typically begin before sunrise and end after sunset, times of the day when daily local traffic is reduced from peak levels.

Construction of the Projects would result in daily increases in traffic during the approximate 7-month construction period; however, impacts would be minor and short-term due to the geographic spread of the Projects' activities and timing of traffic.

The Enhancement Project site is accessed from CSH 85 by an existing driveway. The average annual daily traffic for CSH 85 in 2016 was 2,700 vehicles, of which about 23.5 percent were trucks (Colorado Department of Transportation, 2018). To facilitate access to the Enhancement Project to the west of the existing Cheyenne Hub, Rockies Express would construct one new TAR running north parallel to CSH 85 and then west to the Cheyenne Hub expansion area.

Rockies Express estimates that 30 construction worker vehicles and 5 trucks delivering equipment and materials would access the Enhancement Project site each day during the construction period. Construction work would take place 6 days per week for approximately 7 months. The movement of construction personnel, equipment, and materials to the Enhancement Project work areas would result in short term, minor impacts restricted to the site access off CSH 85. CSH 85 has low average annual daily traffic levels, and Project construction working hours and deliveries would usually occur

during off-peak hours. We anticipate that workers would also be carpooling to the worksite, which would help keep Project-related traffic to a minimum. Appropriate traffic control measures, such as flagmen and signs, would be used at the site access as necessary to ensure safety of local traffic.

Additionally, the Applicants would coordinate with state and county officials to obtain all necessary permits for temporary construction-related impacts on roadways in the Projects' areas. As a result of these measures, traffic is not expected to be significantly impacted by construction of the Projects. Based on the temporary and short-term potential traffic interruptions, we conclude that impacts from construction traffic related to the Projects would be minor.

The Pipeline Project would not have any measurable impacts on road congestion during operation as the two new permanent pipeline workers would represent an immeasurable increase in amount of vehicle traffic in the Project area. Rockies Express estimates that six new workers would be hired to operate the new Enhancement Project facilities. Occasional site visits and equipment deliveries by specialized personnel to the Enhancement Project's modified Cheyenne Hub facilities would be required for routine operation and maintenance. The impacts on traffic and transportation routes from personnel commuting and occasional maintenance site visits to the aboveground Cheyenne Connector facilities and the new Cheyenne Hub Booster Compressor Station would be negligible.

6.4 Environmental Justice

For projects with major aboveground facilities, FERC regulations (18 CFR 380.12(g)(1)) direct us to consider the impacts on human health or the environment of the local populations, including impacts that would be disproportionately high and adverse for minority and low-income populations.

In its guidance for the consideration of environmental justice under NEPA, the CEQ defines a "minority" as an individual who is American Indian or Alaskan Native, Black or African American, Asian, Native Hawaiian or Pacific Islander, or Hispanic or Latino. The CEQ characterizes a "minority population" as existing in an affected area where the percentage of defined minorities exceeds 50 percent of the population, or where the percentage of defined minorities in the affected area is meaningfully greater (10 percentage points higher) than the percentage of defined minorities in the general population or other appropriate unit of geographic analysis (CEQ, 1997a; EPA, 2016). Table 19 presents the population characteristics of the Projects' areas.

The Pipeline Project would be constructed through 10 different Census Tracts in Weld County. The Enhancement Project site is in Census Tract 25.01 in Weld County.

None of the census tracts affected by the Projects have a minority population that exceeds the 50 percent minority threshold identified by CEQ; however, one Census Tract, Tract 19.02, has a meaningfully greater (at least 10 percent higher) minority population than the level in Weld County.

Table 19
Demographics in the Projects' Areas

County/State (Project Facility)	Total Population	Race as a Percentage of Total Population a/								Total Minority Population (Percentage)	Population below Poverty Level (Percentage)
		White	African American	American Indian and Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Persons Reporting Two or More Races	Persons of Hispanic or Latino Origin b/	Some Other Race		
State of Colorado	5,359,295	84.3	4.1	0.9	2.9	0.1	3.4	21.1	4.2	31.0	12.2
Weld County	278,065	87.5	1.1	0.8	1.3	0.1	2.8	28.8	6.4	33.3	12.6
Census Tracts Along Cheyenne Connector Pipeline Route and within 1 Mile of Aboveground Facilities											
Census Tract 7.05 (Pipeline, O'Connor M&R Station)	1,434	70.1	0.0	0.9	0.6	0.0	1.4	34.2	27.0	36.7	13.2
Census Tract 15 (Pipeline)	7,047	94.6	0.8	0.4	0.4	0.0	2.0	16.9	1.9	19.0	7.2
Census Tract 16 (Pipeline, O'Connor M&R Station)	4,788	91.5	0.4	0.0	0.0	0.0	1.3	27.2	6.8	27.5	8.9
Census Tract 17 (Pipeline, Mewbourn and Latham M&R Stations)	5,115	93.5	0.0	0.1	0.8	0.0	1.3	39.9	4.2	41.7	18.2
Census Tract 18 (Pipeline, Lancaster M&R Station, Mewbourn and Latham M&R Stations)	4,449	91.5	0.0	0.8	0.9	0.0	2.6	32.0	4.3	35.6	15.2
Census Tract 19.02 (Pipeline, Lancaster M&R Station)	7,400	84.2	1.7	2.6	0.4	0.0	3.0	38.0	8.0	43.5	17.6
Census Tract 19.06 (Lancaster M&R Station)	1,455	81.6	0.8	1.7	0.0	0.0	1.2	30.9	14.7	33.7	4.0
Census Tract 23 (Pipeline)	5,017	94.6	0.0	0.3	0.1	0.0	2.2	23.9	2.8	24.8	12.7
Census Tract 25.01 (Cheyenne Hub, Pipeline, Connector M&R Station)	4,873	95.0	0.3	0.8	0.2	0.0	3.3	9.4	0.3	12.4	14.3
Census Tract 25.02 (Pipeline)	6,147	93.7	0.1	0.2	0.1	0.0	0.9	29.8	4.9	31.0	19.6

a/ Source: U.S. Census Bureau, 2015.
b/ People who identify their origin as Hispanic or Latino may be of any race. Thus, the percent Hispanic or Latino should not be added to the race as percentage of population categories.

The CEQ guidance further recommends that low-income populations in an affected area should be identified using data on income and poverty from the U.S. Census Bureau (CEQ, 1997b). Low-income populations are populations where households have an annual household income below the poverty threshold, which is currently $24,600 for a family of four. Table 20 provides the percentage of population living below the poverty level in the Projects' areas.

Table 20
Percentage of Population Living Below the Poverty Level in the Projects' Areas

Project	Community	Percentage of Population Below Poverty Level	Project Facilities
Pipeline Project including the Cheyenne Connector Pipeline (including MLVs) and M&R Stations	State of Colorado	12.2	N/A
	Weld County	12.6	N/A
	Census Tract 7.05	13.02	Pipeline, O'Connor M&R Station
	Census Tract 15	7.2	Pipeline
	Census Tract 16	8.9	Pipeline, O'Connor M&R Station
	Census Tract 17	18.2	Pipeline, Mewbourn and Latham M&R Stations
	Census Tract 18	15.2	Pipeline, Lancaster M&R Station, Mewbourn and Latham M&R Stations
	Census Tract 19.02	17.6	Pipeline, Lancaster M&R Station
	Census Tract 19.06	4.0	Lancaster M&R Station
	Census Tract 23	12.7	Pipeline
	Census Tract 25.01	14.3	Pipeline, Connector M&R Station at Cheyenne Hub
	Census Tract 25.02	19.6	Pipeline
Enhancement Project	Census Tract 25.01	14.3	Cheyenne Hub

a/ Source: U.S. Census Bureau, 2015.

None of the census tracts affected by the Projects in table 20 above has a low income population that exceeds the 50 percent of the total population; however, five census tracts contain a meaningfully greater population of residents living below the poverty line than Weld County. Residents in these tracts may be affected by the construction and operation of the Cheyenne Connector or the Cheyenne Hub. In general,

the Projects' areas in Weld County are in rural, low density areas with only a few, scattered residences near the proposed pipeline construction corridor.

The types of impacts that could affect the low income population within these census tracts include air quality, noise impacts, and aesthetics. Air quality impacts from construction of the Projects, further discussed in section B.8.1, would result in a short period of minor impacts on local ambient air quality, mainly due to exhaust from the larger construction equipment, as well as fugitive particulates from earthmoving and land filling/dumping activities, as well as traffic. These impacts are typically small and localized, as these emissions will be very near to or at ground level. Additionally, these impacts would only occur for a short period. The Applicants would comply with the FERC Plan and with state regulations that address fugitive dust impacts from construction activities, further described in section B.8.4.

Noise from on-site construction activities that may occur near these low income populations would be limited to short durations over a period of 3 to 4 weeks at any one location based on the nature of Cheyenne Connector pipeline right-of-way construction sequencing, and for longer periods up to 7 months at each of the aboveground facility construction sites. See section B.8.2 for a discussion of construction-related noise.

Aesthetically, the Cheyenne Connector pipeline is unlikely to be visible from any residence over the long term, as the pipeline would be buried and the ground surface would be restored, thus not creating a new visual element in the landscape. The new M&R stations would be constructed in proximity to natural gas processing plants, and would be consistent with these existing uses.

The Cheyenne Connector M&R Station as well as the Enhancement Project facilities (including the Cheyenne Hub Booster Compressor Station) would be constructed within the existing Cheyenne Hub facility in Census Tract 25.01. The Cheyenne Hub is situated in a rural, undeveloped part of Weld County, and as described in sections B.8.1 and B.8.2, the operation of the modified Cheyenne Hub facilities following the Projects' construction would not cause any adverse effects to existing ambient air quality or noise levels. Because the Enhancement Project's facilities would be encompassed within Rockies Express' existing Cheyenne Hub, there would be no visual, land use, or other effects on the low income population of Census Tract 25.01.

As described throughout this EA, the Projects would not have a significant adverse impact on the environment or on individuals living in the Projects' areas. Therefore, the Projects would not have a disproportionately high adverse environmental or human health impact on minority or low-income residents.

6.5 Property Values and Easement Negotiations

We received comments expressing concerns about how the construction and operation of the Pipeline Project may result in potentially adverse effects on property

values. Affected landowners who believe that their property values have been negatively impacted could appeal to the local tax agency for reappraisal and potential reduction of taxes. The impact that a natural gas project could have on the value of any land parcel depends on many factors. These include the size of the parcel, the parcel's current value and land use, and the value of other nearby properties. However, subjective valuation is generally not considered in appraisals. This is not to say that the Pipeline Project would not affect resale values. Potential purchasers may make a decision based on intended future use and, if the presence of a natural gas project's facilities in the general area would make that use undesirable, it is possible that the potential purchaser would not acquire that parcel. However, each potential purchaser has differing criteria and means.

We also received comments regarding the easement negotiation process for the Pipeline Project. Pipeline operators must obtain easements from existing landowners to construct and operate authorized facilities, or acquire the land on which the facilities would be located. Easements can be temporary, granting the operator the use of the land during construction (e.g., extra workspaces, temporary access roads, contractor yards), or permanent, granting the operator the right to operate and maintain the facilities once constructed.

Cheyenne Connector would need to acquire new easements or acquire the necessary land to construct and operate the new pipeline and associated aboveground facilities. These new easements would convey both temporary (for construction) and permanent (for operation) rights-of-way to Cheyenne Connector.

An easement agreement between a company and a landowner typically specifies compensation for losses resulting from construction, including losses of non-renewable and other resources, damages to property during construction, and restrictions on existing uses that would not be permitted on the permanent right-of-way. Compensation would be fully determined through negotiations between Cheyenne Connector and the landowner.

If an easement cannot be negotiated with a landowner and if the Projects are approved by the Commission, Cheyenne Connector may use the right of eminent domain to acquire the property necessary to construct and operate its pipeline. This right would apply to all Project-related workspaces covered by an approval, including the temporary and permanent rights-of-way, aboveground facility sites, contractor yards, access roads, and extra workspaces. Cheyenne Connector would still be required to compensate the landowner for the right-of-way and damages incurred during construction. However, the level of compensation would be determined by a court according to federal or state law.

7. 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 (NRHP), and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment.

Cheyenne Connector and Rockies Express, as non-federal parties, are assisting the FERC in meeting our obligations under Section 106 and its implementing regulations at 36 CFR 800.

7.1 Enhancement Project

Rockies Express completed a cultural resources survey for the Enhancement Project, and provided the resulting *Phase Limited Results Cultural Resources Review Form* to the FERC and Colorado State Historic Preservation Office (SHPO). Approximately 85 acres were surveyed, and no cultural resources were identified. In a March 16, 2018 letter, the SHPO concurred that no historic properties would be affected by the Enhancement Project. We also concur.

Rockies Express contacted the following Native American tribes regarding the Enhancement Project, providing a project description and mapping, and also followed-up with the tribes: Apache Tribe of Oklahoma; Cheyenne and Arapaho Tribes; Cheyenne River Sioux Tribe; Comanche Nation of Oklahoma; Crow Creek Sioux Tribe; Fort Sill Apache Tribe; Kiowa Tribe of Oklahoma; Northern Arapaho Tribe; Northern Cheyenne Tribe; Oglala Sioux Tribe; Rosebud Sioux Tribe; Southern Ute Indian Tribe; Standing Rock Sioux Tribe; Ute Indian Tribe; and Ute Mountain Ute Tribe. In a letter dated March 23, 2018, the Northern Cheyenne requested a copy of the survey report, which Rockies Express provided. No other responses have been received. We sent our NOI to these same tribes. No responses to our NOI have been received from the tribes.

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

7.2 Pipeline Project

Cheyenne Connector completed a cultural resources survey for the Pipeline Project, and provided the resulting *Class III Cultural Resource Inventory* report (Class III report) to the FERC and Colorado SHPO. Approximately 3,125.3 acres were surveyed, including a generally 250-foot-wide corridor for the Cheyenne Connector pipeline, expanded as necessary, as well as access roads, extra workspace, and contractor yards. As a result of the survey, 141 cultural resources were identified. These included 98 newly recorded segments of 79 historic linear sites (36 previously recorded linear sites and 43 newly recorded linear sites), 13 previously recorded non-linear sites, 8 newly recorded non-linear sites, and 22 newly recorded isolated finds. The linear sites included 44 county roads, 4 highways, 11 historic side roads, 2 railroads, 17 irrigation ditches, and 1 transmission line. Non-linear sites included 10 historic sites (7 homesteads/farmsteads/ habitation, 1 field irrigation system, and 2 trash scatters), 8 pre-contact sites (4 open camps, 2 open lithic scatters, and 2 stone circle/cairn sites), and 3 multicomponent sites (1 pre-contact open camp and historic farmstead, 1 pre-contact open camp and historic trash dump, and 1 pre-contact open lithic scatter and historic trash dump).

Of the 79 linear sites crossed by the Pipeline Project, 75 are either eligible for the NRHP or "need data," and 4 are recommended as not eligible in their entirety. Because Cheyenne Connector would avoid all supporting segments of linear sites by boring or HDD, or pass through non-contributing segments, Cheyenne Connector recommended that the Pipeline Project would have no adverse effect on these resources. Of the non-linear sites, three were recommended eligible for the NRHP. For two of these sites, both pre-contact open camps, the Pipeline Project would pass through portions of the sites that were non-contributing to NRHP eligibility. The third site, a farm, would be avoided by HDD. An existing, non-historic road through the residential portion of the farm is proposed for Pipeline Project use; however, Cheyenne Connector recommended that temporary use of the road would not impact the historic integrity of the farm. The remaining non-linear sites were recommended as not eligible for the NRHP; however, two of these sites were of a site type of concern to Native American tribes and have been avoided by reroutes. All of the isolated finds were recommended as not eligible for the NRHP.

In a letter dated March 26, 2018, the Colorado SHPO concurred with the recommendations in the report, but requested additional information. Cheyenne Connector provided the SHPO and FERC with a revised Class III report addressing the SHPO's comments. In a letter dated June 21, 2018, the SHPO indicated the revised report satisfactorily addressed its prior comments, and concurred with the eligibility recommendations in the revised report. Further, the SHPO agreed with the recommendations to avoid or minimize the effects to historic properties as described in the revised report. The SHPO concluded that the Pipeline Project would result in no adverse effect to historic properties. We concur.

Subsequently, Cheyenne Connector provided an Addendum I Class III report for four reroutes, two access roads, additional workspace, and other modifications to its proposed Pipeline Project. As a result of the survey, five previously recorded linear sites were revisited and expanded. These included three county roads and two irrigation ditches. The three roads were recommended as "needs data," and the newly expanded segments were considered non-contributing. The two ditches were recommended as eligible for the NRHP, and the expanded segments were recommended as supporting the eligibility of the entire resource. Cheyenne Connector would avoid all of these resources by bore or HDD. The report also identified some areas that remained to be surveyed due to denied access. In a letter dated August 30, 2018, the SHPO commented on the addendum and indicated the prior determinations and findings for the Pipeline Project remained unchanged.

As noted above, some survey remains outstanding. **Therefore, we recommend that:**

- **Cheyenne Connector should <u>not begin construction</u> of Pipeline Project facilities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads <u>until</u>:**

  a. Cheyenne Conn9ector files with the Secretary:

  (1) an addendum survey report for the outstanding survey areas, and the SHPO's comments on the addendum report;

  (2) any required avoidance/treatment plan, and the SHPO's comments on any plan;

  b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

  c. FERC staff reviews and the Director of the OEP approves the cultural resources reports and plans, and notifies Cheyenne Connector in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.

  All materials filed with the Commission containing <u>location, character, and ownership information</u> about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: <u>"CUI//PRIV - DO NOT RELEASE."</u>

Cheyenne Connector contacted the following Native American tribes regarding the Pipeline Project, providing a project description and mapping, and also followed-up with the tribes: Apache Tribe of Oklahoma; Cheyenne and Arapaho Tribes; Cheyenne River Sioux Tribe; Comanche Nation of Oklahoma; Crow Creek Sioux Tribe; Fort Sill Apache Tribe; Kiowa Tribe of Oklahoma; Northern Arapaho Tribe; Northern Cheyenne Tribe; Oglala Sioux Tribe; Rosebud Sioux Tribe; Southern Ute Indian Tribe; Standing Rock Sioux Tribe; Ute Indian Tribe; and Ute Mountain Ute Tribe.

In a letter dated March 15, 2018, the Kiowa Tribe indicated the Pipeline Project should have minimal potential to adversely affect any known archaeological, historical, or sacred Kiowa sites, but requested to be notified of unanticipated discoveries during construction. In a letter dated March 28, 2018, the Cheyenne and Arapaho Tribes categorized the Pipeline Project as "no significant properties," but requested to be notified of unanticipated discoveries during construction. In letters dated April 26 and May 9, 2018, the Comanche Nation indicated "no properties have been identified" after a check of their site files. On March 23, 2018 and April 16, 2018, the Northern Cheyenne

Tribe requested a copy of the Class III report, which Cheyenne Connector provided. In a letter dated April 20, 2018, the Southern Ute Indian Tribe requested to be a consulting party. No other responses have been received. We sent our NOI to these same tribes. In response to our NOI, on June 11, 2018, the Southern Ute Tribe requested to be a consulting party. On June 4, 2018, the Northern Cheyenne indicated that survey work must be done in consultation with the tribes, expressed concern over the protection of sites, and requested on-site monitoring if survey work was not done with consideration for consulting tribes. No other responses to our NOI have been received from the tribes.

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

8. 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 resulting from construction and operation of the Projects.

8.1 Existing Environment

The Projects' areas are entirely within Weld County. The Pipeline Project would extend from a point approximately 10 miles south of downtown Greeley, make a circuit around the Greeley metro area on its east side, and then proceed northerly to a point at the site of Rockies Express' existing Cheyenne Hub (and proposed Enhancement Project) near the Wyoming border.

The climate in Weld County is characterized by low relative humidity, abundant sunshine, infrequent rains and snow, moderate to high wind movement, and a large daily and seasonal range in temperature. Areas very near the Rocky Mountain range, nearer the western edge of the County, are subject to periodic and sometimes severe turbulent westerly winds over the mountain barrier, referred to as "chinook winds" when warm and "bora winds" when associated with a strong cold frontal passage (Colorado State University, 2003). In Greeley, near the southern terminus of the Pipeline Project area, temperatures range from an average high of 94.3 °F in July to an average low of 15.9 °F in January. At the northern end of the proposed pipeline including the site for the proposed Cheyenne Hub Enhancement Project, yearly temperatures fall within a somewhat narrower band, with average high temperatures around 83.4 °F in July and lows around 17.3 °F in January. Precipitation is relatively consistent throughout the Projects' area, averaging between 15 and 16 inches of rainfall equivalent per year.

Ambient air quality is protected by the Clean Air Act (CAA) of 1970, as amended in 1977 and 1990. The EPA oversees the implementation of the CAA and establishes National Ambient Air Quality Standards (NAAQS) to protect human health and

welfare.[11] NAAQS have been developed for seven "criteria air pollutants" including nitrogen dioxide (NO_2), carbon monoxide (CO), ozone, sulfur dioxide (SO_2), particulate matter less than or equal to 2.5 microns in aerodynamic diameter ($PM_{2.5}$), particulate matter less than or equal to 10 microns in aerodynamic diameter (PM_{10}), 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 (EPA, 2018b). At the state level, the State of Colorado has adopted the NAAQS by reference; Colorado has also established air quality standards for SO_2 (CDPHE, 2018). 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 that are discussed further in section B.8.3, below.

The EPA and state and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the United States. 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 an area is in attainment (criteria pollutant concentrations are below the NAAQS), nonattainment (criteria pollutant concentrations exceed the NAAQS) or maintenance (area was formerly nonattainment and is currently in attainment). Portions of Weld County within the Denver Metro/North Front Range region are designated in moderate ozone nonattainment, within the Pawnee Air Quality Control Region. A portion of the Pipeline Project area is within this nonattainment area, as further discussed in section B.8.3 below. The Cheyenne Hub Enhancement Project is outside this nonattainment area and is classified as being in attainment for all criteria pollutants (EPA, 2018c).

8.2 Greenhouse Gases

Greenhouse gases (GHGs) occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. Carbon dioxide (CO_2), methane, and nitrous oxide are GHGs that are emitted during fossil fuel combustion. GHGs are non-toxic and non-hazardous at normal ambient concentrations, and there are no applicable ambient standards or emission limits for GHGs under the CAA. GHG emissions due to human activity are the primary cause of increased atmospheric concentration of GHGs since the industrial age and are the primary contributor to climate change.

The primary GHGs that would be emitted by the Projects are CO_2, methane, and nitrous oxide. These GHGs would be emitted from the majority of equipment used for

[11] The current NAAQS are listed on EPA's website at https://www.epa.gov/criteria-air-pollutants/naaqs-table.

construction of the Projects, as well as during operation of the Cheyenne Hub Booster Compressor Station. In addition, various valves, fittings, and other components associated with the Cheyenne Hub Booster Compressor Station, Cheyenne Connector Pipeline and MLVs, M&R stations, and ancillary facilities for the Projects would be minor sources of fugitive methane leaks.

Emissions of GHGs are typically quantified and regulated in units of carbon dioxide equivalent emissions (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 (EPA, 2018d).[12]

8.3 Regulatory Requirements

The provisions of the CAA that are applicable to the Projects are discussed below. See section B.8.5 for estimated potential operational emissions for the Projects.

Prevention of Significant Deterioration and Nonattainment New Source Review

Proposed new or modified air pollutant emission sources must undergo a New Source Review (NSR) prior to construction or operation. Through the NSR permitting process, state and federal regulatory agencies review and approve project emissions increases or changes, emissions controls, and various other details to ensure air quality does not deteriorate as a result of new or modified existing emission sources. The two basic groups of NSR are major source NSR and minor source NSR. Major source NSR has two components: Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NNSR). PSD, NNSR, and minor source NSR are applicable to projects depending on the size of the proposed project, the projected emissions, and if the project is proposed in an attainment area or nonattainment/maintenance area. The CDPHE administers the PSD and NNSR permitting programs in Colorado. PSD regulations define a major source as any source type belonging to a list of 28 specifically listed source categories that have a potential to emit 100 tons per year (tpy) or more of any regulated pollutant or 250 tpy for sources not among the listed source categories (such as natural gas compressor stations). These emission rate levels are referred to as the PSD major source thresholds.

[12] These GWPs are based on a 100-year time period. We have selected their use over other published GWPs for other timeframes because these are the GWPs the EPA has established for reporting of GHG emissions and air permitting requirements. This allows for a consistent comparison with these regulatory requirements.

The Cheyenne Hub Booster Compressor Station would not exceed the PSD major source thresholds for any pollutants. Therefore, the proposed construction and operation of the Cheyenne Hub Booster Compressor Station does not trigger PSD or NNSR.

Title V Permitting

Title V, also known as "CAA Part 70," is an air quality operating permit program delegated by the EPA to each state for facilities defined by these regulations as "major sources." The major source threshold for an air emission source is 100 tpy for criteria pollutants, 10 tpy for any single HAP, and 25 tpy for total HAPs. The proposed Cheyenne Hub Booster Compressor Station has the potential to emit greater than 100 tpy of nitrogen oxides (NO_x), and also has the potential to emit greater than 10 tpy of a single HAP (formaldehyde), and therefore meets the definition of a major source that requires a Title V Operating Permit based on both of these criteria.

Prior to commencing construction, the Colorado Code of Regulations "Regulation Number 3 Stationary Source Permitting and Air Pollutant Emission Notice Requirements" (5 Code of Colorado Regulations 1001-5) requires issuance of a Construction Permit, and following construction, a Title V Operating Permit for the Cheyenne Hub Booster Compressor Station. In January 2018, Rockies Express filed its Construction Permit application with the CDPHE, and on June 18, 2018, the CDPHE issued a Construction Permit for the station.

New Source Performance Standards

The EPA promulgates New Source Performance Standards (NSPS) for new, modified, or reconstructed sources to control emissions to the level achievable by the best-demonstrated technology for stationary source types or categories as specified in the applicable provisions discussed below. The NSPS also establish fuel, monitoring, notification, reporting, and recordkeeping requirements.

As indicated in the Construction Permit issued by the CDPHE for the Cheyenne Hub Booster Compressor Station, the Enhancement Project is subject to the following NSPS requirements:

- 40 CFR 60 Subpart OOOOa – sets emission standards and compliance schedules for VOC and SO_2 emissions for new, modified, or reconstructed wet seal centrifugal compressor and reciprocating compressors; limits for bleed rates for natural-gas driven pneumatic controllers; requires work practice standards for

compressor rod packing compressor units; and sets fugitive leak monitoring and repair requirements for compressor stations.[13]

- 40 CFR 60 Subpart JJJJ – sets emissions standards for NO_x, CO, and VOC for emergency and non-emergency spark-ignition engines manufactured on or after July 1, 2007.

National Emission Standards for Hazardous Air Pollutants

The 1990 CAA Amendments established a list of 189 HAPs, resulting in the promulgation of National Emission Standards for Hazardous Air Pollutants (NESHAP). The NESHAP regulate HAP emissions from specific source types at major or area sources of HAPs by setting emission limits, monitoring, testing, record keeping, and notification requirements. The Cheyenne Hub Booster Compressor Station would have the potential to emit the HAP formaldehyde in amounts greater than the single HAP threshold of 10 tpy and is therefore considered a major source of HAPs. In addition to major sources, some of the NESHAP also apply to minor, or area, sources of HAPs.

As outlined in the Construction Permit issued by the CDPHE for the Cheyenne Hub Booster Compressor Station, the reciprocating compressor engines at the station are subject to the following NESHAP requirements:

- 40 CFR 63 Subpart ZZZZ – sets emission and operating limitations for HAPs emitted from reciprocating engines;
- 40 CFR 63, General Compliance Requirements – specify that the source at all times must be in compliance with emission limitations, operating limitations, and other requirements of Subpart ZZZZ, must be operated in a manner consistent with safety and good air pollution control practices for minimizing emissions, enforceable by the CDHPE through the review of monitoring results, operation and maintenance procedures and records, and inspections;
- Testing and Initial Compliance Requirements – specify that initial performance tests be conducted within 180 days of the compliance date set in accordance with 40 CFR Sections 63.6595 and 63.7(a)(2), subsequent performance tests be conducted semiannually, and annually following demonstrated compliance after the first two tests, using a continuous parameter monitoring system, as applicable;
- Continuous Compliance Monitoring Requirements – specify that emissions from all reciprocating engines subject to Subpart ZZZZ compliance testing

[13] On September 11, 2018, the EPA proposed amendments to Subpart OOOOa, which if implemented may affect the ways in which affected sources are subject to the rule.

requirements be monitored continuously in accordance with procedures outlined in 40 CFR 63; and

- Notifications, Reports, and Records Requirements – specify the timeframes for notification of initial start up of the engines, and recordkeeping and reporting requirements for performance testing to demonstrate compliance with Subpart ZZZZ.

Rockies Express would comply with the all applicable NSPS and NESHAP standards and requirements, as necessary and as stated in the Construction Permit issued by the CDPHE for the proposed Cheyenne Hub Booster Compressor Station.

General Conformity

According to Section 176(c)(1) of the CAA (40 CFR 51.853), a federal agency cannot approve or support an activity that does not conform to an approved State Implementation Plan. Therefore, a conformity analysis to determine whether a project would conform to an approved State Implementation Plan is required when a federal action would generate emissions exceeding conformity threshold levels of pollutants for which an air basin is designated as nonattainment or maintenance. A conformity applicability determination requires that direct and indirect emissions of nonattainment or maintenance pollutants (or precursors) resulting from the federal action be compared with general conformity applicability emissions thresholds. If the thresholds are exceeded, general conformity applies and a conformity determination is required.

The lead federal agency 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.

For the portion of the Pipeline Project within the Denver Metro Region/North Front Range ozone nonattainment area, pollutants for which general conformity could potentially apply are NO_x and VOC, which would be generated by construction equipment. The applicable general conformity threshold for each of these pollutants is 100 tpy. As shown in table 22, emissions of NO_x and VOC from construction of the entire Pipeline Project fall under the 100 tpy threshold. We also note that no other pollutant emissions from Pipeline Project construction summarized in table 22 exceeds any applicable threshold for which general conformity could potentially apply. As stated above, the Enhancement Project site is within an area of Weld County classified as being in attainment for all criteria pollutants (EPA, 2017c). Therefore, neither of the Projects is subject to a general conformity determination.

Mandatory Greenhouse Gas Reporting Rule

The EPA's Mandatory Reporting of Greenhouse Gases Rule requires reporting from applicable sources of GHG emissions if they emit greater than or equal to 25,000

metric tons of GHG (as CO_2e) in 1 year.[14] The Mandatory Reporting of Greenhouse Gases Rule does not require emission control devices and is strictly a reporting requirement for stationary sources based on actual emissions. Although the rule does not apply to construction emissions, we have provided GHG construction emission estimates for the Projects, as CO_2e, for accounting and disclosure purposes in section B.8.4, tables 21 and 22. Potential operational GHG emission estimates as CO_2e for the Enhancement Project, and modified Cheyenne Hub, are presented in section B.8.5, table 23. Based on the potential emission estimates presented, actual CO_2e emissions from the Cheyenne Hub Booster Compressor Station would likely exceed 25,000 metric tpy, and Rockies Express would be required to report actual CO_2e emissions from the station in accordance with the rule.

Methane Challenge Program

In August 2016, the EPA officially approved the "Our Nation's Energy Future" (ONE Future) Commitment Option under the Natural Gas STAR Methane Challenge Program. Natural gas pipeline companies may opt to participate in the Methane Challenge Program through the ONE Future Option. As part of this program, companies implement techniques and practices included in the company's Methane Challenge Implementation Plan to reduce transmission pipeline blowdown (methane) emissions to the extent feasible while maintaining pipeline safety and integrity and minimizing adverse customer impacts. Neither of the Applicants for the proposed Projects participates in the Natural Gas STAR Methane Challenge Program, thus recommended measures from these programs would not be implemented at the facilities associated with either Project.

State Air Quality Regulations

In addition to federal standards, the CDPHE Code of Colorado Regulations establishes additional standards for particulate matter, smoke, CO, sulfur oxides, odors, stationary source permitting, control of ozone precursors and control of hydrocarbons via oil and gas emissions, asbestos controls, and state standards for hazardous pollutants.

In accordance with the Construction Permit issued by the CDPHE, the Enhancement Project would be subject to several requirements including provisions for compressor blowdown event limitations on a monthly and annual basis, fuel consumption measurement, visible emission opacity limits, operation and maintenance procedures, periodic compliance testing and sampling, exhaust stack minimum height above ground level specifications for exhaust stacks, fully-enclosed fence lines, and building layout design.

The CDPHE issued a Colorado General Construction Permit – Land Development Projects, Permit No. GP03 to Cheyenne Connector for its Pipeline Project; Rockies

[14] A metric ton is approximately equal to 1.1 tons.

Express would also be required to obtain a separate CDPHE-issued Permit No. GP03 for its Enhancement Project.

8.4 Construction Emissions Impacts and Mitigation

Construction of the Projects would result in temporary, localized emissions that would last the duration of construction activities (estimated at 7 months). Exhaust emissions would be generated by the use of heavy equipment and trucks powered by diesel or gasoline engines. Exhaust emissions would also be generated by delivery vehicles and construction workers commuting to and from work areas.

Construction activities would also result in the temporary generation of fugitive dust 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. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity.

Construction emission estimates are 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 AP-42 data (EPA, 2018e), EPA MOVES nonroad 2018 for Weld County, Colorado, the Western Regional Air Partnership Fugitive Dust Handbook, manufacturer's emissions data, EPA Protocol for Equipment Leak Emission Estimates (EPA, 2018f), historical equipment usage (blowdown events only), and GWP factors found in 40 CFR 98 (EPA, 2018d).

Tables 21 and 22 below provide the construction emissions from each Project, including exhaust emissions and fugitive dust from on-road and off-road construction equipment and vehicles, exhaust emissions from construction worker vehicles for commuting, and vehicles used to deliver equipment/materials to the site.

Table 21
Emissions from Enhancement Project Construction

Source	Construction Emissions (tpy) a/							
	CO	NO_X	SO_2	VOC	PM_{10}	$PM_{2.5}$	HAPs	CO_2e
Construction Equipment Engines	4.8	3.9	0.005	0.8	0.3	0.3	0.2	897
On-Road Vehicle including Commuter Transit	0.6	0.2	0.001	0.02	0.006	0.005	0.003	116
Fugitive Dust	-	-	-	-	17.8	1.5	-	-
Project Total	**5.4**	**4.1**	**0.006**	**0.8**	**18.1**	**1.8**	**0.2**	**1,013**

a/ Figures are rounded; addends in each column may not sum to total.

Table 22 Emissions from Pipeline Project Construction								
	Construction Emissions (tpy) *a/*							
Source	**CO**	**NO_x**	**SO_2**	**VOC**	**PM_{10}**	**$PM_{2.5}$**	**HAPs**	**CO_2e**
Construction Equipment Engines	51.2	23.4	0.032	4.6	1.6	1.6	1.1	5,992
On-Road Vehicle Travel	3.6	2.0	0.0077	0.2	0.1	0.1	0.1	967
Fugitive Dust	-	-	-	-	77.5	7.8	-	-
Project Total	**54.8**	**25.4**	**0.040**	**4.8**	**79**	**9.5**	**1.2**	**6,959**
a/ Figures are rounded; addends in each column may not sum to total.								

Construction emissions shown in tables 21 and 22 are not expected to result in a violation or degradation of ambient air quality standards.

In order to mitigate and minimize fugitive dust and other visible particulate emissions during construction of the Projects, the Applicants would employ the following measures within their respective General Construction Permits (GP03 – Land Development Projects) issued by the CDPHE:

- limit the opacity of visible emissions generated within all construction ("on-site") areas to no more than 20 percent;
- prohibit off-site transport of visible emissions from on-site haul roads and comply with other guidelines for off-site haul roads;
- water all unpaved roads and other on-site disturbed surface areas as necessary to prevent off-site transport of visible particulate emissions;
- limit vehicle speeds on all on-site unpaved roads and disturbed surface areas to no more than 30 miles per hour, posting speed limit signs as appropriate;
- halt all earth-disturbing work during times when wind speed exceeds 30 miles per hour;
- utilize graveled entryways to minimize mud and dirt track out onto paved surfaces; and
- clean paved surfaces of mud and dirt track out on a daily basis.

The above measures and requirements that the Applicants would employ during the Projects' construction and operation would ensure that impacts of fugitive dust would be minimized. In general, due to the distance between the Projects' construction sites and the nearest residences, we conclude that impacts of fugitive particulate emissions on residences, combined with the above mitigation, would not be significant.

Construction emissions would occur over the duration of construction activity and would be emitted at different times throughout the Projects' areas. Construction emissions would be relatively minor and would result in short-term, localized impacts in

the immediate vicinity of construction work areas. With the mitigation measures proposed by the Applicants, we conclude air quality impacts from construction would be temporary and would not result in a significant impact on local or regional air quality.

8.5 Operational Emissions Impacts and Mitigation

The Projects would generate air emissions mainly during operation of the Cheyenne Hub Booster Compressor Station associated with the Cheyenne Hub Enhancement Project's proposed new equipment and processes at the existing Cheyenne Hub, including:

- six natural gas-fired compressor engines each rated at 5,350 horsepower;
- one 2.0-million British Thermal Unit (BTU) per hour natural gas-fired fuel gas heater;
- eight 0.6-million BTU per hour natural gas-fired space heaters;
- two 0.2-million BTU per hour natural gas-fired space heaters;
- blowdown releases; and
- fugitive emission releases from storage tanks; miscellaneous valves, connections, and other components; and pneumatic controllers.

Operation of the Pipeline Project including the Lancaster, Latham, Mewbourn, O'Connor, and Connector M&R Stations would also emit fugitive releases of methane from valves, fittings, and other components.

Table 23 provides estimates of the potential annual emissions at the modified Cheyenne Hub, including the Cheyenne Hub Booster Compressor Station and other ancillary facilities associated with the Enhancement Project. These estimated emissions are based on AP-42 data (EPA, 2018e), manufacturer's emissions data, EPA TANKS 4.0.9d emission factors, EPA Protocol for Equipment Leak Emission Estimates, historical equipment usage (blowdown events only), GWP factors found in 40 CFR 98 (EPA, 2018d), and assumptions that the station operates at full capacity year-round (i.e., 8,760 hours per year). The Cheyenne Hub Booster Compressor Station would not likely operate at full load every day; therefore, table 20 provides conservative, "worst-case" estimates of emissions.

Compressor unit blowdowns (gas venting) can occur during initial construction/ testing, operational startup and shutdown, maintenance activities, and during emergency purposes. Emission estimates of methane releases from compressor unit blowdowns and piping components are also included in table 23. During normal operations, blowdowns resulting from compressor startup/shutdown and during maintenance activities would be infrequent.

Table 23 Potential Operational Emissions from the modified Cheyenne Hub (tpy) a/			
Pollutant	**Existing Cheyenne Hub**	**Proposed Enhancement Project**	**Total for modified Cheyenne Hub**
PM_{10}	0.16	10.32	10.48
$PM_{2.5}$	0.16	10.32	10.48
SO_2	0.13	0.63	0.76
CO	0.29	63.02	63.31
NO_X	0.88	154.73	155.61
VOC	2.9	46.55	49.41
HAP	0.00	19.33	19.33
CO_2e	1,434	133,786	135,220
a/ Includes emissions from operation of the Cheyenne Hub Booster Compressor Station as well as existing sources at the Cheyenne Hub (compressor and warehouse building heaters). The existing Cheyenne Hub is also currently equipped with two existing electric motor-driven compressors each rated at 17,500 horsepower.			

Fugitive release emissions from the operation of the Cheyenne Connector Pipeline and the Lancaster, Latham, Mewbourn, O'Connor, and Connector M&R Stations are summarized in table 24.

Table 24 Potential Operational Emissions from the Pipeline Project	
Pollutant	**Total Emissions (tpy)**
VOC	0.98
CO_2e	678

To minimize fugitive emissions from operation of the Projects, the Applicants would comply with the standards in 40 CFR 60 Subpart OOOOa, which specify leak detection and repair programs as applicable.[15]

Downstream Emissions

Although the natural gas delivered by the Projects would be directed to other pipeline systems or delivered to a local distribution system, the ultimate end use is not known. The gas could be used to replace existing gas sources, replace higher carbon sources such as oil and coal; or be used as an industrial feedstock. The Commission's policy is that any estimate of downstream GHG emissions, unless used for a known end-use, provides no additional information to inform the NEPA analysis or its determination of Public Convenience and Necessity for a proposed project.

[15] As noted above, the EPA proposed amendments to Subpart OOOOa, which if implemented may affect the ways in which affected sources are subject to the rule.

Air Quality Modeling

Rockies Express completed an air quality dispersion model to determine the impacts of emissions from the Cheyenne Hub Booster Compressor Station on regional air quality. The analysis was conducted using the EPA AERMOD model version 16216R, AERMAP version 11103, and in accordance with the *Colorado Modeling Guideline for Air Quality Permits* (2011) and the EPA's *Guidelines on Air Quality Models – 40 CFR 51 Appendix W* (2017). Rockies Express' analysis assumed that the station would be running at full capacity (i.e., 8,760 hours per year at maximum emission rates). The model estimates the maximum predicted concentrations of criteria pollutants emitted from the compressor station using conservative assumptions. The model also incorporated other permitted point sources within a 50-kilometer radius of the station to account for the potential for cumulative regional impacts of the proposed modified Cheyenne Hub and these other sources. Ambient background concentrations from the nearest air monitors were then added to the maximum predicted concentrations from the model and the total was compared to the NAAQS. The model results are provided in table 25 below.

The results in table 25 indicate that the combined total of existing background and maximum modeled concentrations are less than the applicable NAAQS for all pollutants. Therefore, the operation of Rockies Express' modified Cheyenne Hub, including the Enhancement Project facilities, would not cause or significantly contribute to a degradation of ambient air quality. The Enhancement Project would comply with the NAAQS, which are established to be protective of human health, including sensitive populations such as children, the elderly, and asthmatics.

Table 25
Predicted Air Quality Impacts (µg/m^3)

Pollutant	Averaging Period	Existing Ambient Background Concentration a/	Maximum Modeled Concentration (includes background)	NAAQS
NO_2	1-hour	33.9	158.6	188
	Annual	3.77	29.3	100
$PM_{2.5}$	24-Hour	22	30.1	35
	Annual	7	8.0	12

µg/m^3 = micrograms per cubic meter
a/ Background concentration estimates based on data obtained from air monitoring stations at the RM Steel Reservoir Site, 2014-2015 (NO_2) and the Xcel Fort St. Vrain Plant, 2009 – 2010 ($PM_{2.5}$).

Class I Areas

Under the PSD program, 156 mandatory federal Class I areas are currently designated by the EPA to protect certain areas (e.g., wilderness areas, national parks, national forests) to ensure that deterioration of existing air quality-related values, such as

visibility, is minimized in these areas. Relative to Class II and III areas, Class I areas have the most restrictive allowable PSD air quality increments. For a new major source or major modification located within 62 miles (100 kilometers) of Class I area, the facility is required to notify the appropriate federal land manager and assess the impacts of that project on the nearby Class I area.

In 2010, the U.S. Forest Service, National Park Service, and USFWS collaborated on the publication of the Federal Land Managers' Air Quality Related Values Work Group (FLAG) Report, which offers guidance on the protection of Air Quality Related Values and addresses assessments for sources proposed near Class I airsheds (U.S. Forest Service et al., 2010). Although the primary focus of FLAG is the NSR program, particularly PSD, the guidance is also useful for making general assessments of impact for non-PSD sources. The nearest federal Class I Areas, the Rawah Wilderness, Rocky Mountain National Park, and Mount Zirkel Wilderness, are approximately 103, 105, and 159 kilometers away from the proposed Cheyenne Hub Booster Compressor Station site, respectively. Since distances from each of these Class I areas to the proposed Enhancement Project are greater than 62 kilometers, and the Cheyenne Hub Booster Compressor Station would not be a PSD source, we conclude that the Cheyenne Hub Booster Compressor Station would have negligible impacts on these Class I areas.

9. Noise

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Construction and operation of the Projects would affect overall noise levels in the Projects' areas. 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 vegetation 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 sound levels during late evening and early morning hours (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; 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise (Bies and Hansen, 1988).

9.1 Federal and State Noise Regulations

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (EPA,

1974). This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA 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 proposed Project at 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 or modified compressor station or M&R station during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. FERC also applies this noise limitation criterion more generally to construction operations having the potential to take place on 24-hour-per-day basis (e.g., HDDs). Due to the 10 dBA nighttime penalty added prior to the logarithmic calculation of the L_{dn}, 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.

Sections 801 and 802 of the Colorado Oil and Gas Conservation Commission regulations address allowable sound levels for oil and gas facilities. Natural gas facilities subject to these rules (e.g., oil and gas well drilling, natural gas processing facilities, etc.) typically are not under FERC jurisdiction. According to the Applicants' noise consultant Hoover and Keith, Inc., the "light industrial standard" may apply to noise from the proposed M&R stations. Pursuant to this standard, noise from each M&R station should not exceed 70 dBA during the daytime and 65 dBA during the nighttime at points 350 feet away from each station's site center. In addition, according to Hoover and Keith, Inc., these regulations may also require the proposed M&R stations to meet a sound level of 55 dBA during the daytime and 50 dBA during the nighttime at points 350 feet from each station's site center for adjacent properties zoned as "residential, agricultural and rural" or if noise complaints are received by a nearby property owner or local governmental designee. Hoover and Keith's analysis summarized in section B.9.4 below concludes that the proposed M&R stations would comply with these state-level requirements, if applicable.

Weld County does not have noise regulations applicable to construction or operation of either of the Projects.

9.2 Construction Noise Impacts and Mitigation

Noise would be generated during construction of the Projects. With the exception of noise from HDDs (discussed below), typical 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, local, and primarily limited to a 10-hour timeframe during daylight hours.

<u>HDD Noise</u>

Cheyenne Connector would conduct HDD activities at 18 locations along the pipeline route (see table 1 in section A.5.2). HDD construction often extends into the

evening hours, may be conducted on a 24-hour-per-day basis, and persist up to a period of weeks until drilling is complete. HDD noise typically has the potential to impact nearby NSAs out to a distance of 0.5 mile. Although many of the HDDs would not result in potential noise impacts at nearby NSAs exceeding the 55 dBA L_{dn} noise criterion (see appendix H for a list of HDDs and estimated unmitigated noise level contributions at nearby NSAs), some would be clearly noticeable; however, no further mitigation is necessary at these HDD entry and exit locations to limit noise impact contributions at NSAs to less than the L_{dn} criterion of 55 dBA. The HDD entry and exit locations estimated to result in a noise contribution at nearby NSAs exceeding an L_{dn} of 55 dBA without mitigation, and the estimated noise contribution after mitigation, are summarized in table 26.

Table 26
HDD Operations Having Estimated Unmitigated Noise Exceeding an L_{dn} of 55 dBA at nearby NSAs

NSA	Location	NSA Distance and Direction from HDD	Ambient L_{dn} Noise Level (dBA)	Estimated L_{dn} Noise Contribution from HDD (unmitigated, dBA)	Estimated L_{dn} Noise Contribution from HDD (mitigated, dBA)	Total L_{dn} Noise Level at NSA (dBA)	Increase above Ambient L_{dn} Noise Level (dBA)
HDD Entry							
6	WCR 49	950 feet ESE	46.4	59.6	51.6	52.7	6.3
7	WCR 46 and Neres Canal	800 feet SW	47.8	61.3	53.2	54.3	6.5
9	Weld Road and Union Pacific Railroad	600 feet SW	50.6	62.2	53.0	55.0	4.4
11	South Platte River	700 feet W	46.4	62.7	53.4	54.2	7.8
12	CSH 263 and Ogilvy Ditch	900 feet N	46.4	60.1	50.9	51.9	6.8
13	Lone Tree Creek and Pipeline	250 feet NW	45.9	73.9	54.3	54.9	9.0
15	Farm Pond and WCR 76	900 feet NE	42.6	60.1	52.1	52.5	9.9
18	Eaton Ditch - 3	700 feet NW	44.5	62.7	52.6	53.2	8.7
HDD Exit							
12	CSH 263 and Ogilvy Ditch	350 feet SSW	46.4	57.7	49.9	51.5	5.1
14	Greeley Number 2 Canal	300 feet W	43.3	59.1	51.1	51.8	8.5
18	Eaton Ditch - 3	150 feet E	44.5	66.8	53.4	53.9	9.4

With mitigation, noise from HDD operations, although noticeable at all NSAs listed in table 26, are estimated to be mitigated to below the L_{dn} noise criterion of 55 dBA. Mitigation that Cheyenne Connector would implement to reduce noise to the levels in table 26 would require one or more of the following:

- employing a temporary 20 to 24-foot-high noise barrier around the entry site workspace constructed of 0.75-inch-thick plywood panels with sound-absorbing interior surfaces or other sound-absorptive material that achieves a minimum sound transmission class 30–40 rating (e.g., barrier system designed with a septum mass layer or acoustical panel system);
- employing residential-grade exhaust silencers on any of the site HDD equipment engines (e.g., generators, high-pressure mud pump, and/or hydraulic power unit);

- installing a "close-fit" noise barrier around the hydraulic power unit and engine-driven pumps by covering the sides of the equipment with a sound-absorptive material that achieves a minimum sound transmission class 30–40 rating. As an option, place hydraulic power unit equipment and high-pressure mud pump in an acoustical enclosure;
- employing a partial noise barrier around any engine jacket-water coolers;
- installing a partial barrier or partial enclosure around the mud mixing/cleaning system (e.g., sound-absorptive material that achieves a minimum sound transmission class 30–40 rating and designed for a sound transmission loss of 15 to 20 dB between 31.5 and 63 Hertz octave band sound pressure levels);
- relocating specific equipment (e.g., mud cleaning system and high-pressure mud pump);
- employing low-noise generators, which are designed with a factory-installed enclosure;
- as an alternative to noise mitigation, discussing/offering temporary housing or equivalent monetary compensation to the affected landowners;
- employing a temporary noise barrier at the workspace (20 to 24 ft. height barrier, between site equipment and the closest NSAs) at each HDD exit site.

To ensure that noise attributable to HDDs would not be significant at nearby NSAs, **we recommend that**:

- **<u>Prior to construction of HDD numbers 6, 7, 9, 11, 12, 13, 15, and 18 entry sites and HDD numbers 12, 14, and 18 exit sites</u>, Cheyenne Connector should file with the Secretary, for the review and written approval by the Director of OEP, a site-specific HDD noise mitigation plan for each listed HDD entry and exit site to reduce the projected noise level attributable to the proposed drilling operations. During drilling operations, Cheyenne Connector should implement the approved plan, monitor noise levels, include the noise levels in the biweekly construction status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA at the NSAs.**

As part of modifications to its Pipeline Project filed August 2, 2018, Cheyenne Connector shifted the entry and exit point locations of HDDs #1, 4 (now identified by Cheyenne Connector as HDD #4R), 8, and 14. In addition, Cheyenne Connector added one new HDD #13A at approximate milepost 34.5. Cheyenne Connector has not provided revised acoustic analyses for the new HDD, nor for the modified HDDs 1, 4, 8, and 14. Therefore, to ensure that noise impacts at nearby NSAs from these HDDs are not significant, **we recommend that**:

- **<u>Prior to construction of HDD #13A and modified HDDs #1, 4R, 8, and 14</u>, Cheyenne Connector should file with the Secretary an HDD noise analysis identifying the existing and projected noise levels at each NSA within 0.5 mile**

of each HDD entry and exit site. If noise attributable to the HDD is projected to exceed an L_{dn} of 55 dBA at any NSA, Cheyenne Connector should file with the noise analysis a mitigation plan to reduce the projected noise levels to below an L_{dn} of 55 dBA at any NSA, for the review and written approval by the Director of OEP. During drilling operations, Cheyenne Connector should implement the approved plan, monitor noise levels, include the noise levels in the biweekly construction status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA at the NSAs.

9.3 Operation Noise Impacts and Mitigation

The Cheyenne Hub Booster Compressor Station would generate noise when operating, and its operation would typically occur on a continuous (24 hours per day) basis. The noise impact associated with the compressor station would attenuate with distance. Noise generated at the compressor station would be from the following operational noise sources:

- engine exhaust silencer system and associated exhaust stack;
- engine air intake filter system with an in-duct intake silencer;
- outdoor jacket-water/auxiliary-water cooler serving each compressor;
- gas aftercooler that serves each compressor unit;
- aboveground piping and piping components (e.g., valves and inlet filter/scrubbers); and
- station blowdown events.

The Cheyenne Hub Booster Compressor Station would be constructed adjacent to the existing Cheyenne Hub, approximately 1,800 feet south of Kinder Morgan, Inc.'s existing Cheyenne Compressor Station. The Existing Cheyenne Hub and Cheyenne Compressor Station are surrounded by sparsely populated range land and agricultural land. On November 8, 2017, Rockies Express completed an ambient sound survey to measure the existing sound levels during the daytime and nighttime at the nearest NSA to the Cheyenne Hub site, consisting of two residences on the property of the Kinder Morgan, Inc. Cheyenne Compressor Station.[16] The results of the ambient sound survey are provided in table 27.

The results of the ambient sound survey were combined with the predicted noise impacts from the proposed compressor station equipment to estimate the noise impacts from operation of the compressor station at the NSA. The predictive noise analysis incorporates noise control measures for operational noise. Noise control measures at the Cheyenne Hub Booster Compressor Station assumed in this analysis include acoustic

[16] Cheyenne Connector states that only a few residences are within 1 mile of the Cheyenne Hub site; Hoover and Keith performed an ambient noise survey and acoustic analysis for the nearest NSA only. We agree that any analysis including more distant NSAs would not further inform our assessment of impact.

specifications and other design requirements for the compressor station building walls, entry doors, air ventilation system, engine exhaust system/silencer, engine air intake system, air intake silencer, jacket-water/auxiliary-water cooler, gas aftercooler, and blowdown silencer for each compressor. Rockies Express commits to employing all of these recommended noise mitigation measures, specified in detail within section 8.0 of Hoover & Keith Inc. Report No. 3651. The recommended noise control measures would also serve to minimize vibration. The results of the operational noise analysis are included in table 27.

The operational noise analysis summarized in table 27 indicates that the compressor station's noise contribution at the residences identified as "NSA #1" would likely not be perceptible.

Table 27
Noise Analysis for the proposed Cheyenne Hub Booster Compressor Station

NSA	Distance and Direction from Station Site Center	Distance and Direction from Station Compressor Units	Ambient Background L_{dn} Noise Level during operation of existing Cheyenne Hub (dBA)	Predicted L_{dn} Noise Level Contribution from Station (dBA)	Predicted Total L_{dn} Noise Level (dBA)	Predicted Change in L_{dn} from Existing Ambient (dBA)
NSA #1 (residences)	3,650 feet NNW	3,300 feet NNW	46.8	44.7	48.9	2.1

Blowdown events generate noise at compressor stations and occur when pressure in the compressor casing, piping, or the entire station must be released in a controlled manner. Blowdown events cause a temporary increase in sound levels that would typically last for about 1 to 5 minutes. Rockies Express would install blowdown silencers specified to meet a sound level of 70 dBA at 300 feet. This mitigated blowdown sound level is predicted to result in a noise level of approximately 43 dBA at NSA #1.

While the analysis summarized in table 27 above shows that noise impacts at NSA #1 from the compressor station would be well below our 55 dBA L_{dn} requirement, and the Project-related operational noise increase (with the exception of blowdown events) would not be perceptible. To ensure compliance with the FERC's noise standards, **we recommend that**:

- **Rockies Express should file with the Secretary a noise survey for the Cheyenne Hub Booster Compressor Station <u>no later than 60 days</u> after placing all of the equipment at the modified Cheyenne Hub into service. If a full power load condition noise survey is not possible, Rockies Express should file an interim survey at the maximum possible power load <u>within 60 days</u> of placing the station into service and file the full power load survey <u>within 6</u>**

<u>months</u>. If the noise attributable to operation of all equipment at the modified Cheyenne Hub under interim or full power load conditions exceeds an L_{dn} of 55 dBA at NSA #1, Rockies Express should:

a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;

b. install additional noise controls to meet that level <u>within 1 year</u> of the in-service date; and

c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP <u>no later than 60 days</u> after it installs the additional noise controls.

Regarding operation of the Enhancement Project aboveground facilities, the proposed O'Connor, Mewbourn, and Latham M&R Station sites have NSAs within 0.5 mile, and noise from operation of each of these stations has the potential to impact nearby NSAs. No NSAs are within 0.5 mile of the Lancaster and Cheyenne Connector M&R Stations; therefore, a noise analysis was not performed. We note that the Latham and Mewbourn M&R Stations are in very close proximity; therefore, these two stations are evaluated together.

Cheyenne Connector conducted an ambient sound survey on January 25, 2018, to measure the existing sound levels during the daytime and nighttime at the nearest NSAs to the respective O'Connor and Mewbourn/Latham M&R Station sites. The results of the operational noise from the stations combined with the ambient sound levels are provided in table 28.

The estimates in table 28 assume that the flow control valve in each M&R station is designed to achieve a maximum 90 dBA at 3 feet from the gas piping downstream of each valve for the full range of operating conditions, which may require covering aboveground gas piping and associated piping components with acoustical insulation and/or enclosing the regulator skid/piping with an "off-skid" building. We also note that subsequent to the original noise analysis performed for the O'Connor M&R station, Cheyenne Connector modified the location of the M&R station, now proposed on the east side of the existing DCP Midstream gas processing plant. At Cheyenne Connector's originally proposed location for the O'Connor M&R Station, the nearest NSA was approximately 2,700 feet SE. According to Cheyenne Connector, the nearest NSA is now approximately 1,900 feet from the proposed new location of the station. We used the noise impacts predicted in the noise analysis performed for the original location of the M&R station to estimate noise impacts from the station at the proposed new location at the nearest NSA, accounting only for the change in distance from the nearest NSA.

The operational noise analyses indicate that the proposed M&R stations' respective estimated noise contributions at nearby NSAs would likely not be perceptible at the nearest NSAs.

Table 28
Noise Analysis for the Proposed O'Connor and Combined Mewbourn and Latham M&R Stations

Project M&R Stations	Nearest NSA	NSA Distance and Direction	Predicted Noise Contribution of M&R Station at NSA (dBA L_{dn})	Ambient Level (dBA L_{dn})	Predicted Combined M&R Station Noise and Ambient (dBA L_{dn})	Predicted Increase Above Ambient (dBA)
O'Connor M&R Station	Residence	1,900 ft. (SE)	38.8	52.6	52.8	0.2
Mewbourn and Latham M&R Stations	Residence	2,100 ft. (NE)	42.9	59.1	59.2	0.1

Based on the estimates summarized in table 28 above, we conclude that the noise increase over existing ambient levels attributable to the O'Connor and Mewbourn/Latham M&R stations at full-load operation would likely not be audible at nearby NSAs, and the noise contributions from these stations at nearby NSAs would also remain well below the FERC's L_{dn} noise criterion of 55 dBA.

While existing noise levels would be impacted by operation of the Cheyenne Hub Booster Compressor Station and Cheyenne Connector, Lancaster, Latham, Mewbourn, and O'Connor M&R Stations, based on our analyses that incorporate proposed noise mitigation measures, and our recommendations stated above, we conclude that the Projects would not result in significant noise impacts on any nearby NSAs.

10. Reliability and Safety

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural 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 auto-ignition temperature of 1,000 °F and is flammable at concentrations between 5.0 percent and 15.0 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite and burn if there is an ignition source. 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.

Safety Standards

The DOT is mandated to prescribe minimum safety standards to protect against risks posed by pipeline facilities under Title 49, U.S.C. Chapter 601. The DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. PHMSA's safety mission is to ensure that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local levels.

Section 5(a) of the Natural Gas Pipeline Safety Act (promulgated in Title 49, U.S. Code Chapter 601) provides for a state agency to assume all aspects of the safety program for intrastate facilities by adoption and enforcing the federal standards, while Section 5(b) permits a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement actions. The State of Colorado is authorized by PHMSA under Section 5(a) to assume all aspects of the safety program's intrastate, but not interstate, facilities to ensure compliance with all federal and state safety rules and regulations related to design, construction, operation, and maintenance (Colorado Public Utilities Commission, 2018; PHMSA, 2018a). The State of Colorado does not have delegated authority to inspect interstate pipeline facilities.

The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 specifically addresses natural gas pipeline safety issues. Under a Memorandum of Understanding on Natural Gas Transportation Facilities dated January 15, 1993, between the DOT and the FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection. Alternatively, an applicant must certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the

Memorandum to promptly alert the DOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the Projects 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 specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

Further, 49 CFR 192.163 – 192.173 specifically addresses design criteria for compressor stations, 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 an emergency.

The DOT also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined below:

- Class 1: Location with 10 or fewer buildings intended for human occupancy;
- Class 2: Location with more than 10 but less than 46 buildings intended for human occupancy;
- Class 3: Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period; and
- Class 4: Location where buildings with four or more stories aboveground are prevalent.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. For instance, pipelines constructed on land in Class 1 locations must be installed with a minimum depth of cover of 30 inches in normal soil and 18 inches in consolidated rock. Class 2, 3, and 4 locations, as well as drainage ditches of public roads and railroad crossings, require a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing block valve (*e.g.*, 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness and pipeline design pressures; hydrostatic test pressures; maximum allowable operating pressure; inspection and testing of welds; and frequency of pipeline patrols and leak surveys must also conform to higher standards in more populated areas. Preliminary class locations for the Pipeline Project have been developed based on the relationship of the pipeline centerline to other nearby structures and manmade features. The Pipeline Project would consist of approximately 56.1 miles of Class 1, 14.2 miles of Class 2, and 0.3 mile of Class 3 pipe.[17]

If a subsequent increase in population density adjacent to the right-of-way results in a change in class location for the pipeline, Cheyenne Connector would reduce the maximum allowable operating pressure or replace the segment with pipe of sufficient grade and wall thickness, if required to comply with the DOT requirements for the new class location.

The DOT Pipeline Safety Regulations require operators to develop and follow a written integrity management program that contain all the elements described in 49 CFR 192.911 and address the risks on each transmission pipeline segment. The rule establishes an integrity management program which applies to all high consequence areas (HCA).

The DOT has published rules that define HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate for DOT to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

The HCAs may be defined in one of two ways. In the first method an HCA includes:

[17] Cheyenne Connector increased the total length of its proposed Cheyenne Connector Pipeline route by approximately 0.4 mile to accommodate modifications made subsequent to its initial Pipeline Project application filing; this 0.4 mile would be added in some combination to the Class 1, Class 2, and/or Class 3 totals presented here.

- current class 3 and 4 locations;
- any area in Class 1 or 2 where the potential impact radius[18] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle;[19] or
- any area in Class 1 or 2 where the potential impact circle includes an identified site.

An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

In the second method, an HCA includes any area within a potential impact circle which contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Once a pipeline operator has determined the HCAs along its pipeline, it must apply the elements of its integrity management program to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the integrity management plan at section 192.911. The HCAs have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. Of the 70.6 miles of proposed pipeline route, Cheyenne Connector has identified approximately 0.3 mile that would be classified as an HCA. The pipeline integrity management rule for HCAs requires inspection of the pipeline HCAs every 7 years.

The DOT prescribes the minimum standards for operating and maintaining pipeline and compressor station facilities, including the requirement to establish a written plan governing these activities. Each pipeline operator is required to establish an emergency plan that includes procedures to minimize the hazards of a natural gas pipeline emergency. Key elements of the plan include procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials, and coordinating emergency response;
- emergency system shutdown and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and

[18] The potential impact radius is calculated as the product of 0.69 and the square root of: the maximum allowable operating pressure of the pipeline in psig multiplied by the square of the pipeline diameter in inches.
[19] The potential impact circle is a circle of radius equal to the potential impact radius.

- protecting people first and then property, and making them safe from actual or potential hazards.

The DOT requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to learn the resources and responsibilities of each organization that may respond to a natural gas pipeline emergency, and to coordinate mutual assistance. 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. The Applicants would provide the appropriate training to local emergency service personnel before the Projects are placed in service.

Pipeline Accident Data

The DOT requires all operators of natural gas transmission pipelines to notify the DOT of any significant incident and to submit a report within 30 days. Significant incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization; or
- involve property damage of more than $50,000 (1984 dollars).[20]

During the 20-year period from 1996 through 2015, a total of 1,310 significant incidents were reported on the more than 300,000 total miles of natural gas transmission pipelines nationwide (PHMSA, 2018b).

Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 29 provides a distribution of the causal factors as well as the number of each incident by cause.

The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure constituting 50.7 percent of all significant incidents. The pipelines included in the data set in table 29 vary widely in terms of age, diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

The frequency of significant incidents is strongly dependent on pipeline age. Older pipelines have a higher frequency of corrosion incidents and material failure, because corrosion and pipeline stress/strain is a time-dependent process.

[20] $50,000 in 1984 dollars is approximately $114,993 as of May 2015 (Bureau of Labor Statistics, 2015).

Table 29
Natural Gas Transmission Pipeline Significant Incidents by Cause (1996-2015) a/

Cause	Number of Incidents	Percentage
Pipeline material, weld, or equipment failure	354	27.0
Corrosion	311	23.7
Excavation	210	16.0
All other causes b/	165	12.6
Natural forces c/	146	11.1
Outside force d/	84	6.4
Incorrect operation	40	3.1
Total	**1,310**	**100**

a/ Source: PHMSA, 2018b.
b/ All other causes include miscellaneous, unspecified, or unknown causes.
c/ Natural force damage includes earth movement, heavy rain, floods, landslides, mudslides, lightning, temperature, high winds, and other natural force damage.
d/ Outside force damage includes previous mechanical damage, electrical arcing, static electricity, fire/explosion, fishing/maritime activity, intentional damage, and vehicle damage (not associated with excavation).

The use of both an external protective coating and a cathodic protection system,[21] required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

Outside force, excavation, and natural forces are the cause in 33.5 percent of significant pipeline incidents. These result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 30 provides a breakdown of external force incidents by cause.

Older pipelines have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller-diameter pipelines; which have a greater rate of outside forces incidents. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movement.

Since 1982, operators have been required to participate in “One Call” public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The “One Call” program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts.

[21] Cathodic protection is a technique to reduce corrosion (rust) of the natural gas pipeline through the use of an induced current or a sacrificial anode (like zinc) that corrodes at faster rate to reduce corrosion.

Table 30 Excavation, Natural Forces, and Outside Force Incidents by Cause (1996-2015) a/		
Cause	**Number of Excavation, Natural Forces, and Outside Force Incidents**	**Percentage of All Incidents b/, c/**
Third party excavation damage	172	13.1
Heavy rain, floods, mudslides, landslides	74	5.7
Vehicle (not engaged with excavation)	49	3.7
Earth movement, earthquakes, subsidence	32	2.4
Lightning, temperature, high winds	27	2.1
Operator/contractor excavation damage	25	1.9
Unspecified excavation damage/previous damage	13	1.0
Other or unspecified natural forces	13	1.0
Fire/explosion	9	0.7
Fishing or maritime activity	9	0.7
Other outside force	9	0.7
Previous mechanical damage	6	0.5
Electrical arcing from other equipment/facility	1	0.1
Intentional damage	1	0.1
Total	**440**	**33.5**

a/ Source: PHMSA, 2018b.
b/ Percentage of all incidents was calculated as a percentage of the total number of incidents natural gas transmission pipeline significant incidents (i.e., all causes) presented in table 29.
c/ Due to rounding, addends do not sum to total.

Impact on Public Safety

We received comments regarding the proposed Cheyenne Connector pipeline's potential safety impacts on residents living in proximity to the pipeline. Cheyenne Connector would design, construct, and operate all facilities associated with the Pipeline Project, including the Cheyenne Connector pipeline, in accordance with the DOT's safety standards specified in 49 CFR 192. Thus, the Cheyenne Connector pipeline would be operated in compliance with all applicable federal safety regulations.

The service incidents data summarized in table 29 include natural gas transmission system failures of all magnitudes with widely varying consequences.

Table 31 presents the annual injuries and fatalities that occurred on natural gas transmission lines from incidents for the 5 year period between 2011 and 2015. The majority of fatalities from pipelines are due to local distribution pipelines not regulated by FERC. These are natural gas pipelines that distribute natural gas to homes and businesses after transportation through interstate natural gas transmission pipelines. In general, these distribution lines are smaller diameter pipes and/or plastic pipes which are more susceptible to damage. Local distribution systems do not have large rights-of-way and pipeline markers common to the FERC-regulated natural gas transmission pipelines. Therefore, incident statistics inclusive of distribution pipelines are inappropriate to use when considering natural gas transmission projects.

Table 31
Injuries and Fatalities – Natural Gas Transmission Pipelines a/

Year	Injuries		Fatalities	
	Employees	Public	Employees	Public
2011	1	0	0	0
2012	3	4	0	0
2013	0	2	0	0
2014	1	0	1	0
2015	12	2	6	0

a/ Source: PHMSA, 2015.

The nationwide totals of accidental fatalities from various anthropogenic and natural hazards are listed in table 32 in order to provide a relative measure of the industry-wide safety of natural gas transmission pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. The data nonetheless indicate a low risk of death due to incidents involving natural gas transmission pipelines compared to the other categories. Furthermore, the fatality rate is much lower than the fatalities from natural hazards such as lightning, tornados, or floods.

Table 32
Nationwide Accidental Fatalities by Cause

Type of Accident	Annual Number of Deaths
All unintentional deaths	146,571
Motor vehicle a/	35,369
Poisoning a/	38,851
Falls a/	30,208
Pedestrian-vehicle crash b/	5,977
Drowning a/	3,391
Fire, smoke inhalation, burns a/	2,760
Floods c/	81
Tornado c/	72
Lightning c/	49
Hurricane c/	47
Natural gas distribution lines d/	13
Natural gas transmission pipelines d/	2

a/ Accident data presented for motor vehicle, poisoning, falls, drowning, fire, smoke inhalation, and burns represent the annual accidental deaths recorded in 2013. Source: Centers for Disease Control and Prevention, 2013.
b/ Source: National Highway Traffic Safety Administration, 2018.
c/ Accident data presented for floods, tornados, lightning, and hurricanes represent the 30-year average of accidental deaths between 1985 and 2014. Source: National Oceanic and Atmospheric Administration, 2016.
d/ Accident data presented for natural gas distribution lines and transmission pipelines represent the 20-year average between 1996 and 2015. Source: PHMSA, 2018b.

The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation. From 1996 to 2015, there were an average of 65 significant incidents, 9 injuries, and 2 fatalities per year. The number of significant incidents over the more than 303,000 miles of natural gas transmission lines indicates the risk is low for an incident at any given location. The operation of the Projects would represent a slight increase in risk to the nearby public.

11. Cumulative Impacts

In accordance with NEPA and with FERC policy, we identified other actions in the vicinity of the Projects' facilities and evaluated the potential for a cumulative impact on the environment. As defined by the CEQ, a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of the agency or party undertaking such other actions. Cumulative impacts can result from individually minor, but collectively significant actions, taking place over time. The CEQ guidance states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions (CEQ, 1997). In this analysis, we consider the impacts of past projects within defined areas of influence as part of the affected environment (environmental baseline), which were described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are also considered.

Our cumulative effects analysis focuses on potential impacts from the proposed Projects on resource areas or issues where the incremental contribution could result in cumulative impacts when added to the potential impacts of other actions. To avoid unnecessary discussions of insignificant impacts and projects and to adequately address and accomplish the purposes of this analysis, an action must first meet the following three criteria to be included in the cumulative analysis:

- affects a resource also potentially affected by the Projects;
- causes this impact within all, or part of, the Projects' areas defined by the resource-specific geographic scope; and
- causes this impact within all, or part of, the time span of the proposed Projects' estimated impacts.

As described in our analysis above within section B of this EA, constructing and operating the Projects would affect the environment on both short-term/temporary and long-term/permanent bases. The Projects would affect geology, soils, water resources, wetlands, vegetation, wildlife (including special status species), socioeconomics, some land uses, air quality, and noise.

Table 33 below summarizes the resource-specific geographic boundaries ("scopes") that were considered in this analysis, and the justification for each. Actions

outside of these boundaries are generally not evaluated because their potential to contribute to cumulative impacts diminishes with increasing distance from the Projects.

Table 33
Cumulative Impact Resource-Specific Geographic Scopes

Resource	Cumulative Impact Geographic Scope and Justification
Geological Resources and Soils	For geological resources and soils, potential impacts include the area of disturbance of the Projects (i.e., the construction workspaces) overlapping or immediately abutting the workspaces of other actions.
Surface Water Resources and Wetlands	Impacts on water resources and wetlands are traditionally assessed on a watershed level, defined by the watershed boundary (HUC 12), to assess potential overlapping impacts from sedimentation, turbidity, and general water quality impacts.
Groundwater, Vegetation, Wildlife, and Special Status Species	The watershed level provides a natural boundary and a geographic proxy to accommodate general wildlife habitat and ecology characteristics in the Projects' areas; therefore, impacts of other actions on vegetation, wildlife, and special status species are evaluated in combination with the Projects within the HUC-12 watershed boundary, as recommended by CEQ.
Land Use, Recreation, Traffic, and Visual Resources	Impacts of other actions in combination with the Projects are evaluated within a 1-mile radius from the Projects' work areas to encompass large areas with specialized or recreational uses.
Socioeconomics	Impacts on socioeconomic conditions typically include entire counties, as demographic statistics are generally assessed on a county basis. Therefore, socioeconomic impacts of the Projects in combination with other projects are evaluated within the boundary of Weld County.
Air Quality	Construction impacts include other actions within 0.25 mile from the Projects' workspaces. Operational impacts include all sources within 50 kilometers of facilities having potential emission rates of pollutants capable of elevating existing background concentrations, which for this analysis includes the proposed modified Cheyenne Hub.
Noise	Construction impacts include other actions within 0.25 mile from the proposed Projects' earth-disturbing equipment work (other than HDDs), and within 0.5 mile from proposed HDD entry and exit points, based on our knowledge of typical construction equipment. Operational impacts include other actions that would contribute a noise impact on any NSA within a 1-mile radius of the proposed modified Cheyenne Hub and within a 0.5-mile radius of each of the proposed M&R stations, based on our knowledge of similar facilities.

11.1 Other Actions identified within the Geographic Scope

As part of the information gathering process for table 33, the Applicants obtained information concerning recently completed natural gas projects in the Projects' areas. We reviewed the Weld County government's website and conducted web searches to identify recently completed, ongoing, and planned road or other major construction projects affecting one or more resources within the Projects' geographic scopes (Weld County, 2018).

The Town of Kersey also provided comments concerning planned public projects and commercial developments in proximity to the proposed Pipeline Project right-of-way, including a planned sewer line, which we have included in table 34. Cheyenne

Connector responded that it is working with the Kersey Town Manager to minimize impacts related to the Town's proposed developments.

Recently completed, present, and reasonably foreseeable projects summarized in table 34 include the following types of actions falling within applicable geographic scopes defined in table 33:

- several roadway improvement projects;
- four natural gas pipeline projects;
- one new natural gas processing plant;
- one petroleum pipeline project;
- planned residential and commercial development projects;
- one planned sewer line;
- an expansion of an existing solid waste disposal facility;
- oil waste disposal facilities;
- commercial/residential zoning and developments;
- composting, truck parking, and horse racing facilities;
- oil and gas development support facilities;
- ongoing oil and gas exploration and production activities; and
- ongoing agricultural activities.

Table 34
Recently Completed, Present, and Reasonably Foreseeable Actions Considered for Cumulative Impacts within the Geographic Scope of the Projects

Sponsor/Local Planning Authority (Status)	Location	Description	Potential Contribution to Cumulative Impacts
Projects' non-jurisdictional facilities constructed by United Power, Xcel Energy, Poudre Valley Rural Electric Association (see section A.8 and table 4 of this EA)	Adjacent to proposed Lancaster, Latham, Mewbourn, M&R Stations and MLV #1	electric power lines	soils, geology, surface water, wetlands, vegetation, wildlife, land use (construction and operation), socioeconomics, air quality and noise (construction)
Weld County Public Works Department ─ highway projects (completed December 2017 [WCR 49]; planned for 2019 [WCR 29]; other projects either recently completed, present, or planned [e.g., WCR 47, WCR 54])	Weld County ─Greeley and Kersey vicinities	various paving, widening, and other road improvement projects	surface water, wetlands, vegetation, wildlife, land use (construction and operation), socioeconomics, air quality and noise (construction)
Weld County Planning Department ─ current planning cases (applications under review)	Weld County	oil waste disposal facilities; expansion of a solid waste disposal facility; natural gas pipeline and production facilities (including a new Latham Gas Processing Plant proposed by Anadarko); composting facilities; subdivisions and other building construction; oil and gas/mineral resource development support facilities; truck parking facilities; horse racing facilities	surface water, wetlands, vegetation, wildlife, land use (construction and operation), socioeconomics, air quality and noise (construction)
Colorado Interstate Gas Company, LLC ─ CIG 2018 Line Nos. 5A and 5B Expansion Project, FERC Docket No. CP18-94-000 (in active construction as of date of issuance of this EA)	Weld County	modification of CIG's Cheyenne Hub compressor facilities within CIG's Cheyenne Hub yard; no new compression	surface water, wetlands, vegetation, wildlife, land use
Kaiser-Frontier Midstream, LLC ─ Silo Natural Gas Pipeline, FERC Docket No. CP15-26-000 (placed into service June 2016)	Laramie County, Wyoming and Weld County	6.8 miles of 6-inch-diameter natural gas pipeline and 14.5 miles of 8-inch-diameter pipeline	surface water, wetlands, vegetation, wildlife, land use
Magellan LP ─ Saddlehorn and Grand Mesa Pipelines (completed 2016)	points between Weld County and Cushing, Oklahoma	crude oil pipeline project (length not specified)	surface water, wetlands, vegetation, wildlife, land use
Colorado Interstate Gas Company, LLC ─ High Plains 2013 Expansion Project, FERC Docket No. CP12-496-000 (placed into service 2014)	Weld County	7.8 miles of 24-inch-diameter natural gas pipeline and two meter stations, and facility upgrades	surface water, wetlands, vegetation, wildlife, land use
DCP Midstream, LLC ─ Lucerne Residue Pipeline Project, FERC Docket No. CP13-509-000 (placed into service 2014)	Weld County	7.6 miles of 16-inch-diameter natural gas pipeline and associated facilities	surface water, wetlands, vegetation, wildlife, land use
Town of Kersey – multiple infrastructure and residential/commercial development projects (active or planned)	Town of Kersey	residential neighborhood projects; commercial development projects; sewer line	Surface water, wetlands, vegetation, wildlife, land use, air quality and noise (construction)
oil and gas exploration and production (extensive and ongoing)	Weld County	approximately 700 permitted wells within 0.25 mile of the Projects' disturbance areas; abundant oil and gas infrastructure (e.g., gathering lines, access roads, gas processing facilities, etc.) in the immediate Projects' areas; over 22,000 active oil and gas wells within Weld County (Weld County, 2018a)	surface water, wetlands, vegetation, wildlife, land use (construction and operation), socioeconomics, air quality and noise (construction)
agricultural activities (ongoing)	Weld County	various agricultural operations, irrigated croplands, livestock rearing and grazing	surface water, wetlands, vegetation, wildlife, land use

11.2 Potential Cumulative Impacts of the Proposed Project

The actions considered in our cumulative impact analysis identified in section B.11.1 may vary from the proposed Projects in nature, magnitude, and duration. These actions are included based on the likelihood of their impacts coinciding with the Project's impacts, which means that these other actions have current or ongoing impacts or are "reasonably foreseeable." The actions we considered are those that could affect similar resources within the same geographic scope defined in table 33, and during the same timeframe as the Projects. The anticipated cumulative impacts of the Projects and these other actions are discussed below, as well as mitigation actions that the Applicants would follow to reduce those impacts.

We find that the proposed Projects could potentially result in cumulative impacts within the resource areas of geology and soils, groundwater, surface water, fisheries, vegetation, wildlife, land use, socioeconomics, cultural resources, air quality, noise, and climate change, as discussed below. The proposed Projects' facilities could contribute to these cumulative impacts; however, the Applicants would minimize adverse impacts of the Projects by implementing mitigation measures identified in section B of this EA, including co-locating the proposed pipeline adjacent to existing rights-of-way for approximately 46 percent of its route.

Geology and Soils

As the Projects' impacts on geology and soils would be highly localized and limited primarily to the Projects' footprints during the period of active construction, cumulative impacts on geology and soils would only occur if other geographically overlapping projects were constructed at the same time (and place) as the Projects (and the exposure of soils to erosion and sedimentation) occurs. Four actions identified in table 34 fall or could fall within the geographic and temporal scopes for geology and soils, including the Projects' non-jurisdictional facilities, various Town of Kersey development projects, various Weld County development projects, and the ongoing mineral resource development.

Cumulative impacts from mineral resource development would only occur if other projects are constructed at the same time and place as the proposed facilities. The non-jurisdictional facilities would be constructed adjacent to Project facilities and would consist of minor electric grid additions and improvements with limited footprints that would not significantly add to cumulative soil and geology impacts.

To the extent that ground-disturbing activities for any abutting or overlapping Weld County and Town of Kersey projects occur at the same time as construction of the Projects (which, according to the Town's comments, we understand could be likely), there would be a minor cumulative increase in the potential for soil erosion from stormwater, high winds, or other soil impacts. However, the Applicants' Projects would implement BMPs (such as the FERC Plan) to limit erosion and sedimentation. We

expect that other projects would implement BMPs as well, in accordance with any applicable Weld County or Town of Kersey permitting protocols. We believe that the measures the Applicants would adopt to minimize impacts on soils would prevent any significant contribution to cumulative impacts on geology and soils from the Projects in consideration with the other identified actions.

Groundwater

Construction of the Projects could result in minor and temporary impacts on groundwater infiltration due to tree, herbaceous vegetation, or scrub-shrub vegetation clearing. If temporary impacts occur, it would likely be limited to short-term turbidity visible in groundwater or reduced infiltration. We also anticipate that the Applicants' SPRPs would prevent or minimize the opportunity for and necessitate immediate control and clean-up of spills of fuels, lubricants, or other hazardous material, and would therefore minimize the opportunity for cumulative impacts that could result if other projects were to also result in spills. Such spills, if any were occur within the same vicinity as the Projects, would be infrequent, difficult to predict, and would likely be cleaned up in accordance with requirements that apply to those other projects. For these reasons, we conclude that any cumulative impact on groundwater from the Projects would be negligible.

Surface Water Resources and Wetlands

Construction and operation of the Cheyenne Connector Pipeline would mainly result in only short-term impacts on surface water resources (see section B.3.2). These impacts, such as increased turbidity, would return to baseline levels over a period of days or weeks following construction. Longer-term impacts could also occur until adjacent disturbed areas are stabilized through revegetation. Cheyenne Connector would minimize these effects by implementing specific waterbody construction and mitigation measures, including temporary and permanent erosion controls contained FERC's Plan and Procedures, SPRP, and *HDD Inadvertent Return Contingency Plan* (appendix E) and by complying with applicable federal and state permits requirements.

The projects in table 33 are within the geographic scope (HUC-12 subwatershed) of the Cheyenne Connector, and most would likely also occur within the same temporal scope, meaning a cumulative impact on surface waters could occur from one or more of these projects. The projects listed in table 34 would individually result in temporary impacts on surface water mostly through the linear construction activities across streams and temporary erosion and sedimentation of exposed soils. For these reasons, we anticipate that the Cheyenne Connector Project, when combined with these other projects, would only have a minor and temporary contribution to cumulative impact on surface waters. All FERC-regulated natural gas projects are held to similar robust standards for construction across waterbodies; erosion control; and measures for avoiding, containing, and clean-up of hazardous materials. Non-FERC-regulated projects

also would be expected to conform with state and local National Pollutant Discharge Elimination System requirements, at a minimum. The Enhancement Project would not impact surface water resources, and as such, would not contribute to cumulative impacts on surface water.

Impact on wetlands resulting from construction of the Cheyenne Connector would be generally localized and short-term (see discussion in section B.3.2). The projects listed in table 34 could be required by the terms and conditions of their respective Clean Water Act Section 404 authorization and state permits to provide compensatory mitigation for unavoidable wetland impacts. These other projects would take steps to avoid and minimize wetland impacts through implementing a wetland construction plan, mitigation measures, and BMPs, resulting in only minor impacts on wetlands.

Of the 5.2 acres of wetlands affected by construction of the Cheyenne Connector, all are PEM wetlands, which, after construction is completed would revert back to, and maintained, as herbaceous communities. Because Cheyenne Connector would implement FERC's Plan and Procedures and its SPRP, we expect that PEM wetlands would revert to pre-construction conditions within one or two years. We conclude that the impact on wetlands from the Cheyenne Connector would only have a negligible contribution to overall minor and temporary cumulative impacts on wetlands when combined with the other projects. Therefore, any cumulative impacts on wetlands are expected to be negligible.

Fisheries, Vegetation, and Wildlife

Sedimentation and turbidity caused by multiple projects in the same watershed could result in cumulative impacts on fish and aquatic species through alteration of habitat and changes to the aquatic environment. Cheyenne Connector would implement erosion and sediment controls during construction to minimize impacts on aquatic habitats. Therefore, we do not expect that the Pipeline Project would contribute significantly to cumulative impacts on fisheries or aquatic wildlife. The Enhancement Project would not impact surface water resources, and as such, would not contribute to cumulative impacts on any aquatic resources.

Multiple projects occurring within similar geographic areas and construction timelines could result in cumulative impacts on forest, vegetation communities, and wildlife habitat. In general, the impacts from forest clearing are long-term and loss of forested areas results in various changes to ecosystem functions. Clearing of vegetation can also result in changes in vegetation communities over the long term and introduce the spread of invasive species. Multiple projects occurring in the same area can cumulatively increase the chance for introduction and spread of invasive or noxious plants. To prevent further spread of noxious weeds that may occur during the Projects, the Applicants would implement BMPs and a *Weed Management Plan* during construction and operation.

Fourteen HUC-12 watersheds would be crossed by the Pipeline Project. The Projects would affect herbaceous communities (573 acres), shrubland communities (0.4 acre) and forest (9.5 acres) within these watersheds. Other past, present, or reasonably foreseeable projects in these watersheds have affected or would affect similar vegetation communities. Restoration for some of the projects is already complete or would be complete before the construction of the proposed Projects commences. Forested areas may take decades to return to pre-construction conditions, but herbaceous communities would only take a few growing seasons to regenerate. Because most of the vegetation affected by the Projects is herbaceous we do not expect any long-term cumulative impacts on vegetation as a result of the Projects when considered with other projects in the geographic scope.

The loss of forested areas, vegetation communities, and wetlands can result in cumulative impacts on habitat for wildlife and sensitive species. Due to the prevalence of similar habitat in close proximity and the Applicants' commitment to restore temporary workspace and permanent pipeline right-of-way to pre-construction herbaceous communities, we expect that the Projects would not significantly contribute to cumulative impacts on wildlife when considered with other projects in the geographic scope. Protection of threatened, endangered, and special status species is part of the federal and state permitting process, so cumulative impacts on those species would be minimized through conservation and mitigation measures identified through individual consultations.

Land Use, Traffic, and Visual Resources

As described in section B.6.4, land use impacts from the Projects' construction are expected from the conversion of agricultural or open land to industrial use at the location of aboveground facilities, and the encumbrance of the pipeline right-of-way from the construction of new structures.

Foreseeable future projects that may impact land use within the geographic area and time frame of the Projects include electric power line installations, the extension of WCRs 49 and 47, projects for which applications have been received by the Weld County Planning Department, projects identified by the Town of Kersey, and ongoing oil and gas exploration and production in Weld County. As identified in section A.8, local electric utilities would need to extend electrical service to the new Lancaster, Latham, Mewbourn, and O'Connor M&R Stations and to MLVs #1, 2, and 3. These lines would be expected to be overhead and would be extended from an existing power pole along existing road or utility rights-of-way, or would require the establishment of a new dedicated easement. While some existing land uses such as transportation or agriculture may be able to continue in these electric transmission easements, other uses such as the erection of structures may be prohibited. These new power lines would be small in scale, varying in length from 10 to 1,500 feet. In consideration of the relatively rural nature of

the Projects' areas, the restrictions on land use from these new non-jurisdictional power lines would not be significant.

Portions of three proposed roadway development projects may also be within the Pipeline Project's geographic and temporal scope, and result in cumulative land use impacts. In 2017, the Weld County Parkway Project expanded north-south capacity on CSH 49 between Interstate Highway 76 and WCR 60.5. This project, which parallels part of the Pipeline Project, was completed in 2017 and is now part of the baseline environment. Weld County also is improving north-south WCR 47 between WCR 60 1/2 and CSH 392 north and east of the Greeley Airport. Although WCR 47 is more than 1 mile from the proposed Pipeline Project right-of-way, Cheyenne Connector's Eaton Rail Storage Yard would be in close proximity to the WCR 47 project. The WCR 47 Project involves a widening and access control improvements to this portion of WCR 47 and was initiated in early 2018 and completed by late 2018. A third project, currently in the study phase, would be the Freedom Parkway Project, which would improve WCR 54 between WCR 49 west of the Town of Kersey to Interstate Highway 25 west of the Weld County line. The schedule for implementing the Freedom Parkway Project is pending future County action.

Several of the projects identified by Weld County, and in particular the projects identified by the Town of Kersey, would also be cumulative with the proposed Projects' estimated land use impacts. Cheyenne Connector has designed the Pipeline Project to avoid conflict with the Town's planned sewer line, and would work with the Town of Kersey to ensure that the impacts on the town's planned land use zoning for commercial and residential developments are minimized.

Table 34 also identifies extensive and ongoing oil and gas exploration and production activities as potentially contributing to cumulative impacts on land use. As previously discussed, southern Weld County has been undergoing substantial change due to the development of oil and natural gas production facilities. Natural gas infrastructure, including gathering lines and processing and storage facilities, have been developed throughout this area. This development includes approximately 700 permitted extraction wells within 0.25 mile of the Project's construction disturbance areas. These projects have resulted in both temporary disturbance of agricultural and open lands for pipelines and access roads, and the permanent conversion of lands to aboveground oil and gas facilities. These development activities have occurred in the past, are currently ongoing, and are expected to continue into the future. Construction of the Pipeline Project would result in the temporary disturbance of approximately 1,650 acres of land and the permanent conversion of 438 acres to natural gas facility use. The Projects would contribute on a cumulative basis to continuing permanent conversion of agricultural, herbaceous, shrubland, and otherwise undeveloped land uses to industrial land uses in Weld County associated with the development of the Denver-Julesburg Oil and Natural Gas Basin.

We conclude that the Cheyenne Connector and Cheyenne Hub Enhancement Projects, combined with past and proposed electric line, roadway, and other planned projects identified by Weld County and the Town of Kersey, would add to cumulative impacts on land use within the geographic and temporal scope; however, these impacts would not be significant relative to the existing highly modified landscape that characterizes much of Weld County, including the areas in which the Projects would be located, which are dominated by widespread agricultural usage as well as extensive oil and gas exploration, production, and transmission infrastructure.

Traffic would be temporarily impacted during construction of the Projects. Several commercial, industrial, or infrastructure projects listed in table 34, including potentially some of the proposed projects currently under review by the Weld County Planning Department, as well as the residential and infrastructure projects either planned in the near term or currently in active construction within or near the Town of Kersey, could also impact local traffic if constructed during the same general timeframe as the Projects. Non-jurisdictional facility construction could also result in some minor cumulative traffic impacts.

The Projects' cumulative traffic impacts on local roads would be limited primarily to the areas near each active construction spread along the Cheyenne Connector Pipeline, each of the M&R Station construction sites, and along the CSH 85 near the Enhancement Project site, and would cease following completion of the Projects' construction. Therefore, although traffic impacts from the construction of Projects could cause some added congestion on regional roadways within Weld County during the expected 7-month construction period, we do not expect that the Projects' contribution to overall cumulative impacts on local traffic to be significant.

As we conclude in section B.5, each of the proposed M&R stations and the Enhancement Project facilities would be constructed in close proximity to existing aboveground natural gas facilities, and would thus result in minor permanent impacts on the visual character of the areas surrounding these facilities. The Cheyenne Connector Pipeline's permanent right-of-way and MLVs, although these facilities would visible from local roadways, would not appreciably alter the existing highly modified landscape of Weld County noted above. The Projects' visual impacts could be cumulative with some projects identified in table 34, such as the commercial and residential developments identified by the Town of Kersey, projects identified by the Weld County Planning Department, and continued development of oil and gas exploration infrastructure. However, due to the presence of existing natural gas transmission and production infrastructure in proximity of the proposed Projects' aboveground facilities, and the already highly modified nature of the Projects' areas, we conclude that the Projects would not result in significant cumulative visual impacts.

Socioeconomics

Table 34 identifies the non-jurisdictional electric lines serving the M&R stations as projects that may have socioeconomic effects within the geographic and temporal scope of the Projects. These electric power distribution lines would be constructed by local electric utilities using staff or contract line workers who already reside in the Projects' areas, and whose effect on socioeconomic conditions is already accounted for in the baseline housing, economic, public services, and infrastructure conditions. Similarly, the Weld County Department of Public Works plans a number of bridge and roadway projects that may occur within the County during the temporal scope of the Projects. In addition, the Weld County Planning Department lists on its website several applications for planned oil and gas/industrial, residential/commercial, municipal, and other types of construction projects, currently under County review. We expect that these projects would be constructed by area-based highway and related construction companies with the equipment and expertise to construct bridges and other roadway facilities, commercial and residential buildings, oil and gas support facilities, and other firms specializing in the particular projects planned. To the extent that these specialized workers reside in Weld County, their effect on socioeconomic conditions is already accounted for in the baseline housing, economic, public services, and infrastructure conditions.

As concluded in section B.6, socioeconomic impacts from Project construction and operation are expected to be minimal. No unaccounted for socioeconomic impacts are expected from any other projects listed in table 34, as they have been completed, or are ongoing. Therefore, we conclude that the Projects would result in a minimal cumulative impact on socioeconomics within the geographic scope.

Cultural Resources

Cumulative impacts would occur if the Cheyenne Connector and Cheyenne Hub Enhancement Projects and another project were to result in overlapping effects on a cultural resource. Because no cultural resources were identified for the Cheyenne Hub Project, and Cheyenne Connector would avoid impacts on the identified historic properties and potential historic properties, the Projects would not contribute to cumulative impacts on cultural resources.

Air Quality

As discussed in section B.8.5, the proposed Cheyenne Hub Booster Compressor Station and M&R stations would be operational sources of air emissions (chiefly from the compressor station) as well as minor amounts of fugitive emission releases from various valves and fittings, and periodic maintenance activities at each of the stations; and these emissions would impact air quality.

Depending on the timing of construction, one or more of the projects identified in applications filed with the Weld County Planning Department, projects identified by the

Town of Kersey, certain portions of the planned roadway projects, and ongoing oil and gas exploration and development projects may overlap with the Pipeline Project's construction within the defined 0.25-mile geographic scope for construction-related air quality impacts, and result in cumulative and localized air quality-related impacts on nearby receptors. The Pipeline Project's contribution to cumulative impacts combined with these identified activities, if any, would be temporary and minor, persisting only as long as both the Pipeline Project and other project(s) were in active construction in those areas.

For purposes of estimating potential cumulative operational impacts of the Enhancement Project, including the Cheyenne Hub Booster Compressor Station and other major point sources of air emissions within the geographic scope, Rockies Express performed a refined modeling analysis, summarized in section B.8.5, which concluded that concentrations of all criteria air pollutants would remain below NAAQS levels when combined with ambient concentrations at all points outside the compressor station's (and modified Cheyenne Hub's) fenceline boundary. We are not aware of any projects listed in table 34 that involve the construction and operation of major point sources of emissions that could result in locally cumulative air impacts with the modified Cheyenne Hub; however, many of the planned commercial, residential, and industrial projects in table 34 would result in some elevation of the Enhancement Project's regional ambient air concentrations through operation of passenger vehicles to and from the planned developments, any fossil fuel-fired equipment (boilers, heaters, furnaces, stoves, etc.) associated with these developments, and activities associated with any additional oil and gas exploration not already accounted for in the ambient air quality baseline used to determine the Enhancement Project's compliance with the NAAQS. However, based on Rockies Express' proposed modified Cheyenne Hub's estimated contribution to current ambient air concentration levels, the Enhancement Project would not result in a significant cumulative impact on regional air quality.

Noise

Depending on the timing of construction, one or more of the projects identified in applications filed with the Weld County Planning Department, projects identified by the Town of Kersey, certain portions of the planned roadway projects, and ongoing oil and gas exploration and development projects may overlap with the Pipeline Project's construction within the defined 0.25-mile geographic scope for construction noise impacts, and result in cumulative noise impacts on nearby receptors. However, most impact from construction of the Projects would be minor and temporary, and persist only for time periods that active construction of the Pipeline Project and other projects were simultaneously taking place.

As stated in section B.9.2, noise from the proposed HDDs associated with the Pipeline Project would result in sustained noise impacts at nearby NSAs, potentially occurring on a 24 hour per day basis. Therefore, noise from the HDDs, if occurring

simultaneously with noise from construction of projects identified by the Weld County Planning Department and the Town of Kersey, could result in cumulative noise impacts at nearby NSAs, particularly if any of these projects were to contribute nighttime noise impacts. The remaining projects identified in table 34 are recently completed projects no longer in active construction; thus, construction-related noise impacts do not apply.

Some of the oil and gas production facilities identified in table 34 may have the potential to result in cumulative operational noise impacts with the proposed Enhancement Project facilities and modified Cheyenne Hub. However, any ongoing oil and gas production operations, if within the geographic scope in table 33 for which cumulative noise impacts may potentially occur, would have been included in the ambient background noise levels recorded in the acoustic analysis for the station, discussed in section B.9.3. It is possible, however, that new oil and gas production facilities could be planned within the 1-mile geographic scope of NSAs also within 1 mile of the expansion area of the proposed Enhancement Project, which could impact the NSA approximately 3,300 feet north-northwest from the Enhancement Project. Although some of the planned projects identified by the Weld County Planning Department would likely produce noise during operation, none are known to occur within the geographic scope for the Projects. The Enhancement Project, when combined with any other planned projects within the geographic scope, could result in cumulative noise impacts at NSAs. As discussed in section B.9.3, the proposed M&R stations' noise contributions at nearby NSAs would be minimal; therefore, the potential for the M&R stations to result in cumulative noise impacts with other projects identified in table 34 is also minimal.

Climate Change

Climate change is the change in climate over time, and cannot be represented by single annual events or individual weather anomalies. While a single large flood event, a particularly cold summer, or warm winter are not necessarily strong indications of climate change, a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change. However, recent research has begun to attribute certain extreme weather events to climate change (U.S. Global Change Research Program, 2017).

Climate change has already resulted in a wide range of impacts across every region of the United States and those impacts extend beyond atmospheric climate change alone and include changes to water resources, agriculture, ecosystems, and human health. As climate change is currently happening, the United States and the world are exhibiting warming trends; global sea level is rising and acidifying; and certain extreme weather events are becoming more frequent and more severe. These changes are driven by accumulation of GHGs in the atmosphere primarily through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agricultural emissions and clearing of forests. These impacts have accelerated throughout the end of the 20th, and into the 21st

century. Climate change is a global concern; however, for this analysis, we will focus on the potential cumulative climate change impacts on the Projects' areas.

The following observations of environmental impacts having medium to very high levels of confidence are attributed to climate change in the Southwest region[22] (U.S. Global Change Research Program, 2018 and 2017; Gonzalez, 2018; National Oceanic and Atmospheric Administration, 2017):

- water for people and nature in the Southwest has declined during droughts, due in part to human-caused climate change. Intensifying droughts and occasional large floods, combined with critical water demands from a growing population, deteriorating infrastructure, and groundwater depletion, suggest the need for flexible water management techniques that address changing risks over time, balancing declining supplies with greater demands;

- the integrity of Southwest forests and other ecosystems and their ability to provide natural habitat, clean water, and economic livelihoods have declined as a result of recent droughts and wildfire due in part to human-caused climate change. GHG emissions reductions, fire management, and other actions can help reduce future vulnerabilities of ecosystems and human well-being;

- many coastal resources in the Southwest have been affected by sea level rise, ocean warming, and reduced ocean oxygen—all impacts of human-caused climate change—and ocean acidification resulting from human emissions of CO_2. Homes and other coastal infrastructure, marine flora and fauna, and people who depend on coastal resources face increased risks under continued climate change;

- traditional foods, natural resource-based livelihoods, cultural resources, and spiritual well-being of Indigenous peoples in the Southwest are increasingly affected by drought, wildfire, and changing ocean conditions. Because future changes would further disrupt the ecosystems on which Indigenous peoples depend, tribes are implementing adaptation measures and emissions reduction actions;

- the ability of hydropower and fossil fuel electricity generation to meet growing energy use in the Southwest is decreasing as a result of drought and rising temperatures. Many renewable energy sources offer increased electricity reliability, lower water intensity of energy generation, reduced greenhouse gas emissions, and new economic opportunities;

- food production in the Southwest is vulnerable to water shortages. Increased drought, heat waves, and reduction of winter chill hours can harm crops and

[22] The USGCRP's "Southwest" region includes Colorado in the northeast portion of its defined geographic area.

livestock; exacerbate competition for water among agriculture, energy generation, and municipal uses; and increase future food insecurity; and

- heat-associated deaths and illnesses, vulnerabilities to chronic disease, and other health risks to people in the Southwest result from increases in extreme heat, poor air quality, and conditions that foster pathogen growth and spread. Improving public health systems, community infrastructure, and personal health can reduce serious health risks under future climate change.

The FERC staff has presented the direct and indirect GHG emissions associated with construction and operation of the Projects in section B.8.5.

The construction and operation of the proposed Projects would increase the atmospheric concentration of GHGs, in combination with past and future emissions from all other sources, and contribute incrementally to future climate change impacts. However, there is no standard methodology to estimate the extent to which a project's incremental contribution to greenhouse gas emissions would result in physical effects on the environment for the purposes of evaluating the Projects' impacts on climate change, either locally or nationally, nor are there generally accepted criteria for determining whether a project's GHG emissions are significant under NEPA. In addition, we cannot find a suitable method to attribute discrete environmental effects to greenhouse gas emissions. We have looked at atmospheric modeling used by the Intergovernmental Panel on Climate Change, EPA, National Aeronautics and Space Administration, and others and we found that these models are not reasonable for project-level analysis for a number of reasons. For example, these global models are not suited to determine the incremental impact of individual projects, due to both scale and overwhelming complexity. Therefore, we cannot determine whether the Project's contribution to climate change would be significant.

C. ALTERNATIVES

In accordance with NEPA and Commission policy, we evaluated alternatives to the Projects to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives included the no-action alternative, system alternatives, route alternatives and variations, and aboveground facility design alternatives. The evaluation criteria used for developing and reviewing alternatives were:

- ability to meet the Projects' stated objective;
- technical and economic feasibility and practicality; and
- 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. To ensure a consistent environmental comparison and to normalize the comparison factors, we generally use desktop sources of information (e.g., publicly available data, geographic information system data, aerial imagery) and assume the same general workspace requirements.

We reviewed alternatives against the evaluation criteria in the sequence presented above. The first consideration for including an alternative in our analysis is whether or not it could satisfy the stated purpose of the Projects. An alternative that cannot achieve the purpose for the Projects cannot be considered as an acceptable replacement for the Projects. The second evaluation criteria is feasibility and practicality. Many alternatives are technically and economically feasible. Technically practical alternatives, with exceptions, would generally require the use of common construction methods. An alternative that would require the use of a new, unique, or experimental construction method may not be technically practical because the required technology is not available or is unproven. Economically practical alternatives would result in an action that generally maintains the price competitive nature of the proposed action. Generally, we do not consider the cost of an alternative as a critical factor unless the added cost to design, permit, and construct the alternative would render a project economically impractical.

Alternatives that would not meet the Projects' objective or were not feasible were 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. The determination must then balance the overall impacts and all other relevant considerations. In comparing the impact between resources, we also considered the degree of impact anticipated on each resource. 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.

Based on our analysis in this EA, we have determined that the proposed site for the Cheyenne Hub Booster Compressor Station is a suitable and appropriate location, placed directly adjacent to Rockies Express' existing Cheyenne Hub facilities, and that construction would not result in significant environmental impacts. Similarly, the sites for Cheyenne Connector's proposed Lancaster, Latham, Mewbourn, O'Connor, and Cheyenne Connector M&R Stations have been selected to be proximal to existing natural gas facilities, and would only result in minimal environmental impacts. We did not receive any comments on or objections to the proposed sites, nor did we receive any suggested alternative locations. As such, we did not evaluate site alternatives for these facilities.

1. No-Action Alternative

Under the no-action alternative, the Applicants would not construct or operate the Projects and none of the impacts associated with the Projects would occur. However, the Projects' objectives would not be met. The Applicants would not be able to meet the Projects' stated need in section A.2, including to move natural gas supplies made available by the Projects' customers (Anadarko and DCP Midstream) in the Denver-Julesburg Basin to Rockies Express' proposed modified Cheyenne Hub, and into the nation's interstate natural gas pipeline network.

Although a Commission decision to deny the proposed action would avoid the environmental impacts addressed in this EA, other natural gas projects could be constructed to take the place of the Projects. Such alternative projects would require the construction of additional and/or new facilities in the same or other locations to meet the Projects' objectives. These alternatives would result in their own set of specific environmental impacts that could be greater or equal to those associated with the current proposal. Therefore, we have dismissed this alternative as a reasonable alternative to meet the Projects' objectives.

2. System Alternatives

The purpose of identifying and evaluating system alternatives is to determine whether the environmental impacts associated with construction and operation of a proposed project could be avoided or reduced by using existing, modified, or other proposed facilities rather than constructing new facilities. However, regardless of any apparent environmental advantages, a viable system alternative must be technically and economically feasible, and must meet the objective(s) of the proposed project, including fulfilling commitments and/or contracts made with project customers.

On April 9, May 23, June 4, and August 31, 2018, CIG filed comments proposing and refining what it has named the "CIG System Alternative." CIG asserts that the CIG System Alternative would "meet the needs of Cheyenne Connector and its shippers but with less environmental disruption and at a lower cost and reduced rates."

According to information on the website of CIG's parent company (Kinder Morgan, Inc.), CIG operates approximately 4,350 miles of pipeline that transports natural gas from production areas in the Rocky Mountains to customers in Colorado and Wyoming and indirectly to the Midwest, Southwest, California, and the Pacific Northwest.[23] In its comments, CIG states that it has continued to pursue business development opportunities across its geographic footprint, including the Denver-Julesburg Basin, a geologic structural basin within which the Projects would be located. As part of its effort, CIG states that since Cheyenne Connector filed its application in March 2018, CIG has conducted several successful open seasons for transportation capacity in northeast Colorado.

Cheyenne Connector and the Projects' intended shippers, Anadarko and DCP Midstream, responded to CIG's filings, as well as to FERC's July 5, 2018 data request, providing information that they contend more accurately estimates ground disturbance, air quality, and noise impacts related to CIG's alternative. Information provided by Cheyenne Connector included a discussion of environmental impacts for a new Solar T70 turbine addition to CIG's Cheyenne Compressor Station that CIG originally included, but subsequently withdrew, as a necessary component of its CIG System Alternative. Informed by intended shipper DCP Midstream's comments, Cheyenne Connector also estimates the length of the lateral pipeline required to serve the Projects' shippers to be approximately 13 miles.

CIG contends that the CIG System Alternative would be capable of providing 600,000 dekatherms (Dth) per day of takeaway delivery capacity, equal to the capacity the Projects would provide to shippers Anadarko and DCP Midstream, as stated in section A.2. An overview of the CIG System Alternative is included as Attachment 1 to CIG's comments filed on August 31, 2018, and within its comments filed on June 4, 2018.[24] The CIG System Alternative would consist of the following three components:

- CIG would expand the northbound capacity on its Line 5C by approximately 336,000 Dth per day, consisting of a combination of additional capacity made available by expiring or re-negotiating contracts for transportation from the Raton Basin and installation of a back pressure valve north of Fort Lupton, Colorado, which would thereby provide the pressure differential to the Wyoming Interstate Company, L.L.C. Cheyenne Hub ("WIC Hub"), and allow receipt volumes north of the installed back pressure valve to free flow north to its Bowie bi-directional meter into the WIC Hub. This component of the CIG System Alternative is identified by CIG as "Project 5C-1";

[23] See https://www.kindermorgan.com/pages/business/gas_pipelines/west/CIG/default.aspx

[24] See Colorado Interstate Gas Company, L.L.C., *Comments of Colorado Interstate Gas Company, L.L.C. and Request for Technical Conference*, Docket No. CP18-102-000, Accession No. 20180831-5197, and *Comments of Colorado Interstate Gas Company, L.L.C.*, Docket No. CP18-102-000, Accession No. 20180604-5124.

- CIG would reverse its Line 5C Cheyenne Compressor Station Solar T60 compressor package to compress north into the WIC Hub through the Bowie meter. This component of the CIG System Alternative, identified by CIG as "Project 5C-2," would add approximately 105,000 Dth per day of available capacity to its system; and
- CIG would use the northernmost 35 miles of its WYCO Development, LLC Front Range Pipeline[25] as a loop line on its Line 5C. This component of the CIG System Alternative identified by CIG as project "5C2-FRPL," would provide an additional 159,000 Dth per day of capacity. CIG indicates that this component also requires that CIG construct approximately 3 miles of lateral pipeline.

CIG asserts that the CIG System Alternative would have a substantially lower environmental impact than the proposed Projects. In table 35, we compared the CIG System Alternative with the Applicants' proposed Projects using information provided by CIG and Cheyenne Connector, and estimating land impacts for various criteria based on our understanding of the pipeline construction that CIG and Cheyenne Connector state would likely be required. Our analysis indicates that CIG's proffered alternative would disturb about 194 acres, compared to the overall 1,723-acre impact for the proposed Projects.[26]

Based on the information at hand, the CIG System Alternative would *appear* to meet the Projects' objective, and we have no reason to conclude it would not be technically and economically feasible. Accordingly, we have applied our third criterion (reviewing the alternative with regard to potential environmental advantages). Based on the estimated resource impacts of the Applicants' Projects and the CIG System Alternative summarized in table 35, the CIG System Alternative would potentially present an environmental advantage because it would involve significantly less new construction than the proposed Projects. Specifically, it could result in a substantially smaller environmental acreage footprint (by an approximate factor of 10), and would likely impact considerably fewer resources such as wetlands and waterbodies; and, given the number of estimated HDDs (1, as compared to 18 for the proposed Projects), would have less noise impacts on NSAs.

The Commission has one of three options regarding the Applicants' proposed action: deny the proposed action, approve it as proposed, or approve it with modifications. We have concluded through our evaluation in Section B of this EA, and our Conclusion in Section D, that the proposed action is environmentally acceptable and would not result in significant environmental impacts. Our analysis above regarding the

[25] CIG identifies this pipeline as its "WYCO Front Range Pipeline"; we understand WYCO to be WYCO Development LLC, which is CIG's joint venture with an affiliate of Xcel Energy. See: https://www.kindermorgan.com/pages/business/gas_pipelines/west/CIG/default.aspx

[26] CIG's assertions regarding customer costs and rates are outside the scope of this EA.

CIG System alternative serves to inform the Commission (as well as the public) of an alternative with potentially fewer environmental impacts than the proposed Projects. The comparison of the Applicants' Projects and the CIG System Alternative set forth in table 35 attempts only to estimate relative environmental impacts, and does not consider the procedures and timelines in which the CIG System Alternative may be evaluated, permitted by relevant permitting agencies, and approved if it were filed before the Commission as a formal application.[27] CIG has not, to date, proposed its system alternative in any formal filing.

Table 35
Comparison of Estimated Impacts of CIG System Alternative and Proposed Projects

Impact Criterion	Applicants' Projects	CIG System Alternative	Basis of CIG System Alternative Impact Estimate
length of pipe required (miles)	70	16	Applicants' estimate of 13 miles of lateral line connecting CIG's system to the proposed O'Connor M&R Station), and CIG's estimate of approximately 3 miles of pipeline needed to complete its project 5C2-FRPL)
Potential operational emissions NO_x for new compression (tpy)	154.7	0	No new compression required for CIG System Alternative a/
temporary land disturbance impacts (acres)	1,723	194 c/	100-foot-wide construction right-of-way (same as that proposed by Cheyenne Connector for the O'Connor M&R Station lateral pipeline)
Permanent right-of-way and aboveground facility impacts (acres)	469.5	97.0	50-foot width
wetlands disturbed (acres)	8.0	0.9	b/
waterbodies crossed (number)	71	8	b/
open water crossed (acres)	3.6	0.4	b/
access roads (number)	91	10	b/
HDD crossings (number)	18	1	b/

a/ In its April 9, May 23, and June 4 filings, CIG included the need to add one new Solar T70 turbine to its existing CIG Cheyenne Compressor Station as part of its proposed alternative. However, on August 31, 2018, CIG modified its system alternative design to eliminate the need to construct additional compression. Therefore, the CIG System Alternative presented by CIG in its August 31, 2018 submittal is reflected here.
b/ Since we have no information identifying the potential location(s) where the CIG System Alternative pipeline would be constructed, we used proportional scaling to estimate these numbers. This estimation assumes similar land use and habitats as would be crossed by the proposed pipeline, and is based on a ratio of overall land disturbance (i.e., 157.6 acres [CIG System Alternative] / 1,723 acres [proposed Projects]).
c/ Cheyenne Connector notes that the estimate of land disturbance, based only on an estimate of required pipeline construction, does not include the potential need for facility modifications to the existing Anadarko and DCP Midstream processing facilities, which may result in additional environmental impacts not included in this estimate. We also note that this estimated acreage does not include additional disturbance due to temporary laydown areas, extra workspaces, and access roads.

[27] A discussion of such potential mechanisms was included in attachment 86 of Applicants' July 25, 2018 filed response to FERC's data request.

3. Major Route Alternatives and Route Variations

Major route alternatives deviate from a proposed project's pipeline alignment for significant portions or follow routes substantially different from the proposed alignment, but the origination and delivery points generally remain the same. Major route alternatives are identified to determine if impacts can be avoided or reduced. Major route alternatives also take into account co-location opportunities with other existing or proposed utility corridors.

Cheyenne Connector's proposed route for the Pipeline Project is co-located with existing utilities for approximately 46 percent of its route. Any major route alternative would likely have equal or greater impact on environmental resources, since Cheyenne Connector's proposed route begins by connecting in roughly linear south-to-north fashion the proposed Lancaster, Mewbourn, and Latham M&R Stations, continues by skirting around the Greeley metro area to the east in close proximity to the proposed O'Connor M&R Station, and then proceeds in fairly linear north- and northwestward directions to the existing Cheyenne Hub. Any major route alternative, even if it could achieve an equal percentage of co-location with existing utilities and accommodation of the proposed M&R station receipt points serving the needs of Cheyenne Connector's shippers, would likely require a longer pipeline and associated lateral lines to the proposed M&R stations, resulting in greater ground disturbance impacts. Therefore, we did not find sufficient cause to evaluate a major route alternative to Cheyenne Connector's proposed Pipeline Project.

Route variations differ from system alternatives or major route alternatives because they are identified to avoid or reduce construction impacts for shorter segments along the proposed route, and specifically considered for localized resource issues. These specific resources issues may include residential or commercial areas, cultural or biological resources, constructability issues, or in response to scoping comments. Because route variations are considered in response to specific issues, they may not always clearly demonstrate a significant environmental advantage other than to reduce impacts on a localized resource or address a landowner preference.

<u>Frazier Route Variation</u>

A landowner, Ms. Janet Frazier, requested a route variation that would avoid impacts on her farm property. Ms. Frazier states that currently, three 12- and 14-inch-diameter pipelines transect her property and that the Pipeline Project would prevent approximately 10 acres along her property's southern border from the possibility of being included within a prospective future housing development. In addition, Ms. Frazier states that the Pipeline Project would disturb an irrigated alfalfa field within the circle of its pivot sprinkler and prairie pasture that, according to Ms. Frazier, takes years to restore.

As an alternative, Ms. Frazier recommends a route variation, depicted in figure 4, which deviates from the proposed route to the south past Road 36 and then proceeds westerly to join the Pipeline Project's proposed route.

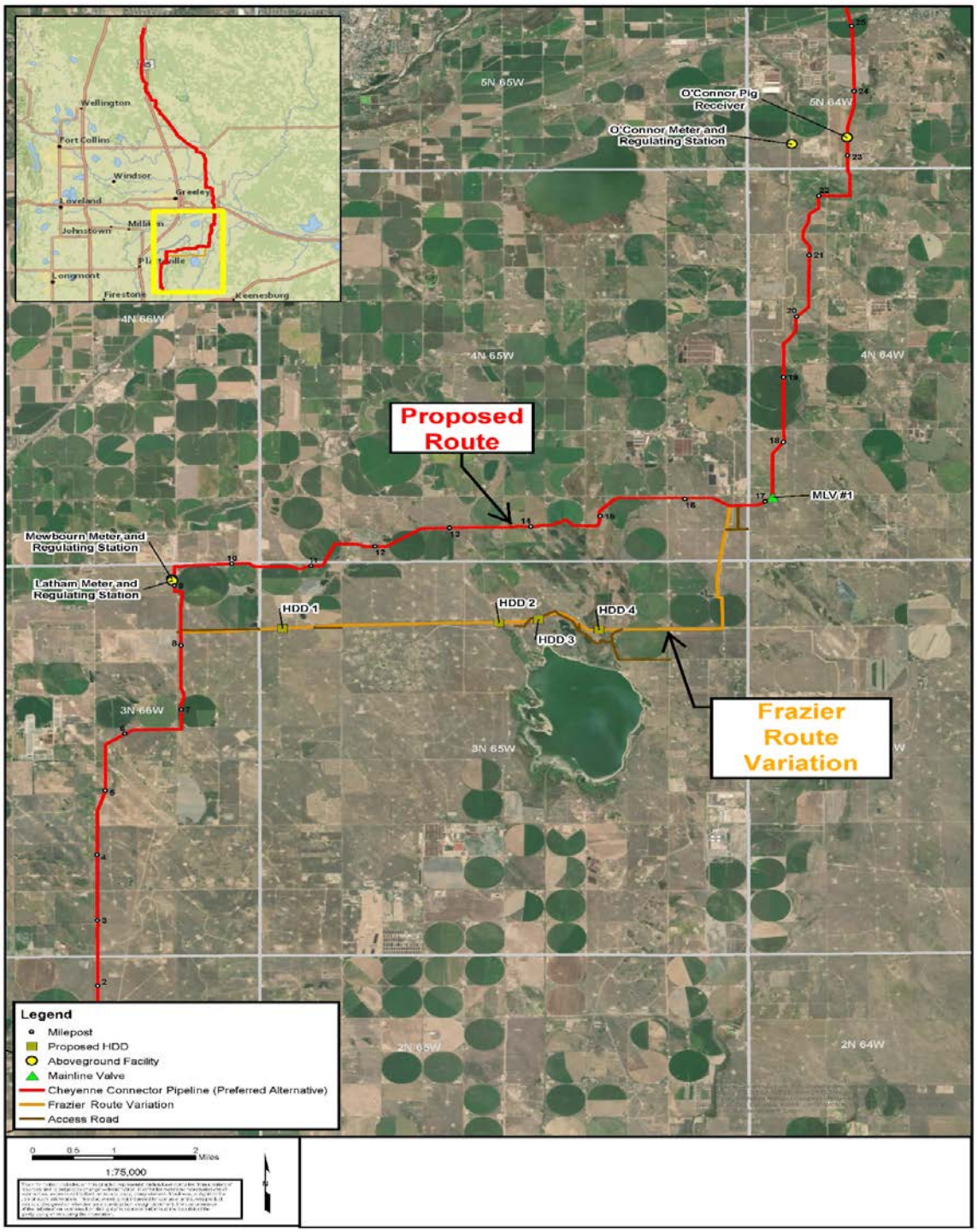

Figure 4: Frazier Route Variation

In table 36 below, we compare estimated resource impacts for the segment of Pipeline Project that would be replaced by Ms. Frazier's requested route variation.

Table 36
Comparison of Frazier Proposed Route Variation and Pipeline Project

Criterion	Frazier Route Variation	Corresponding Segment of Proposed Route
Length of pipe (miles)	8.72	8.61
Length of lateral pipeline required to serve the Mewbourn and Latham M&R Stations a/	~1.0	0
Area of disturbance required for construction right-of-way and lateral (acres) a/	91.1	70.8
Area of permanent right-of-way (acres) a/	52.8	52.1
Waterbody and wetland crossings (number) b/	11	11
HDD crossings (number) b/	4	4
Access roads (miles) b/	5.04	3.25
Agricultural land disturbed (acres) b/	41.1	94.2
State land disturbed (acres) b/	12.96	11.46
Federal land disturbed (acres) b/	0	0
Forest disturbed (acres) b/	0	0
Length of pipe paralleling existing rights-of-way (miles [percentage]) b/	1.36 (15.6)	0.19 (1.7)

a/ Impacts assume a 100-foot-wide construction right-of-way and 50-foot-wide permanent right-of-way.
b/ Impacts associated with the additional lateral pipeline are not included in these totals.

Based on the comparison of environmental impact criteria summarized in table 36 above, the two routes are generally comparable with regard to overall footprint (construction and operational acreages) and for the environmental resources affected. The Frazier Route Variation does have more co-location with existing rights-of-way and considerably fewer impacts on agricultural land. The Frazier Route Variation's comparatively lesser impact on agricultural land is partly due to its avoidance of the irrigated fields seen in figure 4 directly east of the proposed locations of the Latham and Mewbourn M&R Stations, and by the route maintaining a westerly direction and connecting with the proposed Pipeline Project's route as depicted in the figure. The Latham and Mewbourn M&R Stations would need to be sited at the western point of the interconnection where the Frazier Route Variation meets the remainder of the Pipeline Project's proposed route. Thus, the Frazier Route Variation would require an approximately 1-mile-long lateral pipeline connecting the Latham and Mewbourn M&R Stations to the respective gas processing plants each would serve.

The major drawback of the Frazier Route Variation is that it moves the route (and thus, impacts) onto landowners that may not have been involved in our scoping process. In section B of this EA we have determined that the environmental impacts associated

with the Pipeline Project, including impacts on agricultural land and irrigation systems, would not be not significant. Plus, we have recommended that Cheyenne Connector develop and implement an Agricultural Impact Mitigation Plan to further reduce impacts. We generally do not recommend alternatives that merely shift impacts from one set of landowners to another without there being a considerable environmental advantage to doing so, which is not the case here. However, we encourage Cheyenne Connector to work with Ms. Frazier to determine if it is possible to develop a route variation entirely within her property that addresses the concerns she notes in her comments.

4. Compressor Station Design Alternative

Although the proposed site for the Cheyenne Hub Booster Compressor Station is in an "attainment" area for all criteria pollutants, the site is adjacent to a non-attainment area. Due to the large amount of ongoing development in Weld County, we evaluated the feasibility for the new compressor station to be driven by electric motors rather than natural gas, thus reducing some emissions. According to information received from Rockies Express, six electric motor-driven units, each approximately 5,350 rated horsepower in size, could serve as alternatives to the currently proposed natural gas-fired engines. The electric motor-driven units would require that additional electric transmission infrastructure capable of providing a 30 megawatt load to the station be constructed. According to Rockies Express, such infrastructure would include, at a minimum, a several mile extension of the closest three-phase 69 kilovolt electric transmission system. Extending this system would require the acquisition of rights-of-way across multiple parcels affecting multiple landowners, the installation of utilization equipment including a medium voltage substation and six medium voltage variable frequency drive buildings. Construction of this additional infrastructure would result in greater impacts on most environmental resources compared to Rockies Express' proposal to power the compressors with natural gas. Therefore, we conclude that an electric motor-driven compression alternative does not present a significant environmental advantage over Rockies Express' proposed Enhancement Project and we do not recommend it.

D. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if the Applicants construct and operate the proposed facilities in accordance with their applications and supplements, and the staff's recommended mitigation measures below, approval of the Projects would not constitute a major action significantly affecting the quality of the human environment. If the Commission approves the Projects, we recommend that the Commission Order contain a finding of no significant impact and include the measures listed below as conditions in any authorization the Commission may issue to the Applicants.

1. Cheyenne Connector and Rockies Express shall follow the construction procedures and mitigation measures described in their applications and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Cheyenne Connector and Rockies Express 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 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 environmental resources during construction and operation of the projects. 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 each project's construction and operation.

3. **Prior to any construction**, Cheyenne Connector and Rockies Express shall each file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's 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**, Cheyenne Connector and Rockies Express 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.

   Cheyenne Connector and Rockies Express' 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. Cheyenne Connector and Rockies Express' right of eminent domain granted under NGA section 7(h) does not authorize them to increase the size of their natural gas pipeline or facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Cheyenne Connector and Rockies Express 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 workspace allowed by the Commission's *Upland Erosion Control, Revegetation, and Maintenance Plan* and/or minor field realignments per landowner needs and requirements which 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**, Cheyenne Connector and Rockies Express shall each file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Cheyenne Connector and Rockies Express must file revisions to the plan as schedules change. The plan shall identify:

a. how Cheyenne Connector and Rockies Express will 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 Cheyenne Connector and Rockies Express will 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 per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
e. the location and dates of the environmental compliance training and instructions Cheyenne Connector and Rockies Express will give to all personnel involved with construction and restoration (initial and refresher training as the projects progress and personnel change), with the opportunity for OEP staff to participate in the training session(s);
f. the company personnel (if known) and specific portion of Cheyenne Connector and Rockies Express' organizations having responsibility for compliance;
g. the procedures (including use of contract penalties) Cheyenne Connector and Rockies Express will follow if noncompliance occurs; and
h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

(1) the completion of all required surveys and reports;
(2) the environmental compliance training of onsite personnel;
(3) the start of construction; and
(4) the start and completion of restoration.

7. Cheyenne Connector shall employ at least one EI per construction spread. Rockies Express shall employ at least one EI for the project. The EIs 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, Cheyenne Connector and Rockies Express 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 will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. an update on Cheyenne Connector and Rockies Express' efforts to obtain the necessary federal authorizations;
b. the construction status of each spread, work planned for the following reporting period, and any schedule changes for stream crossings or work in other 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;
e. the effectiveness of all corrective actions implemented;
f. a description of any landowner/resident complaints which 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 Cheyenne Connector and Rockies Express from other federal, state, or local permitting agencies concerning instances of noncompliance, and Cheyenne Connector and Rockies Express' response.

9. Cheyenne Connector shall develop and implement an environmental complaint resolution procedure, and file such procedure with the Secretary, for review and approval by the Director of OEP. The procedure shall provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Cheyenne Connector Pipeline Project and restoration of the right-of-way. **Prior to construction**, Cheyenne Connector shall mail the complaint procedures to each landowner whose property will be crossed by the Pipeline Project.

a. In its letter to affected landowners, Cheyenne Connector shall:

(1) provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon a landowner should expect a response;
(2) instruct the landowners that if they are not satisfied with the response, they should call Cheyenne Connector's Hotline; the letter should indicate how soon to expect a response; and
(3) instruct the landowners that if they are still not satisfied with the response from Cheyenne Connector's Hotline, they should contact the Commission's Landowner Helpline at 877-337-2237 or at LandownerHelp@ferc.gov.

b. In addition, Cheyenne Connector shall include in its biweekly status report a copy of a table that contains the following information for each problem/concern:

(1) the identity of the caller and date of the call;
(2) the location by milepost and identification number from the authorized alignment sheet(s) of the affected property;
(3) a description of the problem/concern; and
(4) an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

10. Cheyenne Connector and Rockies Express must receive written authorization from the Director of OEP **before commencing construction of any project facilities.** To obtain such authorization, Cheyenne Connector and Rockies Express must file with the Secretary documentation

that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

11. Cheyenne Connector and Rockies Express must receive written authorization from the Director of OEP **before placing the projects into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by each project are proceeding satisfactorily.

12. **Within 30 days of placing the authorized facilities in service**, Cheyenne Connector and Rockies Express 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 will be consistent with all applicable conditions; or
    b. identifying which of the conditions in the Order Cheyenne Connector and Rockies Express has complied with or will comply with. This statement shall also identify any areas affected by the projects where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

13. **Prior to construction**, Cheyenne Connector shall file an updated table of all proposed road, railroad, and canal crossings by milepost for the Pipeline Project.

14. **Prior to construction**, Cheyenne Connector shall file with the Secretary copies of all geotechnical investigation results from the relocated and/or additional HDD locations (i.e., HDD #4R, HDD #11, and HDD #13A) including boring locations, lithologic logs, standard penetration tests, and bedrock quality designations. Cheyenne Connector shall also file an updated Trenchless Risk Analysis, for review and written approval by the Director of OEP, which shall include a description of:

    a. the likelihood of success for each drill;

    b. any subsurface conditions that were identified as a result of geotechnical investigations that may increase the risk of HDD complications (e.g., unplanned inadvertent returns, drill hole collapse, contamination). Quantify the potential for hydraulic fracture and an inadvertent release using the USACE's Delft method (or an equivalent method) for crossings through unconsolidated material, and/or a qualitative analysis for crossing through bedrock utilizing rock quality designation values obtained from bedrock cores; and

c. include the measures that will be implemented to minimize the risk of HDD complications.

15. Cheyenne Connector **shall not begin construction activities until:**

a. any outstanding or additionally required biological surveys for the Colorado butterfly plant and/or the Ute ladies'-tresses are completed and the results filed with the Secretary;
b. the FERC staff completes any necessary ESA section 7 consultation with the USFWS; and
c. Cheyenne Connector has received written notification from the Director of OEP that construction and/or use of mitigation (including implementation of conservation measures) may begin.

16. **Prior to construction**, Cheyenne Connector shall file with the Secretary the final Migratory Bird Conservation Plan developed in consultation with the USFWS, along with any comments on the plan provided by the USFWS.

17. **Prior to commencing HDD construction**, Cheyenne Connector shall file with the Secretary, for review and written approval by the Director of OEP, a list of any additional drilling fluid additives that could be used, as well as the Safety Data Sheets for each additive, and an affirmative statement that Cheyenne Connector will utilize only pre-approved, non-petrochemical-based, non-hazardous additives that comply with permit requirements and environmental regulations.

18. **Prior to construction,** Cheyenne Connector shall file with the Secretary, for review and written approval of the Director of OEP, an Agricultural Impact Mitigation Plan in consultation with the Platte Valley and West Greeley Conservation Districts that identifies the measures to be used by Cheyenne Connector to avoid damage to agricultural resources, compensate landowners for damage to crops or lost production, and to monitor the success of the mitigation. The Plan shall address issues such as depth of cover; restoration measures, including decompaction; timing of construction during crop seasons; and identification, repair, and monitoring of drain tile/irrigation systems.

19. Cheyenne Connector shall **not begin construction** of Pipeline Project facilities and/or use of staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

a. Cheyenne Connector files with the Secretary:

(1) an addendum survey report for the outstanding survey areas, and the SHPO's comments on the addendum report;

(2) any required avoidance/treatment plan, and the SHPO's comments on any plan;

b. the ACHP is afforded an opportunity to comment if historic properties would be adversely affected; and

c. FERC staff reviews and the Director of the OEP approves the cultural resources reports and plans, and notifies Cheyenne Connector in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.

All materials filed with the Commission containing **location, character, and ownership information** about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CUI//PRIV - DO NOT RELEASE."**

20. **Prior to construction of HDD numbers 6, 7, 9, 11, 12, 13, 15, and 18 entry sites and HDD numbers 12, 14, and 18 exit sites**, Cheyenne Connector shall file with the Secretary, for the review and written approval by the Director of OEP, a site-specific HDD noise mitigation plan for each listed HDD entry and exit site to reduce the projected noise level attributable to the proposed drilling operations. During drilling operations, Cheyenne Connector shall implement the approved plan, monitor noise levels, include the noise levels in the biweekly construction status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA at the NSAs.

21. **Prior to construction of HDD #13A and modified HDDs #1, 4R, 8, and 14**, Cheyenne Connector shall file with the Secretary an HDD noise analysis identifying the existing and projected noise levels at each NSA within 0.5 mile of each HDD entry and exit site. If noise attributable to the HDD is projected to exceed an L_{dn} of 55 dBA at any NSA, Cheyenne Connector shall file with the noise analysis a mitigation plan to reduce the projected noise levels to below an L_{dn} of 55 dBA at any NSA for the review and written approval by the Director of OEP. During drilling operations, Cheyenne Connector shall implement the approved plan, monitor noise levels, include the noise levels in the biweekly construction status reports, and make all reasonable efforts to restrict the noise attributable to the drilling operations to no more than an L_{dn} of 55 dBA at the NSAs.

22. Rockies Express shall file with the Secretary a noise survey for the Cheyenne Hub Booster Compressor Station **no later than 60 days** after placing all of the equipment at the modified Cheyenne Hub into service. If a full power load condition noise survey is not possible, Rockies Express shall file an interim survey

at the maximum possible power load **within 60 days** of placing the station into service and file the full power load survey **within 6 months**. If the noise attributable to operation of all equipment at the modified Cheyenne Hub under interim or full power load conditions exceeds an L_{dn} of 55 dBA at any nearby NSA, Rockies Express shall:

a. file a report with the Secretary, for review and written approval by the Director of OEP, on what changes are needed;

b. install additional noise controls to meet that level **within 1 year** of the in-service date; and

c. confirm compliance with this requirement by filing a second full power load noise survey with the Secretary for review and written approval by the Director of OEP **no later than 60 days** after it installs the additional noise controls.

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APPENDIX A

Permits, Approvals, and Consultations

Table A-1 Consultations, Permits, and Approvals for the Cheyenne Connector Pipeline Project		
Permit/Approval	**Administering Agency**	**Status**
Federal		
Certificate of Public Convenience and Necessity	Federal Energy Regulatory Commission	Application filed March 5, 2018. Certificate pending.
Clean Water Act, Section 404 —Nationwide Permit 12	U.S. Army Corps of Engineers – Omaha District	Courtesy notification sent February 2018 that Project would be constructed pursuant to Nationwide Permit 12.
Endangered Species Act, Section 7 Consultation	U.S. Fish and Wildlife Service Region 6 – Colorado	Consultation letters sent February 2018; amendment sent August 2018. Concurrence pending.
Tribal		
Tribal Consultation, National Historic Preservation Act Section 106	Apache Tribe of Oklahoma	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Cheyenne and Arapaho Tribes of Oklahoma	Contact letter sent February 21 2018. Follow-up June 26, 2018. Response received March 28, 2018.
	Cheyenne River Sioux Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Comanche Nation of Oklahoma	Contact letter sent February 21, 2018. Follow-up June 26, 2018. Responses received April 6, 2018 and May 9, 2018.
	Crow Creek Sioux Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Fort Sill Apache Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Kiowa Tribe of Oklahoma	Contact letter sent February 21, 2018. Follow-up June 26, 2018. Response received March 15, 2018.
	Northern Arapaho Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Northern Cheyenne Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. Response received March 23, 2018 and April 16, 2018.
	Oglala Sioux Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Rosebud Sioux Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Southern Ute Indian Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. Response received April 20, 2018.
	Standing Rock Sioux Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Ute Indian Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.
	Ute Mountain Ute Tribe	Contact letter sent February 21, 2018. Follow-up June 26, 2018. No response received.

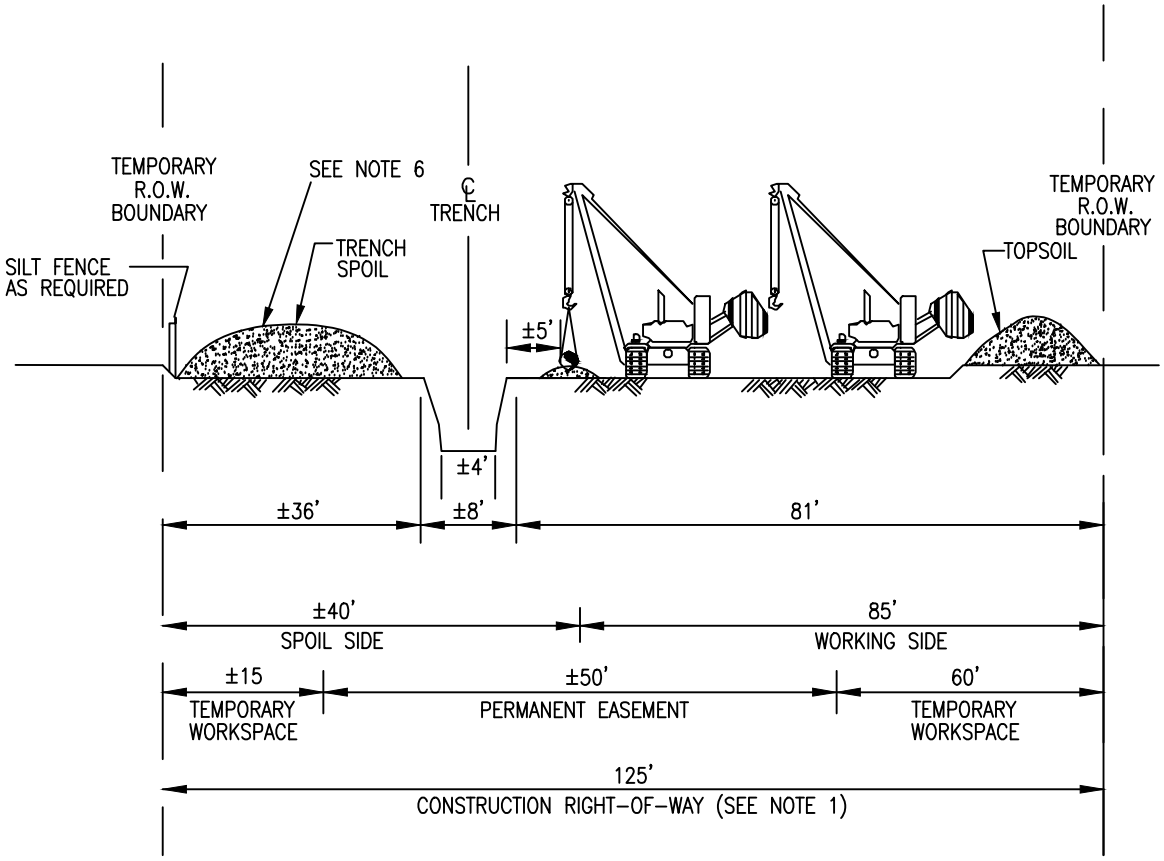
Table A-1 Consultations, Permits, and Approvals for the Cheyenne Connector Pipeline Project		
Permit/Approval	**Administering Agency**	**Status**
State		
State Listed Species Consultation	Colorado Parks and Wildlife	Letter sent February 2018; amendment sent August 2018. Concurrence pending.
General Construction Permit – Land Development Projects, Permit No. GP03	Colorado Department of Public Health and Environment	Issued.
National Pollutant Discharge Elimination System Storm Water Permit, General Permit for Construction Storm Water Discharge	Colorado Department of Public Health and Environment	Anticipated submittal January 2019.
Hydrostatic Test Water Discharge Permit	Colorado Department of Public Health and Environment	Anticipated submittal January 2019.
Section 106 Cultural Resources Consultation	Colorado State Historic Preservation Office	Survey report sent February 2018. Concurrence and request for additional information received March 26, 2018. Revised report sent May 30, 2018; concurrence received June 21, 2018. Addendum 1 sent August 2018; concurrence on addendum 1 received August 30, 2018.
State Highway Access Permit	Colorado Department of Transportation	Anticipated submittal November 2018.
Utility/Special Use Permit	Colorado Department of Transportation	Anticipated submittal November 2018.
Local		
Use by Special Review	Weld County Department of Planning Services	Application sent June 2018; pending.
Flood Hazard Development Permit	Weld County Department of Planning Services	Anticipated submittal October 2018.
Grading Permit	Weld County Department of Planning Services	Anticipated submittal October 2018.
Oil and Gas Permit (building permit for meter skids)	Weld County Department of Planning Services	Anticipated submittal October 2018.
Right-of-Way Use Application	Weld County Public Works Department	Anticipated submittal October 2018.
Access Permit	Weld County Public Works Department	Anticipated submittal October 2018.
Private		
Railroad Crossing Agreement	Union Pacific Railroad	Initiated July 2018; pending.

Table A-2 Consultations, Permits, and Approvals for the Cheyenne Hub Enhancement Project		
Permit/Approval	**Administering Agency**	**Status**
Federal		
Certificate of Public Convenience and Necessity	Federal Energy Regulatory Commission	Application filed March 5, 2018. Certificate pending.
Clean Water Act, Section 404 —Nationwide Permit 12	U.S. Army Corps of Engineers – Omaha District	Courtesy notification sent February 2018 that Project would be constructed pursuant to Nationwide Permit 12.
Endangered Species Act, Section 7 Consultation	U.S. Fish and Wildlife Service Region 6 – Colorado	Consultation letters sent February 2018. Concurrence pending.
Tribal		
Tribal Consultation, National Historic Preservation Act Section 106	Apache Tribe of Oklahoma	Contact letter sent February 21, 2018. No response received.
	Cheyenne and Arapaho Tribes of Oklahoma	Contact letter sent February 21, 2018. No response received.
	Cheyenne River Sioux Tribe	
	Comanche Nation of Oklahoma	Contact letter sent February 21, 2018. No response received.
	Crow Creek Sioux Tribe	Contact letter sent February 21, 2018. No response received.
	Fort Sill Apache Tribe	Contact letter sent February 21, 2018. No response received.
	Kiowa Tribe of Oklahoma	Contact letter sent February 21, 2018. No response received.
	Northern Arapaho Tribe	Contact letter sent February 21, 2018. No response received.
	Northern Cheyenne Tribe	Contact letter sent February 21, 2018. Response received March 23, 2018.
	Oglala Sioux Tribe	Contact letter sent February 21, 2018. No response received.
	Rosebud Sioux Tribe	Contact letter sent February 21, 2018. No response received.
	Southern Ute Indian Tribe	Contact letter sent February 21, 2018. No response received.
	Standing Rock Sioux Tribe	Contact letter sent February 21, 2018. No response received.
	Ute Indian Tribe	Contact letter sent February 21, 2018. No response received.
	Ute Mountain Ute Tribe	Contact letter sent February 21, 2018. No response received.
State		
State Listed Species Consultation	Colorado Parks and Wildlife	Letter sent February 2018. Concurrence pending.
Construction Permit	Colorado Department of Public Health and Environment – Air Pollution Control Division	Permit application filed January 2018. Permit issued June 19, 2018.
Title V Operating Permit	Colorado Department of Public Health and Environment – Air Pollution Control Division	Pending.
General Construction Permit – Land Development Projects, Permit No. GP03	Colorado Department of Public Health and Environment	Pending.
Colorado Discharge Permit System – Stormwater Discharge Associated with Construction Activities	Colorado Department of Public Health and Environment – Water Quality Control Division	Pending.
Colorado Discharge Permit System – Hydrostatic Testing of Pipelines,	Colorado Department of Public Health and Environment –	Pending.

Table A-2 Consultations, Permits, and Approvals for the Cheyenne Hub Enhancement Project		
Permit/Approval	**Administering Agency**	**Status**
Tanks, and Similar Vessels	Water Quality Control Division	
Section 106 Cultural Resources Consultation	Colorado State Historic Preservation Office	Survey report sent February 2018. Concurrence received March 16, 2018.
Local		
Use by Special Review	Weld County Department of Planning Services	Application sent June 2018; pending.
Grading Permit	Weld County Department of Planning Services	Anticipated submittal October 2018.
Oil and Gas Permit (building permit for meter skids)	Weld County Department of Planning Services	Anticipated submittal October 2018.

APPENDIX B

Typical Construction Cross-Section Diagrams



TYPICAL PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 75 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
2. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S REPRESENTATIVE. KEEP TOPSOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
3. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH TOPSOIL INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING.
4. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL AND TOPSOIL PILES.
5. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING INORDINATELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
6. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S REPRESENTATIVE, BE REVERSED.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHKD.	APPR
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TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
FULL ROW TOPSOIL SEGREGATION
FIGURE 1-3

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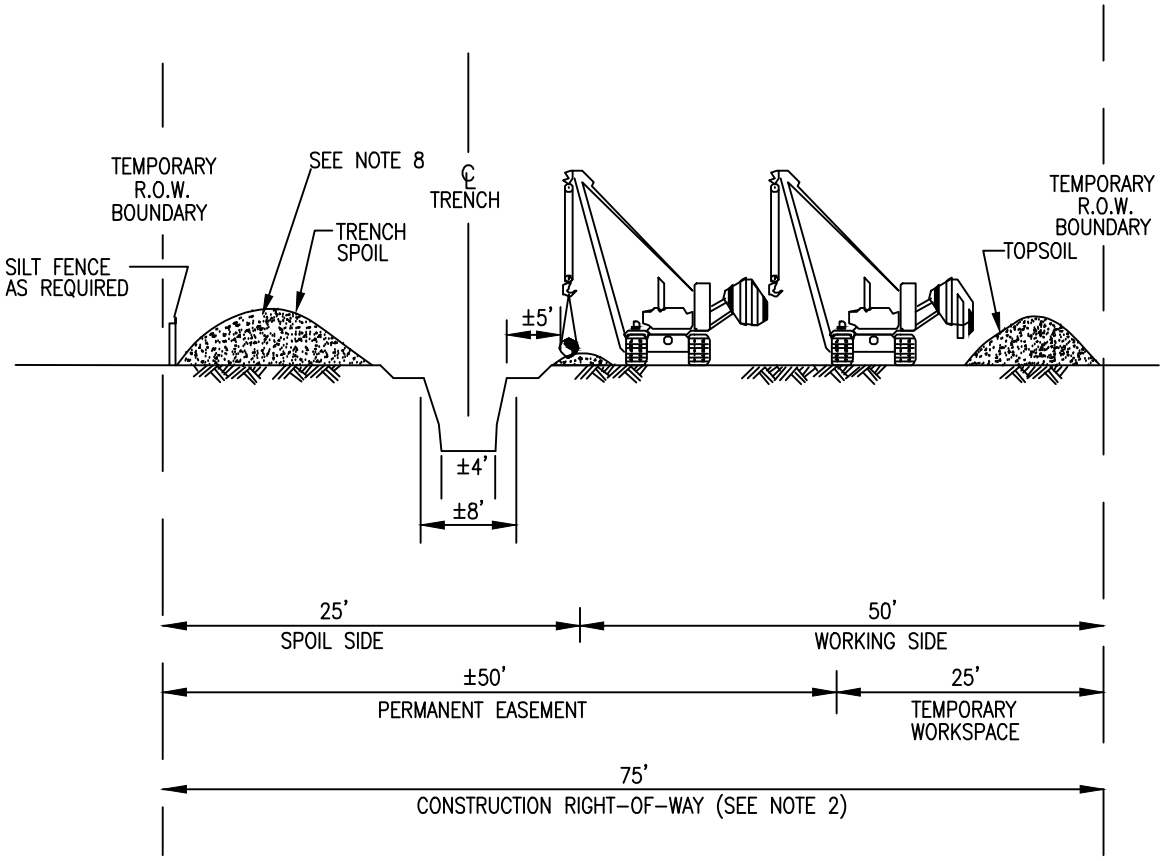

TYPICAL PROFILE

NOTES:

1. UTILIZE THE "TRENCH ONLY" TOPSOIL SALVAGE METHOD AT LOCATIONS SUCH AS RIPARIAN AREAS, WATERBODIES AND WETLANDS, OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 75 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 25 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
3. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S REPRESENTATIVE. KEEP TOPSOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
4. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH TOPSOIL INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING.
5. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL AND TOPSOIL PILES.
6. SAME LAYOUT APPLIES WHERE CONSTRUCTION R.O.W. DOES NOT ABUT EXISTING R.O.W.
7. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING INORDINATELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
8. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S REPRESENTATIVE, BE REVERSED.

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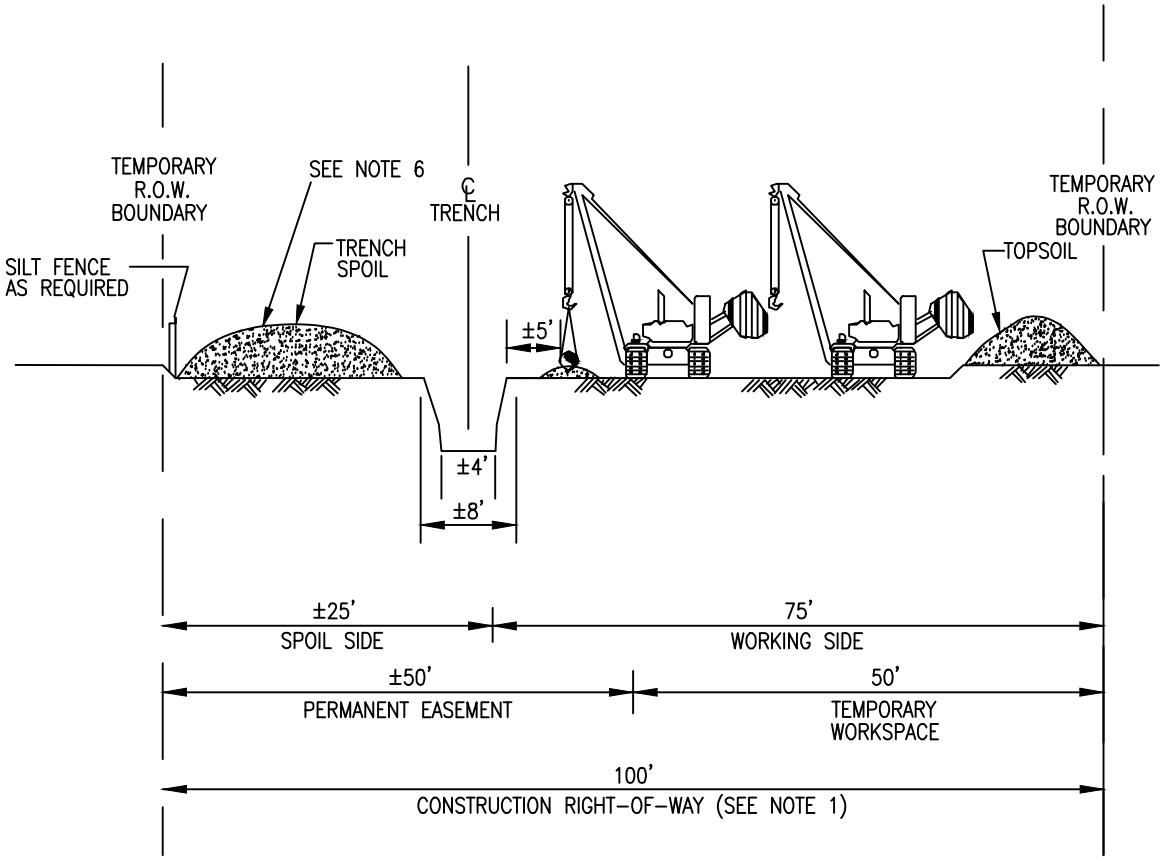
TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
WATERBODY & WETLAND (DITCH LINE ONLY)
FIGURE 1-3

DATE: 01/05/18		APPROVED BY:
SCALE: N.T.S.	CST-P-1260-A260	SH. 2 OF 4



TYPICAL PROFILE

NOTES:

1. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 100 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 50 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
2. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S REPRESENTATIVE. KEEP TOPSOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
3. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH TOPSOIL INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING.
4. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING SPOIL AND TOPSOIL PILES.
5. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING INORDINATELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
6. TOPSOIL AND TRENCH SPOIL RELATIVE POSITIONS CAN, AS DIRECTED BY THE COMPANY'S REPRESENTATIVE, BE REVERSED.

REVISIONS

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TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
O'CONNOR FULL ROW TOPSOIL SEGREGATION
FIGURE 1-3

DATE: 01/05/18		APPROVED BY:
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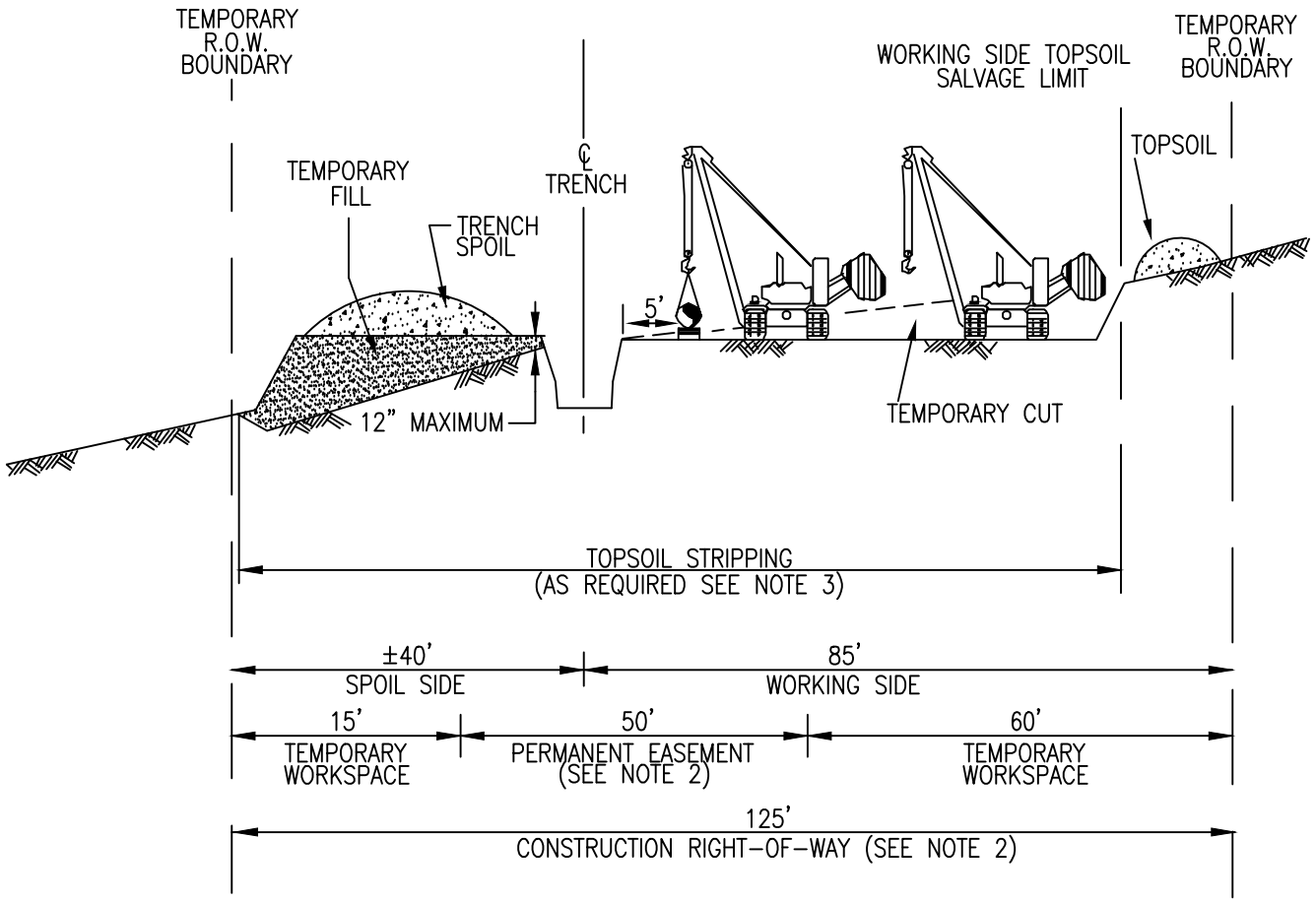

PROFILE

NOTES:

1. SIDE HILL CONSTRUCTION CUT AND FILL SHALL BE ALLOWED WHENEVER, IN THE OPINION OF THE CONTRACTOR, STEEP SIDE HILL CONSTRUCTION IS WARRANTED FOR PERSONNEL AND/OR EQUIPMENT SAFETY CONSIDERATIONS.
2. CONSTRUCTION RIGHT-OF-WAY WILL TYPICALLY BE 125 FEET WIDE CONSISTING OF 50 FEET OF PERMANENT EASEMENT AND 75 FEET OF TEMPORARY WORKSPACE. EXTRA TEMPORARY WORK SPACE WILL BE NECESSARY AT MAJOR ROAD, RAIL AND RIVER CROSSINGS AND OTHER SPECIAL CIRCUMSTANCES, AS REQUIRED. CERTAIN SITUATIONS MAY REQUIRE A NARROWER WIDTH.
3. THIS DRAWING REFLECTS "TRENCH, SPOIL, AND WORKING SIDE" TOPSOIL STRIPPING PROCEDURE AS NEEDED FOR HILL SIDE LEVELING. SALVAGE TOPSOIL OVER TRENCH UNDER THE SPOIL PILE AND FROM TEMPORARY CUT AND FILL AREAS AT LOCATIONS IDENTIFIED ON THE CONSTRUCTION ALIGNMENT SHEETS OR AS DIRECTED BY THE COMPANY'S REPRESENTATIVE.
4. STOCKPILE TOPSOIL AS SHOWN OR IN ANY CONFIGURATION APPROVED BY THE COMPANY'S REPRESENTATIVE. KEEP TOPSOIL CLEAN OF ALL CONSTRUCTION DEBRIS.
5. LEAVE GAPS IN TOPSOIL AND SPOIL PILES AT OBVIOUS DRAINAGES. DO NOT PUSH TOPSOIL INTO CREEKS OR WETLANDS. DO NOT USE TOPSOIL FOR PADDING. AVOID SCALPING VEGETATED GROUND SURFACE WHEN BACKFILLING TOPSOIL PILE.
6. TEMPORARILY SUSPEND TOPSOIL HANDLING OPERATIONS DURING INORDINATELY WINDY CONDITIONS UNTIL MITIGATIVE MEASURES TO MINIMIZE WIND EROSION CAN BE IMPLEMENTED.
7. FOR STORM WATER RUNOFF CONTROL ON HILL/SLOPE CONSTRUCTION, SEE TEMPORARY EROSION AND SEDIMENTATION CONTROL PROCEDURES IN SECTION C1260 OF THE CONSTRUCTION STANDARDS.

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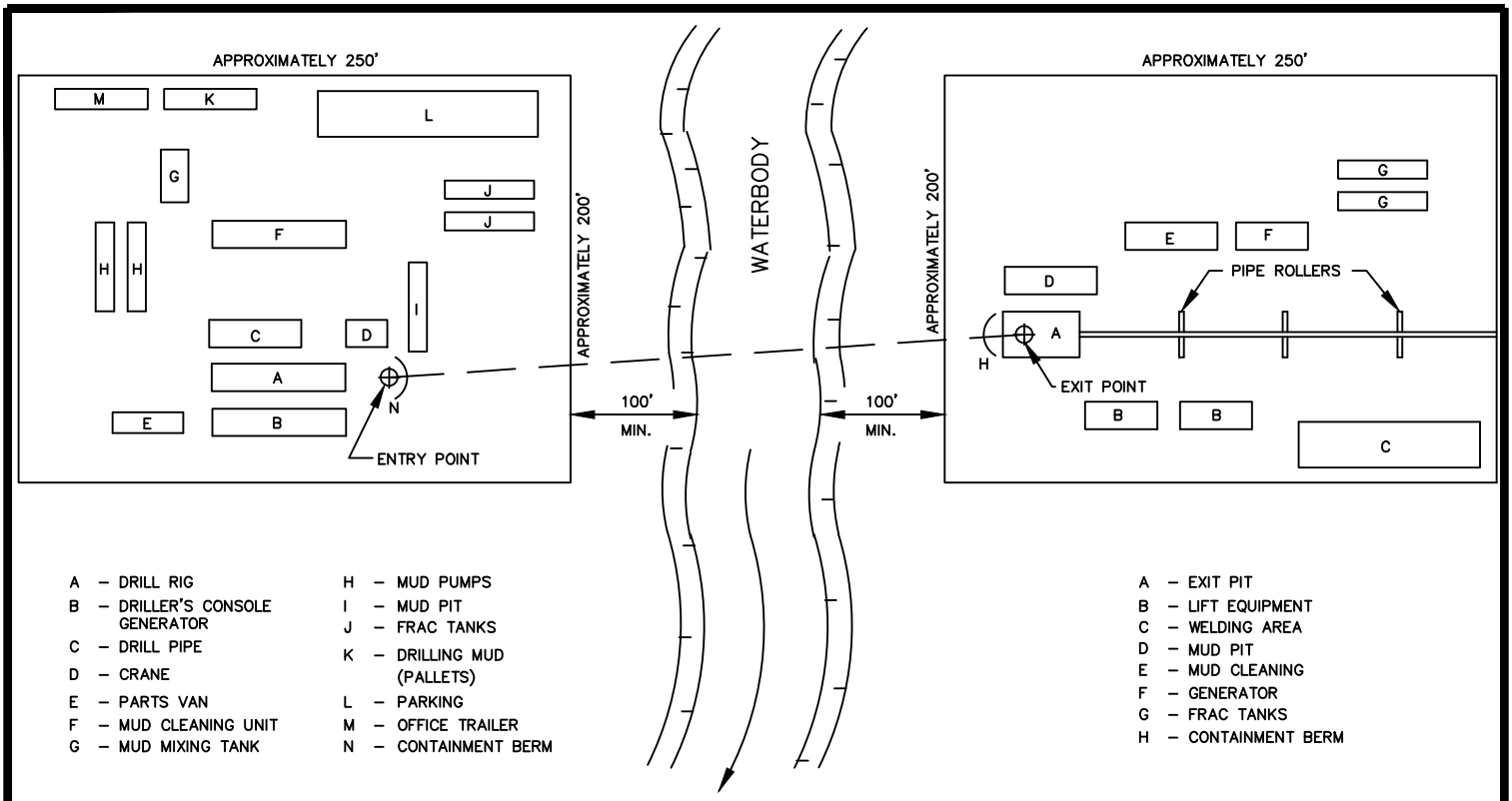
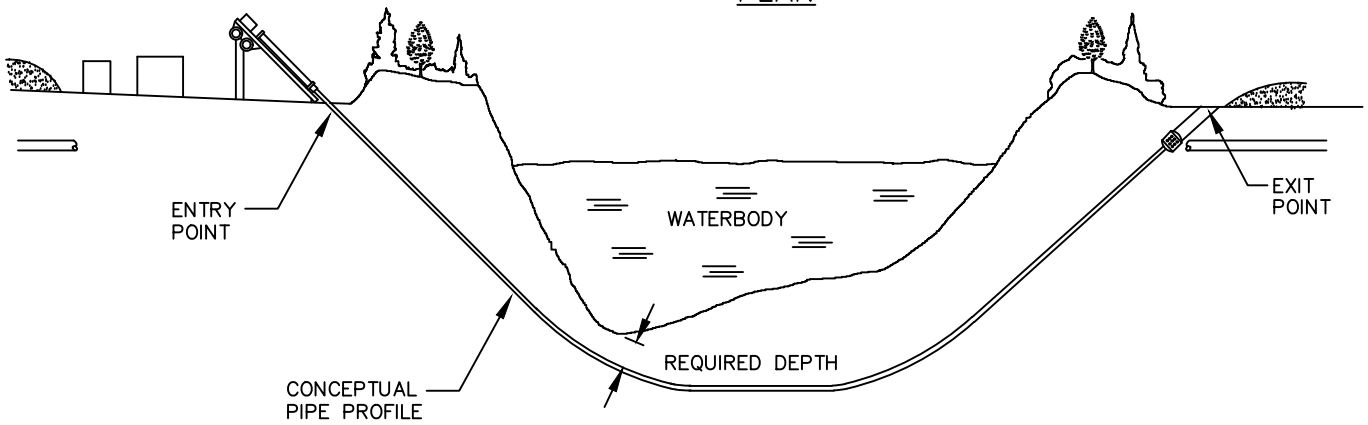
TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
TYPICAL SIDE HILL CONSTRUCTION
FIGURE 1-3

DATE: 01/05/18		APPROVED BY:
SCALE: N.T.S.	CST-P-1260-A250	SH. 4 OF 4



PLAN



PROFILE

NOTES:

1. SET UP DRILLING EQUIPMENT A MINIMUM OF 100 FEET FROM THE EDGE OF THE WATERCOURSE. DO NOT CLEAR OR GRADE WITHIN THE 100 FOOT ZONE.
2. ENSURE THAT ONLY BENTONITE BASED DRILLING MUD IS USED. DO NOT ALLOW THE USE OF ANY ADDITIVES TO THE DRILLING MUD WITHOUT THE APPROVAL OF COMPANY'S INSPECTOR.
3. INSTALL SUITABLE DRILLING MUD TANKS OR SUMPS TO PREVENT CONTAMINATION OF WATERCOURSE.
4. INSTALL BERMS DOWNSLOPE FROM THE DRILL ENTRY AND ANTICIPATED EXIT POINTS TO CONTAIN ANY RELEASE OF DRILLING MUD.
5. DISPOSE OF DRILLING MUD IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AUTHORITY REQUIREMENTS.

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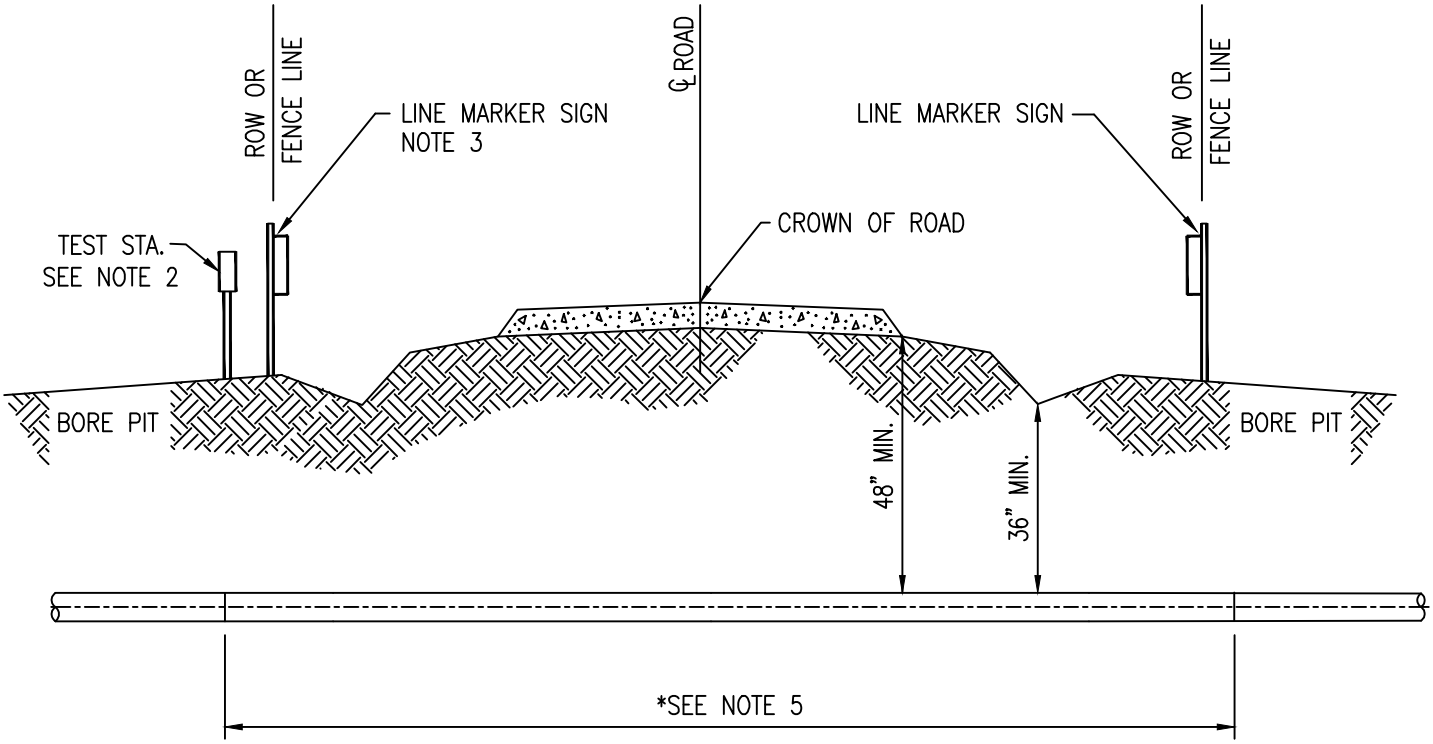
TALLGRASS ENERGY

CONNECTOR
HDD CROSSING TYPICAL
FIGURE 1-20

DATE: 01/05/18		APPROVED BY:
SCALE: N.T.S.	CST-P-1160-A365	SH. 1 OF 1



TYPICAL UNCASED BORED ROAD CROSSING

NOTES:

1. CARRIER PIPE IS TO BE COATED WITH APPROVED EXTERNAL PROTECTIVE COATING.
2. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED).
3. PIPELINE MARKER TO BE INSTALLED (IF REQUIRED).
4. PIPELINE MARKER & TEST STATIONS ON ROW LINE NEXT TO FENCE IF POSSIBLE.
5. CROSSING SHALL BE INSTALLED BY BORING.
6. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.

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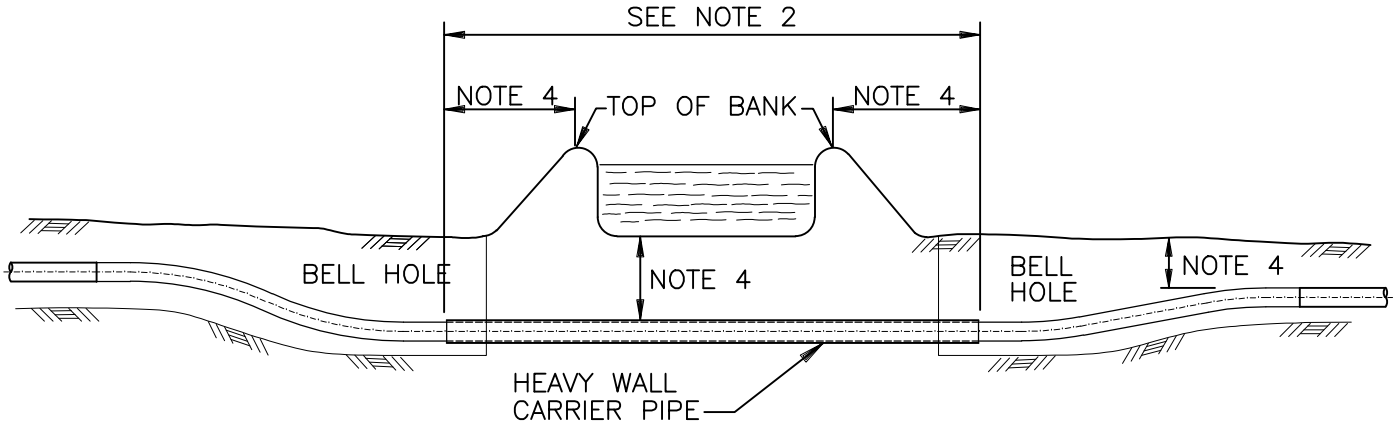
TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
BORE TYPICAL – ROAD
FIGURE 1-21

DATE: 01/05/18		APPROVED BY:
SCALE: N.T.S.	TYP-P-0100-A005	SH. 1 OF 1



ABOVE GROUND CANAL

NOTES:

1. CROSSING INSTALLATION SHALL BE IN ACCORDANCE WITH APPLICABLE PERMITS.
2. PIPE SHALL BE LEVEL UNDER CROSSING TO THE LENGTH AND DEPTH SHOWN ON ALIGNMENT SHEETS.
3. CONCRETE-LINED AND ABOVE-GROUND CANAL CROSSINGS SHALL BE INSTALLED BY BORING RIGHT-OF-WAY TO RIGHT-OF-WAY.
4. SEE ALIGNMENT SHEETS FOR EXACT DIMENSIONS.

REVISIONS

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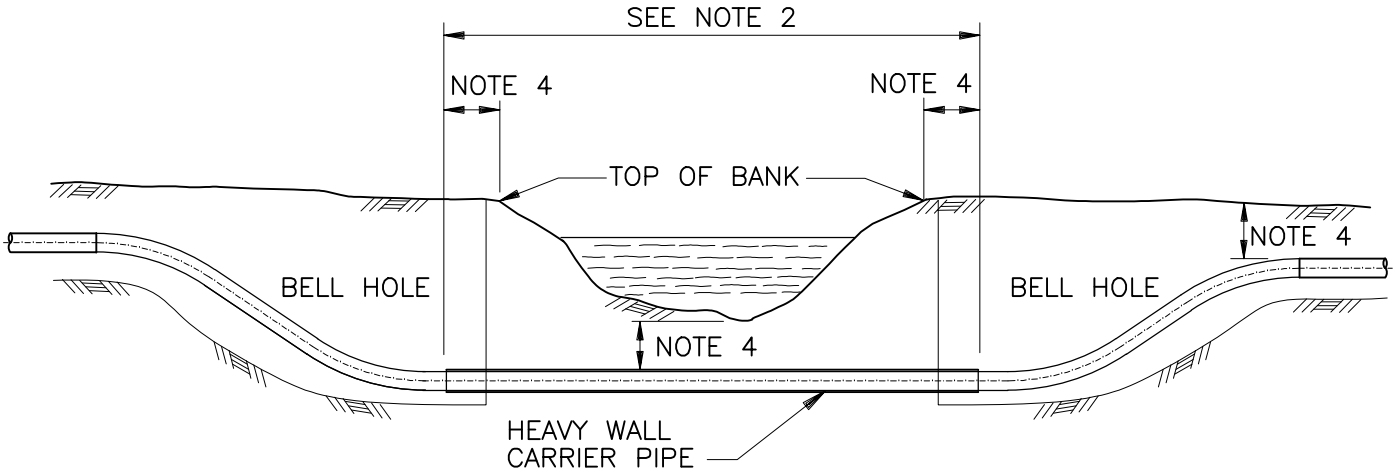
TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
BORE TYPICAL – CANAL
FIGURE 1-22 (1 OF 2)

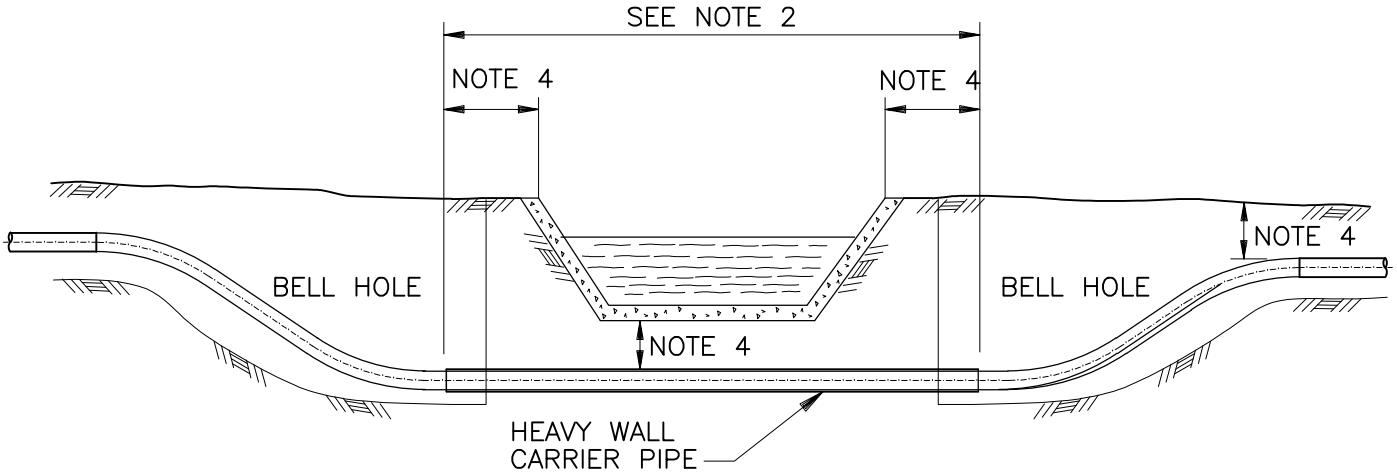
DATE: 01/05/18		APPROVED BY:
SCALE: N.T.S.		SH. 1 OF 2



BELOW GROUND LEVEL

HEAVY WALL

CANAL/STREAM



CONCRETE LINED

CANAL

NOTES:

1. CROSSING INSTALLATION SHALL BE IN ACCORDANCE WITH APPLICABLE PERMITS.
2. PIPE SHALL BE LEVEL UNDER CROSSING TO THE LENGTH AND DEPTH SHOWN ON ALIGNMENT SHEETS.
3. CONCRETE-LINED AND ABOVE-GROUND CANAL CROSSINGS SHALL BE INSTALLED BY BORING RIGHT-OF-WAY TO RIGHT-OF-WAY.
4. SEE ALIGNMENT SHEETS FOR EXACT DIMENSIONS.

REVISIONS

NO.	DATE	DESCRIPTION	BY	CHKD.	APPR
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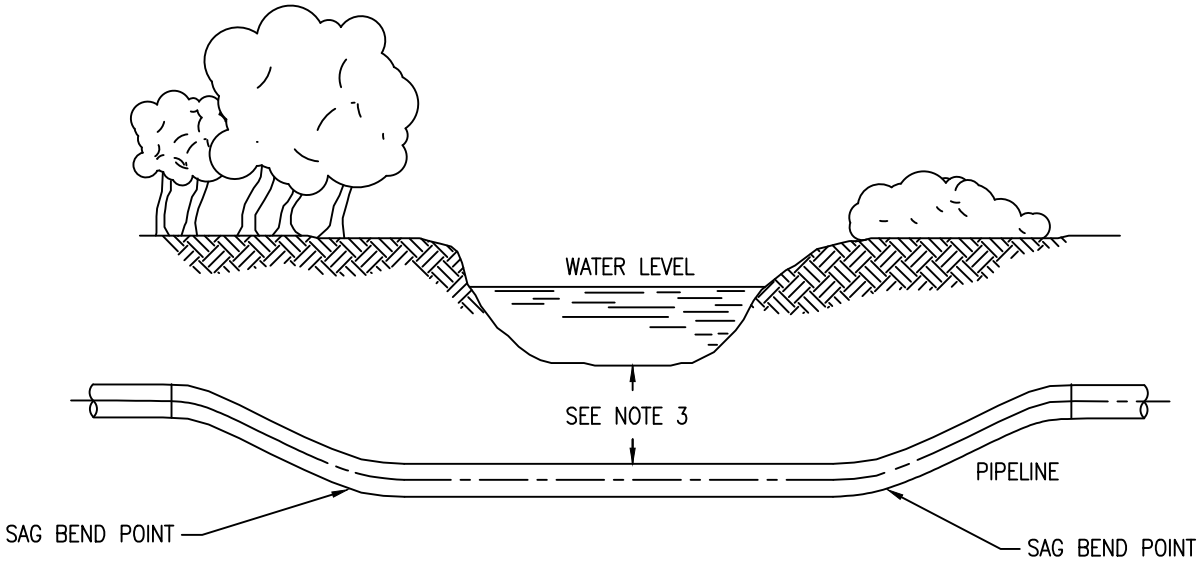
TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
BORE TYPICAL – CANAL
FIGURE 1-22 (2 OF 2)

DATE: 01/05/18		APPROVED BY:
SCALE: N.T.S.		SH. 2 OF 2



MINOR WATERWAY CROSSING

NOTES:

1. THIS DRAWING IS APPLICABLE TO ALL SMALL STREAM, DITCH, CANAL CROSSINGS NOT SHOWN
2. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.
3. FOR OPEN CUTS, NORMAL PIPE DEPTH TO BE A MINIMUM OF 48", BUT MAY BE DECREASED IF SOLID ROCK IS ENCOUNTERED. FOR BORES, NORMAL PIPE DEPTH TO BE A MINIMUM OF 120".
4. INSTALLATION OF EQUIPMENT BRIDGES AND EXCAVATION OF PIPE TRENCH SHALL COMPLY WITH ALL ENVIRONMENTAL PERMIT REQUIREMENTS AND REGULATIONS.

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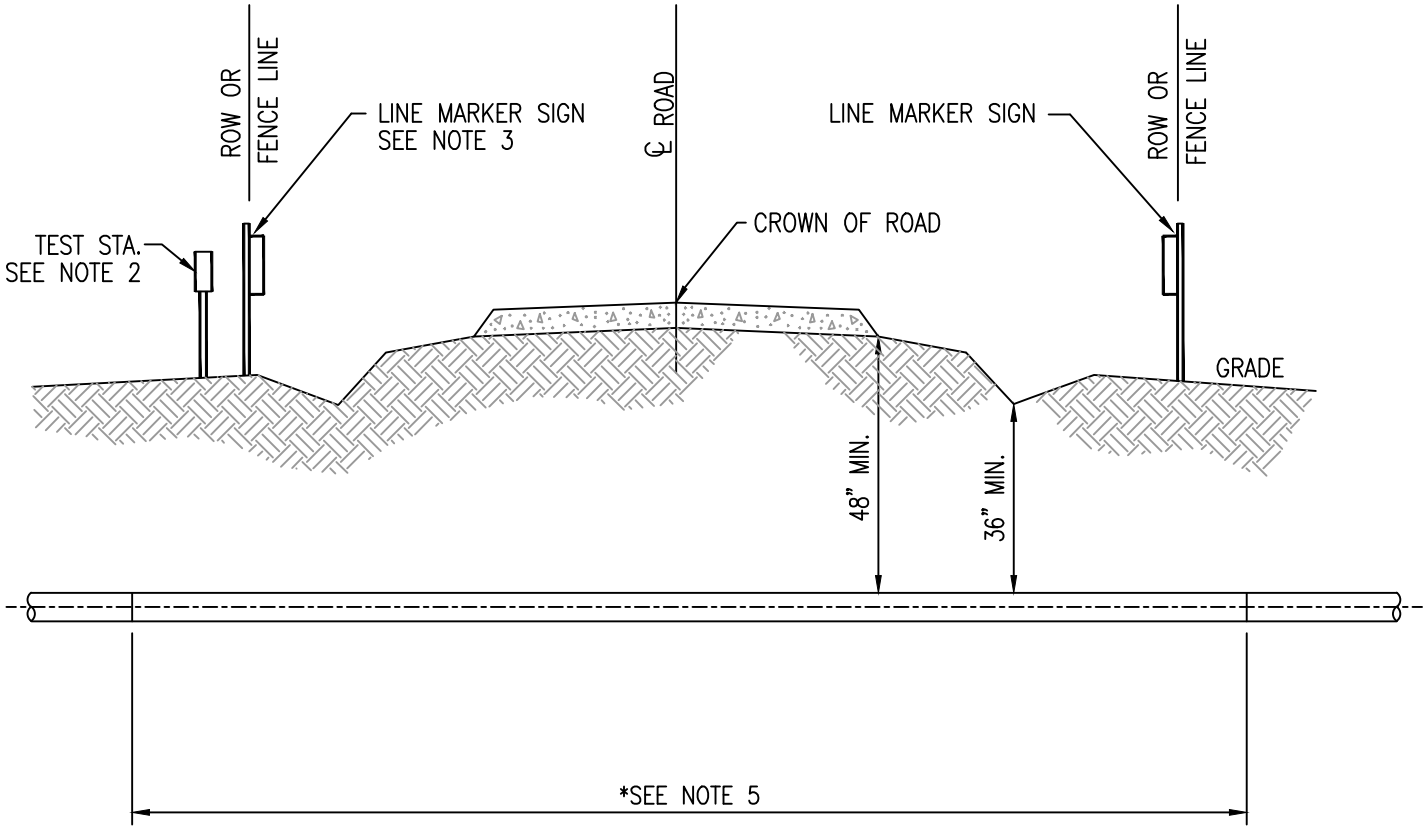
TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
TYPICAL MINOR WATERWAY CROSSING
FIGURE 1-23

DATE: 01/05/18		APPROVED BY:
SCALE: N.T.S.	TYP-P-0100-A041	SH. 1 OF 1



TYPICAL UNCASED OPEN CUT ROAD CROSSING

NOTES:

1. CARRIER PIPE IS TO BE COATED WITH APPROVED EXTERNAL PROTECTIVE COATING.
2. CATHODIC TEST STATION TO BE INSTALLED (IF REQUIRED).
3. PIPELINE MARKER TO BE INSTALLED (IF REQUIRED).
4. PIPELINE MARKER & TEST STATIONS ON ROW LINE NEXT TO FENCE IF POSSIBLE.
5. CROSSING SHALL BE INSTALLED BY OPEN CUTTING.
6. PIPE WALL THICKNESS AND GRADE SHALL BE AS SPECIFIED ON ALIGNMENT DRAWINGS.

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TALLGRASS ENERGY

CHEYENNE CONNECTOR PIPELINE
OPEN CUT TYPICAL – ROAD
FIGURE 1–24

DATE: 01/05/18		APPROVED BY:
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APPENDIX C

Additional Temporary Workspaces

ATWS Locations for the Cheyenne Connector Pipeline Project		
ATWS Name	**Milepost Start Location**	**Temporary Disturbance (acres)**
Test Break (TB)-1	14.3	5.83
TB-2	28.0	4.60
TB-3	28.9	4.72
TB-4	43.4	4.61
TB-5	43.8	26.24
TB-6	48.2	16.80
TB-7	54.8	4.60
TB-8	64.5	5.92
ATWS-001	0.0	1.57
ATWS-002	0.0	0.45
ATWS-003	0.1	0.34
ATWS-004	0.3	0.52
ATWS-005	0.7	0.34
ATWS-006	1.5	0.34
ATWS-007	2.4	0.34
ATWS-008	2.4	0.17
ATWS-009	2.4	0.34
ATWS-010	2.5	0.34
ATWS-011	2.6	0.34
ATWS-012	3.4	0.34
ATWS-013	3.5	0.34
ATWS-014	5.5	0.34
ATWS-015	5.7	0.34
ATWS-016	6.1	0.34
ATWS-017	6.6	0.34
ATWS-018	6.7	1.07
ATWS-019	6.8	0.34
ATWS-020	7.2	0.34
ATWS-021	7.3	0.34
ATWS-022	8.2	0.34
ATWS-023	8.5	0.34
ATWS-024	8.8	0.56
ATWS-025	8.9	0.26
ATWS-026	8.9	0.17
ATWS-027	8.9	0.43
ATWS-028	9.1	2.45
ATWS-028A	9.3	0.52
ATWS-029	9.4	0.62
ATWS-029A	0.0	0.33
ATWS-030	10.3	0.91
ATWS-031	10.4	0.34
ATWS-032	11.1	0.34
ATWS-033	11.2	0.34
ATWS-034	11.3	0.34
ATWS-035	11.5	0.34
ATWS-036	11.6	0.34
ATWS-037	11.6	0.34
ATWS-038	11.8	0.34
ATWS-039	11.9	0.37

ATWS Locations for the Cheyenne Connector Pipeline Project		
ATWS Name	**Milepost Start Location**	**Temporary Disturbance (acres)**
ATWS-040	12.1	0.34
ATWS-041	12.6	0.34
ATWS-042	12.7	0.70
ATWS-043A	13.0	1.28
ATWS-043R	13.0	0.69
ATWS-044	13.3	1.33
ATWS-045	13.6	0.98
ATWS-046	13.7	0.34
ATWS-047	13.8	0.64
ATWS-048	14.2	0.34
ATWS-049	14.2	0.65
ATWS-050	14.4	0.74
ATWS-051	14.6	0.93
ATWS-051A	14.6	0.23
ATWS-052	14.8	0.51
ATWS-053	14.8	0.75
ATWS-053A	14.9	1.34
ATWS-054R	14.9	0.38
ATWS-055R	15.7	0.21
ATWS-056R	16.1	0.86
ATWS-059R	16.8	0.77
ATWS-060	16.9	0.52
ATWS-061	16.9	0.52
ATWS-062	17.2	0.23
ATWS-063	17.2	0.72
ATWS-064	17.3	1.39
ATWS-064A	17.4	0.20
ATWS-065	17.4	0.69
ATWS-066	17.4	0.34
ATWS-067	18.0	0.34
ATWS-068	18.3	0.67
ATWS-069	18.4	0.34
ATWS-070	18.5	0.34
ATWS-071	19.4	0.34
ATWS-072	19.5	0.34
ATWS-073R	19.8	0.46
ATWS-074R	19.9	0.35
ATWS-075R	20.0	0.52
ATWS-076R	20.2	0.34
ATWS-077	20.4	0.34
ATWS-078	20.5	0.62
ATWS-079	20.7	0.69
ATWS-080	21.6	0.34
ATWS-081	21.6	0.36
ATWS-082	21.9	0.53
ATWS-083	22.0	0.34
ATWS-084	22.1	0.34
ATWS-085	22.2	0.52
ATWS-086	22.3	0.34
ATWS-087	22.4	0.34

ATWS Locations for the Cheyenne Connector Pipeline Project		
ATWS Name	**Milepost Start Location**	**Temporary Disturbance (acres)**
ATWS-088	22.6	0.52
ATWS-089	22.7	0.34
ATWS-090	23.0	0.71
ATWS-091	23.0	0.32
ATWS-092	23.1	0.34
WS-OCL-001R	O'Connor Lateral	0.17
WS-OCL-004R	O'Connor Lateral	2.02
ATWS-093	23.7	0.75
ATWS-094	23.7	0.47
ATWS-095	24.0	0.67
ATWS-096	24.2	0.58
ATWS-097	24.8	0.34
ATWS-098	25.0	0.34
ATWS-099	25.1	2.67
ATWS-100	25.1	0.46
ATWS-101	25.3	0.52
ATWS-102	25.3	0.52
ATWS-103	25.6	1.15
ATWS-104	25.6	1.00
ATWS-105	25.7	0.34
ATWS-106	26.0	0.34
ATWS-107	26.1	0.34
ATWS-108	26.2	0.34
ATWS-109	26.3	0.32
ATWS-110	26.6	0.34
ATWS-111	26.7	1.72
ATWS-112	26.9	0.91
ATWS-113	26.9	0.19
ATWS-114	27.2	0.67
ATWS-115	27.2	0.36
ATWS-116	27.2	0.23
ATWS-117	27.3	0.27
ATWS-118	27.4	0.65
ATWS-119	27.6	0.34
ATWS-120	27.8	0.39
ATWS-121	27.9	0.82
ATWS-122	28.1	4.40
ATWS-123	28.7	1.16
ATWS-124	28.7	0.96
ATWS-125	28.9	0.52
ATWS-126	28.9	0.91
ATWS-127	29.0	1.39
ATWS-128	29.1	0.34
ATWS-129	29.3	0.34
ATWS-129A	29.4	0.17
ATWS-130	29.8	0.34
ATWS-131	29.9	0.34
ATWS-132	30.3	0.34
ATWS-133	30.4	0.34
ATWS-134	30.6	0.64

ATWS Locations for the Cheyenne Connector Pipeline Project		
ATWS Name	**Milepost Start Location**	**Temporary Disturbance (acres)**
ATWS-135	30.7	0.34
ATWS-136	30.9	0.34
ATWS-137	31.0	0.34
ATWS-138	31.3	0.34
ATWS-139	31.3	0.34
ATWS-140	31.7	0.34
ATWS-141	31.7	0.34
ATWS-142	31.8	0.40
ATWS-143	32.2	0.87
ATWS-144	32.3	0.77
ATWS-145	32.8	0.34
ATWS-146	33.3	0.34
ATWS-147	33.3	0.31
ATWS-148	33.8	1.29
ATWS-149	34.1	0.57
ATWS-150	34.1	0.42
ATWS-151	34.3	0.94
ATWS-152	34.3	0.34
ATWS-153	34.3	0.44
ATWS-154	34.4	0.50
ATWS-154A	34.5	0.20
ATWS-154B	34.5	0.14
ATWS-154C	34.7	0.09
ATWS-155	35.1	0.69
ATWS-156	35.4	0.83
ATWS-158	35.4	0.34
ATWS-159	36.4	0.34
ATWS-160	36.4	0.34
ATWS-162	36.9	0.38
ATWS-163	37.0	0.26
ATWS-163A	37.0	0.30
ATWS-164	37.0	0.39
ATWS-165	37.3	0.77
ATWS-166	37.3	1.79
ATWS-167	37.5	0.83
ATWS-168	37.5	1.21
ATWS-169	37.7	0.26
ATWS-170	37.7	0.95
ATWS-171	38.0	0.56
ATWS-172	38.0	0.49
ATWS-172A	38.0	0.29
ATWS-173	38.9	0.38
ATWS-174	38.9	0.35
ATWS-175	39.7	0.43
ATWS-176	39.8	0.34
ATWS-177	39.8	0.52
ATWS-178	39.9	0.52
ATWS-179	40.3	0.34
ATWS-180	40.4	0.52
ATWS-181	41.0	0.42

ATWS Locations for the Cheyenne Connector Pipeline Project		
ATWS Name	**Milepost Start Location**	**Temporary Disturbance (acres)**
ATWS-182	41.0	2.31
ATWS-183	41.1	0.85
ATWS-184	41.3	1.18
ATWS-185	41.4	0.34
ATWS-186	41.5	0.35
ATWS-187	41.5	0.63
ATWS-188	41.6	0.56
ATWS-189	42.8	0.34
ATWS-190	42.8	0.34
ATWS-191	43.0	0.86
ATWS-192	43.1	0.84
ATWS-193	43.3	0.83
ATWS-194	43.3	0.22
ATWS-195	43.3	0.34
ATWS-196	43.5	0.34
ATWS-197	43.6	0.34
ATWS-198	44.7	0.34
ATWS-199	44.9	0.34
ATWS-200	44.9	0.34
ATWS-201	45.0	0.34
ATWS-202	45.3	0.34
ATWS-203	45.4	0.34
ATWS-204	45.6	0.34
ATWS-205	45.8	0.56
ATWS-206	45.8	0.26
ATWS-207	46.0	0.34
ATWS-208	46.1	0.53
ATWS-209	47.2	0.35
ATWS-210	47.3	0.35
ATWS-211	48.0	0.34
ATWS-212	48.0	0.34
ATWS-213	48.6	0.34
ATWS-214	48.7	0.34
ATWS-215	49.5	0.34
ATWS-216	49.5	0.34
ATWS-217	49.9	0.33
ATWS-218	49.9	0.35
ATWS-219	50.6	0.39
ATWS-220	50.6	0.30
ATWS-221	51.2	0.52
ATWS-222	51.5	0.52
ATWS-223	51.8	0.35
ATWS-224	51.9	0.27
ATWS-225R	53.0	0.21
ATWS-226R	53.0	0.17
ATWS-227A	53.4	0.23
ATWS-227R	53.1	0.22
ATWS-228	55.3	0.52
ATWS-229	54.7	0.34
ATWS-230	54.8	0.27

ATWS Locations for the Cheyenne Connector Pipeline Project		
ATWS Name	**Milepost Start Location**	**Temporary Disturbance (acres)**
ATWS-231	55.0	0.52
ATWS-232	55.8	0.34
ATWS-233	55.9	0.34
ATWS-234	56.9	1.00
ATWS-236	57.0	0.34
ATWS-237	58.1	0.34
ATWS-238	58.2	0.34
ATWS-239	58.3	0.34
ATWS-240	58.4	0.34
ATWS-241	58.5	0.34
ATWS-242	58.9	0.34
ATWS-243	59.2	0.34
ATWS-244	59.3	0.34
ATWS-245	60.7	0.57
ATWS-246	61.4	0.25
ATWS-247	61.4	0.25
ATWS-248	61.9	0.88
ATWS-249	62.4	0.34
ATWS-250	64.3	0.67
ATWS-251	64.4	0.34
ATWS-252	64.5	0.35
ATWS-253	67.5	0.34
ATWS-254	67.5	0.34
ATWS-255	68.1	1.15
ATWS-256	69.2	0.17
ATWS-257	69.5	0.09
ATWS-258	69.7	0.53
ATWS-259	70.1	1.20
ATWS-260	70.6	0.68
ATWS-261	71.0	1.90

APPENDIX D

Waterbodies Crossed by the Pipeline Project

Waterbodies Impacted by the Cheyenne Connector Pipeline Project						
Milepost	**Waterbody ID**	**Waterbody Name**	**Flow Regime**	**Width of Crossing (feet)**	**FERC Waterbody Type**	**Crossing Type**
2.6	WB001	Speer Canal	Ditch	12	Intermediate	Bore
10.0	WB002	Unnamed tributary	Intermittent	54	Intermediate	Open Cut
11.8	WB003	Speer Canal	Ditch	17	Intermediate	Bore
13.1	WB004	Platte Valley Canal	Intermittent	32	Intermediate	HDD
13.4	WB006	Evans Ditch	Intermittent	7	Minor	HDD
13.7	WB007	Unnamed ditch	Ditch	3	Minor	Bore
14.7	WB009	Unnamed tributary	Intermittent	9	Minor	HDD
15.1	WB011	Unnamed tributary	Intermittent	3	Minor	Within construction workspace
14.8	WB012	Unnamed ditch	Ditch	20	Intermediate	Within construction workspace
15.9	WB013	Gilmore Ditch	Ditch	23	Intermediate	HDD
19.9	WB014	Neres Canal	Ditch	7	Minor	Bore
20.6	WB018	Neres Canal	Ditch	16	Intermediate	HDD
21.9	WB019	Neres Canal	Ditch	34	Intermediate	Bore
23.8	WB021	Gilmore Ditch	Ditch	4	Minor	HDD
25.0	WB023	Unnamed ditch	Ditch	4	Minor	Bore
25.4	WB027	Latham Ditch	Intermittent	25	Intermediate	HDD
25.7	WB029	Unnamed tributary	Intermittent	4	Minor	Bore
26.0	WB031	Unnamed tributary	Intermittent	4	Minor	Bore
26.3	WB034	Unnamed tributary	Intermittent	17	Minor	Bore
26.3	WB035	Unnamed tributary	Intermittent	4	Minor	Bore
26.6	WB038	Unnamed tributary	Intermittent	39	Intermediate	Within Construction Workspace
27.1	WB039	Unnamed tributary	Intermittent	16	Intermediate	HDD
27.3	WB041	Plumb Ditch	Intermittent	4	Minor	Open Cut
27.7	WB042	Unnamed tributary	Intermittent	4	Minor	Open Cut
27.8	WB043	Unnamed tributary	Intermittent	106	Major	Open Cut
28.3	WB044	Unnamed tributary	Intermittent	306	Major	HDD
28.4	WB045	South Platte River[1]	Perennial	304	Minor	HDD
28.7	WB046	Ogilivy Ditch	Ditch	14	Minor	HDD

Waterbodies Impacted by the Cheyenne Connector Pipeline Project						
Milepost	**Waterbody ID**	**Waterbody Name**	**Flow Regime**	**Width of Crossing (feet)**	**FERC Waterbody Type**	**Crossing Type**
28.8	WB047	Unnamed ditch	Ditch	7	Minor	HDD
29.4	WB048	Unnamed tributary	Intermittent	3	Minor	Open Cut
29.9	WB049	Unnamed tributary	Intermittent	3	Minor	Bore
30.1	WB050	Unnamed tributary	Intermittent	4	Minor	Open Cut
31.0	WB055	Unnamed tributary	Intermittent	10	Minor	Bore
31.3	WB057	Unnamed tributary	Intermittent	15	Intermediate	Open Cut
31.3	WB058	Lone Tree Creek	Intermittent	4	Minor	Open Cut
31.5	WB060	Unnamed tributary	Intermittent	3	Minor	Open Cut
31.7	WB063	Unnamed tributary	Intermittent	4	Minor	Bore
31.7	WB064	Unnamed tributary	Intermittent	7	Minor	Bore
32.3	WB065	Unnamed tributary	Intermittent	3	Minor	Bore
32.3	WB066	Unnamed tributary	Intermittent	6	Minor	Bore
32.8	WB068	Unnamed tributary	Intermittent	3	Minor	Open Cut
33.3	WB069	Unnamed tributary	Intermittent	3	Minor	Bore
33.9	WB070	Unnamed tributary	Ephemeral	7	Minor	HDD
33.9	WB071	Lone Tree Creek	Intermittent	6	Minor	HDD
33.9	WB072	Unnamed tributary	Intermittent	2	Minor	HDD
34.1	WB073	Unnamed tributary	Ephemeral	4	Minor	Open Cut
34.4	WB074	Unnamed tributary	Intermittent	22	Intermediate	Bore
35.2	WB075	Greeley No. 2 Ditch	Intermittent	5	Minor	HDD
35.6	WB076	Unnamed ditch	Ditch	101	Major	located in Eaton Rail/Storage Yard
37.0	WB077	Unnamed tributary	Intermittent	3	Minor	Open Cut
37.4	WB078	Unnamed tributary	Perennial	48	Intermediate	HDD

Waterbodies Impacted by the Cheyenne Connector Pipeline Project						
Milepost	**Waterbody ID**	**Waterbody Name**	**Flow Regime**	**Width of Crossing (feet)**	**FERC Waterbody Type**	**Crossing Type**
37.4	WB079	Unnamed ditch	Ditch	43	Intermediate	HDD
37.9	WB083	Eaton Ditch	Intermittent	37	Intermediate	HDD
37.9	WB084	Unnamed ditch	Ditch	6	Minor	HDD
41.2	WB087	Eaton Ditch	Intermittent	3	Minor	HDD
41.4	WB088[1]	Owl Creek	Intermittent	3	Minor	Open Cut
42.8	WB089	Unnamed ditch	Ditch	33	Intermediate	Bore
42.8	WB090	Unnamed ditch	Ditch	6	Minor	Bore
43.2	WB091	Eaton Ditch	Ditch	3	Minor	HDD
43.3	WB092	Unnamed tributary	Ephemeral	3	Minor	Bore
43.5	WB093	Unnamed tributary	Intermittent	3	Minor	Open Cut
44.0	WB094	Unnamed tributary	Intermittent	6	Minor	Open Cut
44.2	WB095	Unnamed tributary	Intermittent	3	Minor	Open Cut
44.2	WB096	Unnamed tributary	Intermittent	3	Minor	Open Cut
45.0	WB097	Unnamed tributary	Ephemeral	3	Minor	Open Cut
45.2	WB098	Unnamed tributary	Ephemeral	3	Minor	Open Cut
45.3	WB099	Unnamed ditch	Ditch	9	Minor	Open Cut
45.3	WB100	Collins Lateral	Ditch	5	Minor	Bore
48.6	WB102	Pierce Lateral	Intermittent	21	Intermediate	Bore
58.4	WB103	Lone Tree Creek	Intermittent	9	Minor	Open Cut
66.6	WB104	Unnamed tributary	Ephemeral	38	Intermediate	Within construction workspace
69.3	WB106	Unnamed tributary	Intermittent	9	Minor	Open Cut
69.5	WB108	Unnamed tributary	Intermittent	54	Intermediate	Within construction workspace
45.4	WB111	Unnamed ditch	Ditch	17	Intermediate	Within construction workspace

APPENDIX E

HDD Inadvertent Return Contingency Plan

HDD Inadvertent Return Contingency Plan

Tallgrass Energy

Cheyenne Connector, LLC

Cheyenne Connector Pipeline Project

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INTRODUCTION

Horizontal Directional Drilling (HDD) is a steerable utility installation system using a surfaced-launched drill rig. HDD is commonly used to install pipelines beneath roads, rivers, wetlands and other obstacles. An HDD profile is typically designed to pass beneath these obstacles to avoid disruption or damage to surface structures. HDD is an efficient, safe, cost effective method for installing utilities and is considered an industry standard for trenchless utility installation. Drilling fluid is used throughout the operation to transport drill cuttings, reduce friction, and stabilize the drilled hole. Installation of a pipeline by HDD is generally accomplished in three stages. The first stage consists of directionally drilling a small diameter pilot hole along a designed path. The second stage involves enlarging this pilot hole to a diameter suitable for installation of the pipeline. The third stage consists of pulling the pipeline through the enlarged hole.

Formational drilling fluid losses typically occur when the drilling fluid flows through the pore spaces in the soil through which the HDD profile passes. An inadvertent return occurs when drilling fluid emerges at the ground surface or in any other undesired location from formation fluid loss.

This inadvertent return contingency plan provides specific procedures and steps for preventing, monitoring, detecting, and controlling releases of drilling fluid during the construction of the following HDD crossings:

- HDD#1 - Platte Valley Canal (MP 13.1)
- HDD#2 - Evans Ditch (MP 13.5)
- HDD#3 -Unnamed Ditch & Foreign Pipelines (MP 14.7)
- HDD#4 - Gilmore Canal - 1 (MP 15.3)
- HDD#5 - Weld County Road 47 (MP 15.7)
- HDD#6 - Weld County Road 49 (MP 16.8)
- HDD#7 - Weld County Road 46 & Neres Canal (MP 20.3)
- HDD#8 - Gilmore Canal - 2 (MP 23.6)
- HDD#9 - Weld Road & Union Pacific Railroad (MP 25.2)
- HDD#10 - Weld County Road 58 & Plum Ditch (MP 26.8)
- HDD#11 - South Platte River (MP 28.1)
- HDD#12 - Hwy 263 & Ogilvy Ditch (MP 28.5)
- HDD#13 - Lone Tree Creek & Foreign Pipelines (MP 33.7)
- HDD#14 - Greeley Number 2 Canal (MP 35.0)
- HDD#15 - Farm Pond & Weld County Road 76 (MP 37.1)
- HDD#16 - Eaton Ditch & Foreign Pipelines (MP 37.7)
- HDD#17 - Eaton Ditch - 2 (MP 40.9)

- HDD#18 - Eaton Ditch - 3 (MP 43.1)

DRILLING FLUID AND DRILLING FLUID SYSTEMS

The HDD process uses drilling fluids to facilitate many of the HDD operations. Drilling fluid is a slurry composed of water and bentonite clay intended to transport drill cuttings, reduce friction, and stabilize the drilled hole. Bentonite clay (sodium montmorillonite) is a naturally occurring hydrophilic clay that can absorb up to ten times its weight in water. Bentonite is inert, non-toxic and is a non-hazardous substance used for drilling potable water wells. The composition of the drilling fluids and its engineering properties are tested to ensure their suitability for the given subsurface conditions encountered along the alignment and at each individual HDD location

Depending on subsurface conditions encountered, polymers or lost circulation materials (LCM) may be added to the drilling fluid mixture. Polymers are often used to increase the carrying capacity of the drilling fluid or reduce clay adhesion. Lost circulation materials (e.g. organic materials, wood chips, etc.) may be used to seal drilling fluid surface releases return zone or to seal around the borehole to prevent drilling fluid from escaping into the formation and allow for the reestablishment of drilling fluid returns to the entry and/or exit pits. Many types of polymers and LCMs are available for use during HDD operations that are inert and environmentally benign.

Most drilling fluids, drilling fluid additives and polymers used in the HDD industry are NSF 60 compliant, as these products are also used in other rotary drilling applications such as water well drilling and completion. Therefore, if NSF 60 complaint products are used there will be no effects on water quality. Tallgrass will require the HDD contractor to use only NSF 60 compliant additives and polymers, and to submit Safety Data Sheets (SDSs) to verify.

During HDD operations, the drilling fluid is prepared in a mixing tank. The fluid is pumped at a flow rate ranging between 100 to 800 gallons per minute (gpm) through the center of the drill pipe to the bit or cutters. Return flow is through the annulus created between the wall of the boring and the drill pipe. The cuttings are then carried back to the entry pit. When in the entry pit, the drilling fluid is pumped to the fluid cleaning system. Typically, shaker screens, desanders, desilters and possibly centrifuges remove increasingly finer cuttings from the drilling fluid. The cleaned and recycled drilling fluid is returned to the mixing tank and pumps for reuse in the drilled hole. The cuttings are disposed of at an approved disposal site.

The environmental impact of a release of drilling fluid into a water body is a temporary increase in local turbidity until the drilling fluid dissipates with the current or settles to the bottom.

Drilling fluid is easily contained by standard erosion and sedimentation control measures such as stray bales and silt fence. Drilling fluid would be contained on entry and exit worksites by hay bales and silt fence installed and maintained around the perimeter of each site. Within the boundaries of the worksites, drilling fluid would be controlled using pits at the crossing entry and exit points and typical fluid handling equipment such as trash pumps.

INADVERTENT RETURN EVALAUATION AND PREVENTION

General

In the contingency planning for this project, prevention of an inadvertent return has been a significant consideration in the design the profile of the HDD crossing. A primary factor in selecting the pipeline crossing profile is the type of soil and/or rock the HDD profile will pass through and the depth of soil cover. Dense granular soils and competent rock are considered to have relatively low susceptibility to an inadvertent return potential. The second factor considered in developing a profile is adequate thickness of overlying soil.

Regardless of the subsurface conditions, there is typically a high risk of an inadvertent return within about 100 to 150 feet of the HDD entry and exit points, as the drill path approaches the ground surface with decreasing overburden confinement. Where areas with high potential for an inadvertent return are identified, steps can be taken to manage and contain drilling fluid to reduce impacts.

Personnel Responsibilities and Training

Personnel Responsibilities

The actions in this Plan are to be implemented by the following personnel:

- Chief Inspector – Tallgrass will designate a Chief Inspector ("CI") for the Project. The CI will have overall authority for construction activities that occur on their designated portion of the Project.
- HDD Inspector – Tallgrass will designate a HDD Inspector for the Project. The HDD Inspector will have overall authority for the HDD construction activities that occur on their designated portion of the Project and will report to the CI.
- Environmental Inspector – At least one Environmental Inspector ("EI") will be designated by Tallgrass to monitor the HDD activities. The EI will have peer status with all other project inspectors and will report directly to the Lead Environmental Inspector. The EI, along with all other inspectors and inspection personnel, will have the authority to stop activities that violate the environmental conditions of the FERC certificate (if applicable), other federal and state permits, or landowner requirements, and to order corrective action.
- HDD Superintendent – The HDD Superintendent is the senior on-site representative of the HDD contractor. The HDD Superintendent has overall responsibility for implementing this Plan on behalf of the HDD contractor. The HDD Superintendent will be familiar with the aspects of the drilling activity, the contents of the Plan and the conditions of approval under which the activity is permitted to take place. The HDD Superintendent will make available a copy of this Plan to the appropriate construction personnel. The HDD Superintendent will ensure that workers are properly trained and familiar with the necessary procedures for response to an inadvertent return.
- HDD Operator – The HDD Operator is the HDD contractor's driller operating the drilling rig and mud pumps. The HDD Operator is responsible for monitoring circulation back to the

entry and exit locations. In the event of loss of circulation, the HDD Operator must communicate the event to the HDD Superintendent and HDD contractor field crews. The HDD Operator is responsible for stoppage or changes to the drilling program in the event of an observed inadvertent return.

- HDD Contractor Personnel – During HDD installation, field crews will be responsible for monitoring the HDD alignment along with Tallgrass field representatives. Field crews, in coordination with the EI, are responsible for timely notifications and responses to observed releases in accordance with this Plan. The Lead EI ultimately must approve the action plan for mitigating the release.

Training

Prior to the start of HDD construction activities, all personnel involved in HDD operations will receive the site-specific training including but not limited to:

- Project specific safety training;
- Review provisions of this Plan and site-specific permit requirements;
- Review location of sensitive environmental resources at the site;
- Review drilling procedures for release prevention;
- Review the site-specific monitoring requirements;
- Review the location and operation of release control equipment and materials;
- Review protocols for reporting an observed inadvertent return

Surface and Subsurface Conditions

Surface Conditions

The initial step in the HDD design process and evaluation of the risk of an inadvertent return is to conduct a detailed site reconnaissance. During site reconnaissance, the proposed HDD site is evaluated for the availability of adequate workspace and suitable temporary ingress and egress for construction equipment and personnel; topographic features such as large elevation differentials that could limit or preclude the use of HDD technology; and potentially limiting surface features such as existing infrastructure and environmentally sensitive habitat areas. By selecting a crossing site with an optimal combination of the aforementioned features, an HDD can then be designed with an appropriate geometric profile and sufficient depth of cover for a particular crossing.

Subsurface Conditions

A thorough evaluation of the subsurface conditions along a proposed HDD alignment enables the designer to select a profile depth that passes through the most competent and desirable subsurface layer for drilling. Subsurface soil and groundwater conditions are explored by advancing exploratory borings to depths of 20 to 25 feet below the anticipated design profile depth. The borings are observed in the field during drilling and soil/rock samples are visually classified and logged. Laboratory tests, including moisture content, dry unit weight, sieve

analyses, unconfined compression and triaxial compression tests are completed on selected samples from the borings.

The subsurface data is then used in conjunction with the surface data to optimize the HDD profile so that it passes through and beneath the most competent subsurface layers, thereby reducing the potential for drilling fluid to migrate to the ground surface. Additionally, it provides favorable drilling conditions for the contractor reducing the likelihood of prolonged drilling activities which may increase the potential for instability of the drilled hole.

HDD Geometry

The HDD profile is designed to reduce the potential for an inadvertent return in sensitive areas to the extent possible considering site limitations. The type of subsurface material and the depth of cover material are two main factors considered in developing the profile of an HDD crossing.

The geometry of the pipeline profile can also affect the potential for drilling fluid seepage. In a profile which forces the pipe to make compound or excessively tight radii turns, downhole pressures can build up, thereby, increasing the potential for an inadvertent return. The HDD design profiles for the proposed HDD reduces this potential to the extent possible, with vertical curves appropriate for the product pipe diameter. Therefore, the potential for pressure buildup caused by pipeline geometry has been reduced.

Inadvertent Return Analysis

General

During HDD installation, drilling fluid is transported under pressure through the drill pipe string to the cutting tool. For HDD installations of this size, pump pressures of several hundred pounds per square inch (psi) and pump rates of 100 to 800 gpm are typical. The drilling fluid typically has a specific gravity ranging from 1.1 to 1.2 (approximately 69 to 75 pounds per cubic foot [pcf]).

The total drilling fluid pressure at the cutting tool is a function of pumping pressures, the elevation difference between the drill rig and the cutting tool and friction losses. Soil and rock formations along the drill path experience maximum drilling fluid pressures in the immediate proximity of the drill bit or reaming tools. The energy (pressure) of the drilling fluid is steadily diminished along its path from the drill rig to the cutting tool and back to the drill rig through the annulus of the hole. Thus, the pumping pressure required to circulate the drilling fluid increases as the drill bit advances farther from the drill rig. Typically, the annular drilling fluid pressure at the cutting tool can range from 15 to 25 percent of the pump pressure.

Drilling Fluid Loss

Drilling fluid circulation may be reduced or lost during HDD operations by drilling fluid loss to the surrounding formation or by the accumulation of cuttings downhole that create a blockage which may result in an inadvertent return. These two processes are discussed below:

- Formational fluid loss occurs when drilling fluid flows into surrounding permeable soil units either within the pore spaces of the soil or along preexisting fractures or voids in the formation.
- Subsequent loss of drilling fluid can occur where the combined resisting force of the available overburden pressure and the shear strength of the overburden soil is less than the hydrostatic drilling fluid pressure and the pressures applied to the surrounding soil from the drilling fluid at the cutting tool.

Formational drilling fluid losses typically occur when the drilling fluid flows through the pore spaces in the soil through which the HDD profile passes. Thus, a formation with a higher porosity can potentially absorb a larger volume of drilling fluid than a formation with a lower porosity. Silty sands, silts and clays typically have a low susceptibility to formational drilling fluid losses. Coarse sand and gravel units with low percentages of silt and clay have a moderate to high susceptibility for drilling fluid loss. The proper management of the drilling fluid properties can reduce the volume of formational drilling fluid loss.

Inadvertent Return

An inadvertent return occurs when drilling fluid emerges at the ground surface or in any other undesired location such as wetlands, utility trenches, basements, roads, railroads, and waterbodies. In practice, an inadvertent return typically occurs in close proximity to the entry and exit points where annular pressures are high and soil cover is thin. An inadvertent return can also occur at locations along a drill path where there are low shear strength soils, where soil cover is relatively thin or along preexisting fractures or voids. Other locations where an inadvertent return can occur are along preferential pathways such as exploratory boring locations, within utility trenches, or along the edges of existing subsurface structures such as piles or utility poles.

The HDD contractor's construction procedures constitute another important factor influencing when and where drilling fluid loss occurs. If the HDD contractor operates with insufficient drilling fluid flow rates, inadequate drilling fluid properties or excessive rates of penetration, the annulus may become blocked through an accumulation of drill cuttings falling out of suspension. This can occur within formations that typically have a low potential for an inadvertent return. If the accumulation of cuttings creates a blockage downhole, the annulus may become over-pressurized, leading to the potential of an inadvertent return. The contractor has the responsibility to mitigate the risk of overpressure by techniques stated in more detail in the next section. Additionally, a Tallgrass HDD inspector will be assigned full-time to the site.

Responsibility of Contractor

The drilling contractor is responsible for execution of the directional drilling operation, including actions for monitoring, detecting and controlling drilling fluid loss. The HDD contractor should utilize appropriate best management practices and drilling methods to limit the potential for an inadvertent return. Such practices include the contractor taking care such that penetration rates will not exceed the rate of cuttings removal from the hole, maintaining proper drilling fluid properties to clean the hole and not allow excess solids to build up in the

drilling fluid, and maintaining drilling fluid returns at all times during the pilot hole, hole opening and pullback processes. The contractor's means and methods significantly influence the potential for an inadvertent return to occur during construction. Tallgrass' HDD Inspector will closely supervise the progress and actions of the drilling contractor.

INADVERTENT RETURN MONITORING AND DETECTION

Monitoring Procedures

The HDD Inspector, EI, and all HDD Contractor personnel are responsible for continuously monitoring operations during drilling activities. Monitoring will include:

- Inspection along the drill path, including monitoring the waterbody for evidence of a release. Inspection of the ground surface along the drill path will be completed at least every two hours during pilot hole and reaming operations.
- Continuous examination of drilling fluid pressures and the flow rate of the drilling fluid returns.
- The drilling operator will provide information regarding drilling conditions to the HDD Inspector and EI throughout the course of drilling activities.
- In the case of an in-stream release, monitoring may include an inspection by boat to determine plume movement within the waterbody.
- If an in-stream release occurs, the EI will collect drilling fluid returns at the borehole entry location for future analysis, as required.
- Monitoring will be documented by the HDD Inspector and/or EI.

Drilling Fluid Pressures

Drilling fluid pressures are affected by several factors. A description of some of these factors and how they can be managed follows.

- *Drilling fluid density.* Greater drilling fluid densities result in greater downhole pressures. A large component of drilling fluid density is the concentration of cuttings in the fluid. By controlling drilling and hole opening penetration rates and maximizing the effectiveness of drilling fluid recycling equipment, drilling fluid densities can be kept below acceptable limits.
- *Drilling fluid viscosity.* Greater drilling fluid viscosities result in greater downhole pressures. However, greater viscosities also help seal off fissures and other escape paths into the surrounding formation from the HDD borehole. Similarly, increased viscosity improves the cuttings carrying capability of the drilling fluid. Drilling fluid viscosity must be carefully managed to obtain a balance between these conflicting requirements.
- *Drilled hole cleanliness.* Cuttings tend to settle out of the flow of drilling fluid in the annular space around the drill pipe string. Accumulations of cuttings or cutting beds restrict the flow of drilling fluid through the annular space. This results in an increase in the pressure

required to maintain flow. Careful management of drilling fluid properties and the regular use of borehole swabbing techniques will keep the borehole free of cuttings beds and their associated pressure increases.

- The drilling fluid pressures in the borehole will vary throughout the installation processes. They will change with the depth of cover, the distance drilled, and the borehole diameter. However, changes in pressure should be gradual and can to a large extent be predicted. Rapid or unexpected changes in pressure are indicators of potential problems downhole. It is critical that drilling fluid pressures be monitored and recorded throughout the pilot hole process, when pressures are the highest. There are two techniques available for drilling fluid pressure monitoring. They are drill pipe pressure monitoring and downhole annular pressure monitoring.

Drill Pipe Pressure Monitoring

Pressure in the drill pipe is measured at the surface by the drilling fluid pump system. The difference between this pressure and the downhole pressure in the borehole is the pressure drop experienced by the fluid as it flows down the drill pipe string and through the downhole tool. Hence drill pipe pressure gives only an approximate indication of the downhole pressure before the drilling fluid exits the tooling.

Careful monitoring of drill pipe pressure can provide an indication of a rapid or unexpected change in downhole pressure.

Downhole Pressure Monitoring

Downhole pressure monitoring is typically only used during the pilot hole operation. This is a sophisticated technique that involves the use of a pressure transducer incorporated into the downhole survey probe immediately behind the drilling assembly. The transducer measures the drilling fluid pressure in the annular space around the probe. Data from the transducer is transmitted to the drill rig at the surface via the same electrical wire line used to transmit survey data.

Drilling Fluid Volume Management

If drilling fluid is not allowed to escape from the drilled hole, then the volume of fluid pumped downhole would return to the surface via the annular space. However, it is typical that a portion of the drilling fluid will be lost to the surrounding formation. Even though some drilling fluid loss should be expected, a program for monitoring and managing the volumes of drilling fluid used is beneficial in identifying sudden decreases in drilling fluid volume, which could be a sign of a potential inadvertent return.

Throughout the HDD process the contractor will keep a running balance of the total volume of fluid pumped downhole and the total volume recovered from the return pits. The difference between these volumes will be the volume lost from the drilled hole.

If the rate of loss of fluid is greater than expected or if it suddenly increases this could be an indication of a problem downhole. Measures to reduce the loss of fluid from the borehole would be implemented as described in this plan.

Detection

HDD is a technically advanced process involving skilled operators. The detection of conditions that indicate a potential inadvertent return is highly dependent upon the skills and experiences of the drilling crew. Each drilling situation is unique in that the behavior of the subsurface soil is highly variable and difficult to predict. There is no down-hole monitoring equipment that can specifically detect the potential for an inadvertent return. It is a combination of factors, which must be properly interpreted, that may indicate conditions that can have the potential of causing an inadvertent return.

A downhole annular pressure tool that can measure downhole annular pressures in real-time during the drilling process can be included in the pilot hole jetting assembly and/or reaming assembly to assist in measuring and detecting elevated drilling fluid pressure conditions that could result in an inadvertent return. By using a downhole annular pressure tool, the drilling operator can observe when elevated downhole annular pressures occur, which could indicate an elevated risk of an inadvertent return in the formation. Using this tool, the drilling operator could observe a significant decrease in downhole annular pressure which could indicate that an inadvertent return has occurred. In this case, the drilling operator could disengage the drilling fluid pumps to limit the amount of drilling fluid being pumped downhole and potentially prevent an inadvertent return.

INADVERTENT RETURN RESPONSE, CONTAINMENT AND CONTROL

Inadvertent Return Response

By actively monitoring drilling operations, Tallgrass intends to correct problems before they occur. The HDD contractor will also monitor the condition of the ground surface around the HDD alignment throughout the HDD drilling process.

If during HDD operations, drilling fluid is detected/observed at the surface, the drilling crew will take immediate corrective action. The first corrective action is to stop the drilling fluid pumps. By stopping the pumps, the pressure in the hole will quickly dissipate. With no pressure in the hole, the surface seepage will stop.

The inadvertent return will be assessed by the HDD Superintendent, EI, and HDD Inspector to determine an estimated volume of the release. They will also assess the potential of the release to reach adjacent waterbodies, wetlands, or other types of infrastructure (e.g., wells). The HDD Superintendent will assess the drilling parameters (depth, type of formation, fluid flow rate, and drilling fluid characteristics) and incorporate appropriate changes.

The HDD Superintendent, EI, and HDD Inspector will coordinate installation of appropriate containment structures and implement additional response measures. Site topography in

conjunction with access for personnel and equipment to the release site are major factors in determining the methods used for containment and disposal.

Inadvertent Return Containment

After assessment of the inadvertent return, the following measures will be implemented to stop or reduce the extent and severity of the release:

Upland Release

If an inadvertent return occurs in upland areas, regardless of whether the release is inside or outside the project right-of-way, the drilling crew will take immediate corrective action to contain the release and to prevent migration.

- Typically, containment is achieved by excavating a small sump pit at the site of the release and/or surrounding the release with containment materials (i.e. hay bales, silt fence and/or sand bags). When contained, the drilling fluid is either collected by vacuum trucks or pumped to a location where vacuum trucks can be accessed. The fluids are then transported either back to the HDD drill rig or to a disposal site.
- Additional berms will be constructed around the release site as directed by the EI to prevent release materials from flowing into a waterbody.
- If the amount of an upland release does not allow practical collection, the affected area will be diluted with fresh water and allowed to dry. Steps will be taken (such as berm, silt fence and/or hay bale installation) to prevent silt-laden water from flowing into a waterbody.

Wetland Release

If an inadvertent return occurs in a wetland, either inside or outside the project right-of-way, the drilling crew will take immediate corrective action to contain the release and to prevent migration. These will include:

- Evaluate the amount of release to determine if containment structures are warranted and if they will effectively contain the release.
- Promptly implement appropriate containment measures to contain and recover the slurry.
    - Efforts to contain and recover slurry in wetlands may result in further disturbance by equipment and personnel, and possibly offset the benefit gained in removing the slurry.
    - If the amount of the slurry is too small to allow the practical collection from the affected area, the fluid will be diluted with fresh water or allowed to dry and dissipate naturally.
- If the release cannot be controlled or contained, immediately suspend drilling operations until appropriate containment is in place.
- Remove the fluids using either a vacuum truck or by pumping to a location where a vacuum truck is accessible.

Waterbody Release

If a release occurs within a waterbody, the drilling crew will take immediate corrective action to contain the release to the extent practical. The following approach will generally be followed after an inadvertent return has been isolated, and the flow has stopped. Because the unpredictable nature of the locations and environment in which an inadvertent return may occur, this description cannot encompass all possible approaches to clean-up under all conditions. If necessary, drilling operations will be reduced or suspended to assess the extent of the release and to implement corrective actions.

The following are response techniques that may be applied for a waterbody release:

- If the bentonite material flows overland prior to entering the waterbody, installation of containment materials such as silt fencing or sandbag dams at the point of entry will be used to reduce or stop the flow; if the release is directly into the waterbody, other means to isolate the vent site from the flowing waterbody will be used.
- If the release occurs in non-flowing water less than about 2 feet deep, a vacuum truck or pump(s), with a sufficient hose will remove the drilling fluid. Personnel will remove the bentonite, working from downstream to upstream, to allow maximum visibility. Hand tools may be used to scarify the sediments and ensure removal to the maximum extent practicable.
- If necessary, water may be temporarily diverted using barriers such as sandbags to isolate the impacted area. If water diversion is successful, a vacuum truck or pump(s), with a sufficient hose will remove the drilling fluid.
- If an inadvertent return occurs in a waterbody that is more than two feet in depth or has significant flow, there are limitations to what can be done to contain or control the drilling fluid that has been released. If it is impracticable to remove the drilling fluid, a clear written explanation of the current conditions and the forward plan of action will be submitted to the applicable regulatory agencies. If the agencies approve the forward plan of action, drilling operations will resume.
- Measures will be implemented to limit the further release of fluid into the waterbody including the introduction of lost circulation materials into the drilling fluid, increasing drilling fluid viscosity and the temporary reduction of drilling fluid pumping rates. Drill penetration rates will also be temporarily increased to move the drilling assembly away from the release point as quickly as possible for the release to stop quickly.
- Exposed soils will have temporary erosion control measures established as soon as practical with permanent erosion controls established as soon as possible.
- Disturbance of vegetation will be kept to a minimum and all disturbed vegetation will be restored.

Inadvertent Return Control

After an inadvertent return has been contained, measures will be taken to control the inadvertent return and to reduce the chance of recurrence. Developing the corrective

measures will be a joint effort of Tallgrass, the HDD Inspector, the EI, and the HDD contractor and will be site and problem specific. Below is a summary of possible corrective measures that could be implemented in the event of an inadvertent return:

- Increase the drilling fluid viscosity in an attempt at sealing the point at which fluid is leaving the drilled hole. The drilling operation may be suspended for a short period (e.g. overnight) to allow the fractured zone to become sealed with the higher viscosity fluid.
- If increasing the drilling fluid viscosity is ineffective, LCM may be introduced into the hole by incorporating them in the drilling fluid and pumping the material down-hole. The drilling operation may again be suspended for a short period (e.g. overnight) to allow the fractured zone to become sealed with the lost circulation materials.
- Depending on the location of the fractured zone, a steel casing may be installed that is of sufficient size to receive the largest expected down-hole tools for the crossing. This casing installation provides a temporary conduit for drilling fluids to flow while opening the remaining section of the hole to a diameter acceptable for receiving the proposed product pipe. To alleviate future concerns with the steel casing after the HDD installation is completed, the casing is generally extracted from the hole prior to or just after completing the HDD installation. However, there have been instances when attempts at extracting the steel casing were unsuccessful.
- In the event fluid flow is still not regained through the annulus of the drilled hole and a steel casing installation is not selected, the HDD contractor may elect to install a grout mixture into the drilled hole in an attempt at sealing the fractured zone. When opting to utilize this approach, the down-hole drilling assembly is generally extracted from down-hole. The existing hole will be re-drilled to the point at which it had previously been drilled prior to having encountered the loss of drilling fluid.
- Another approach that can be implemented in the event the grouting program within the drilled hole is unsuccessful at sealing the fractured zone is attempting a grouting program from the surface. This approach is only viable in areas where drilling rigs with vertical drilling capabilities can access the HDD alignment. If a surface grouting program is selected, the HDD drilling assembly is extracted from down-hole. Multiple holes are then drilled vertically on either side and along the HDD alignment to allow for grout slurry to be pumped into the fracture zone where the drilling fluid had previously been lost from the drilled hole. This process can take several days to complete in order to insert the grout in a grid pattern that covers the full fractured zone, during which time the HDD operation is suspended. Upon completion of the surface grouting program, the HDD operation resumes, and a pilot hole must be reestablished through the grouted formation.

Response Equipment

Equipment for containing, controlling and cleaning up an inadvertent return will be kept on site throughout the installation process. Heavy equipment not specifically designated for control and cleanup of drilling fluid such as backhoes will also be available on site.

The following list identifies some materials and equipment that will be maintained at each HDD site in sufficient quantities to help ensure containment of an inadvertent return:

- Weed free straw or hay bales
- Sand bags
- Stakes to secure bales
- Silt fence
- Shovels, rakes, brooms and buckets
- Trash pumps and flexible hose
- Light tower(s), so that cleanup work could continue after dark
- A boat with appropriate personal safety equipment at major water body crossings depending on seasonal flows
- Vacuum trucks

Reporting

If an inadvertent return occurs within a stream, wetland or wetland buffer, or other sensitive resources, or poses a threat to public safety, the Lead EI will immediately notify the Tallgrass Environmental Manager.

Regulatory agencies will be contacted as required by the agencies reporting requirements. Tallgrass will inform the regulatory agencies if any threat to public health and safety exist and explain whether the release can be corrected without incurring additional environmental impact. If necessary, drilling operations will be reduced or suspended to assess the extent of the release and to implement corrective actions. If public health and safety are threatened, drilling fluid circulation pumps will be turned off and work will stop until the threat to public health and safety are mitigated.

The Lead EI will provide the following:

- The location of the inadvertent return;
- A description of the area affected; and
- The containment measures implemented.

As soon as possible, a report, containing the following information, will be prepared and emailed to the appropriate agencies.

- The cause of the release;
- Photographs of the release site;
- The area affected;
- The location and size of the resulting work area; and
- The location of any drainage, streams or wetlands in the area and the distance to them from the inadvertent return site.

Upon completion of HDD activities, a report will be prepared that summarizes:

- The events leading up to the inadvertent return;
- The measures taken to minimize the impacts following the release;
- Any impacts from the release;
- Mitigation for the impacts from the release; and
- Agency contacts.

Abandonment

If the drill path becomes obstructed and cannot be cleared or if corrective actions do not prevent or control releases from occurring, Tallgrass may opt to re-drill the hole along a different alignment or suspend the project altogether. In either case, the following procedures will be implemented to abandon the drill hole.

The method for sealing the abandoned drill hole is to pump thickened drilling fluid into the hole as the drill assembly is extracted, and using cement grout to make a cap.

Closer to the surface (within approximately 10 feet of the surface), a soil cap will be installed by filling with soil extracted during construction of the pit and berms.

The borehole entry location and, if necessary, the exit location will be graded and seeded by the contractor to its original grade and condition after the drill hole has been abandoned.

APPENDIX F

Wetlands Crossed by the Pipeline Project

Wetlands Impacted by the Cheyenne Connector Pipeline Project				
Milepost	**Wetland ID**	**Length (feet) of Crossing (if centerline)**	**Crossing Method**	**Total Acreage of Temporary Disturbance**
12.6	WL001	42	Open Cut	**0.109**
12.8	WL002	212	Open Cut	**0.337**
13.1	WL003	20	HDD	0.000
13.4	WL004	6	HDD	0.000
13.8	WL005	101	Open Cut	**0.105**
14.3	WL006	Within construction workspace	None	**0.041**
14.4	WL007	Within construction workspace	None	**<0.001**
14.5	WL008	Within construction workspace	None	**0.258**
14.7	WL009	50	HDD	0.000
14.8	WL010	218	HDD	0.000
14.9	WL011	141	Open Cut	**0.548**
14.9	WL013	Within construction workspace	None	**0.495**
15.1	WL012	454	Open Cut	**0.783**
15.7	WL013R	664	Open Cut	**1.488**
15.9	WL014	21	HDD	0.000
19.9	WL014R	8	Bore	0.000
20.4	WL016[1]	121	Open Cut	**0.213**
20.6	WL018	24	HDD	0.000
24.8	WL021	32	Open Cut	**0.045**
25.4	WL024	15	HDD	0.000
25.4	WL025	None	HDD	0.000
27.1	WL026	61	HDD	0.000
27.3	WL027[1]	12	Open Cut	**0.042**
27.7	WL028	10	Open Cut	**0.026**
27.8	WL029	10	Open Cut	**0.023**
28.1	WL030	186	HDD	0.000
28.4	WL031	20	HDD	0.000
28.6	WL032	165	HDD	0.000
31.0	WL034	93	Bore	0.000
31.3	WL035	14	Open Cut	**0.031**
31.3	WL036	26	Open Cut	**0.055**
33.3	WL037	11	Bore	0.000
33.9	WL038	28	HDD	0.000
33.9	WL039	9	HDD	0.000
34.1	WL040	17	Open Cut	**0.026**
34.4	WL041	13	Bore	0.000
35.2	WL042	12	HDD	0.000

Wetlands Impacted by the Cheyenne Connector Pipeline Project				
Milepost	**Wetland ID**	**Length (feet) of Crossing (if centerline)**	**Crossing Method**	**Total Acreage of Temporary Disturbance**
37.9	WL044	22	HDD	0.000
38.9	WL046	Within construction workspace	None	**0.288**
41.2	WL047	11	HDD	0.000
41.2	WL048	None	HDD	0.000
41.2	WL049	50	HDD	0.000
41.4	WL050	12	Open Cut	**0.023**
41.4	WL051	27	Open Cut	**0.042**
42.8	WL052	7	Bore	0.000
43.2	WL053	6	HDD	0.000
48.6	WL055	20	Bore	0.000
58.4	WL056	44	Open Cut	**0.073**
69.5	WL059	100	Open Cut	**0.173**
69.6	WL060	Within construction workspace	None	**0.009**
28.7	WL061	9	HDD	0.000
45.3	WL062	13	Bore	0.000
Total Acres of Wetland Disturbance				**5.233**

APPENDIX G

Access Roads Required for the Pipeline Project

Temporary and Permanent Access Roads associated with the Cheyenne Connector Pipeline Project								
Approximate milepost (facility)	**Access road name**	**Existing condition**	**Approximate length (feet)**	**Proposed modification**	**Approximate temporary right-of-way width (feet)**	**Approximate permanent right-of-way width (feet)**	**Construction requirements (acres)**	**Operation requirements (acres)**
0.0 (Lancaster M&R Station)	PAR-001	Gravel lane and grass area	350	Build new	50	30	0.30	0.24
0.6	TAR-001	Gravel lane	1,977	Blading and gravel	50	0	2.27	0.00
0.6	TAR-002	Gravel lane	174	Blading and gravel	50	0	0.18	0.00
2.9	TAR-003	Gravel/dirt lane	5,383	Grading and gravel	50	0	6.16	0.00
2.6	TAR-004	Gravel lane	80	Blading and gravel	50	0	0.08	0.00
3.4	TAR-005	Grass field	48	Grading	50	0	0.04	0.00
3.5	TAR-006	Grass field	310	Grading	50	0	0.35	0.00
4.9	TAR-007	Gravel/dirt lane	5,150	Blading, grading and gravel	50	0	5.92	0.00
5.1	TAR-008	Gravel/dirt lane	598	Blading and gravel	50	0	0.69	0.00
5.7	TAR-009	Gravel lane	577	Blading and gravel	50	0	0.69	0.00
6.6	TAR-010	Gravel lane and grass field	281	Blading, grading and gravel	50	0	0.34	0.00
6.7	TAR-011	Gravel lane	208	Blading and gravel	50	0	0.24	0.00
6.7	TAR-012	Gravel lane	226	Blading and gravel	50	0	0.28	0.00
7.2	TAR-013	Dirt lane	376	Blading	50	0	0.46	0.00
8.2	TAR-014	Gravel lane	231	Blading and gravel	50	0	0.29	0.00
8.6	TAR-015	Gravel lane and grass area	225	Blading and gravel	50	0	0.28	0.00

Temporary and Permanent Access Roads associated with the Cheyenne Connector Pipeline Project								
Approximate milepost (facility)	**Access road name**	**Existing condition**	**Approximate length (feet)**	**Proposed modification**	**Approximate temporary right-of-way width (feet)**	**Approximate permanent right-of-way width (feet)**	**Construction requirements (acres)**	**Operation requirements (acres)**
8.7	TAR-016	Gravel lane	426	Blading and gravel	50	0	0.51	0.00
9.0 (Latham M&R Station)	PAR-002	Grass field	798	Build new	50	30	0.80	0.54
9.1 (Mewbourn M&R Station)	PAR-003	Grass field	191	Build new	50	30	0.12	0.12
10.3	TAR-018	Gravel lane	318	Blading and gravel	50	0	0.38	0.00
12.1	TAR-019	Dirt lane	1,315	Blading and gravel	50	0	1.53	0.00
13.0	TAR-020	Crop land	2,895	Grading	50	0	3.35	0.00
13.3	TAR-021	Gravel land and grass field	4,123	Blading, grading, and gravel	50	0	4.68	0.00
14.2	TAR-022	Gravel lane	2,269	Blading and gravel	50	0	2.60	0.00
15.1	TAR-023	Gravel lane and grass field	2,941	Blading, grading, and gravel	50	0	3.25	0.00
15.2	TAR-024	Gravel lane	1,083	Blading and gravel	50	0	1.25	0.00
15.6	TAR-024A	Gravel lane	164	Blading and gravel	50	0	0.06	0.00
16.2	TAR-024B	Grass field	163	Blading, grading, and gravel	50	0	0.19	0.00
16.9	TAR-025	Gravel lane	2,443	Blading and gravel	50	0	2.74	0.00

Temporary and Permanent Access Roads associated with the Cheyenne Connector Pipeline Project								
Approximate milepost (facility)	**Access road name**	**Existing condition**	**Approximate length (feet)**	**Proposed modification**	**Approximate temporary right-of-way width (feet)**	**Approximate permanent right-of-way width (feet)**	**Construction requirements (acres)**	**Operation requirements (acres)**
17.4 (MLV #1)	PAR-004R	Grass field	189	Build new	50	30	0.13	0.13
17.7	TAR-026	Gravel lane	1,514	Blading and gravel	50	0	1.76	0.00
18.3	TAR-027	Dirt lane	1,410	Blading and gravel	50	0	1.64	0.00
20.4	TAR-028	Gravel lane and crop field	1,861	Blading, grading, and gravel	50	0	2.18	0.00
20.5	TAR-029	Gravel lane and grass field	682	Blading, grading, and gravel	50	0	0.81	0.00
20.7	TAR-030	Gravel lane and grass field	2,087	Blading, grading, and gravel	50	0	2.39	0.00
20.9	TAR-031	Dirt lane	1,497	Blading and gravel	50	0	1.71	0.00
21.5	TAR-032	Dirt lane and grass field	2,218	Blading, grading, and gravel	50	0	2.54	0.00
21.7	TAR-033	Dirt lane and grass field	2,137	Blading, grading, and gravel	50	0	2.47	0.00
22.2	TAR-034	Gravel lane	413	Blading and gravel	50	0	0.50	0.00
22.5	TAR-035	Dirt lane	1,622	Blading and gravel	50	0	1.83	0.00
23.5 (O'Connor Pig Receiver)	PAR-005	Dirt lane	1,179	Build new	50	30	0.93	0.81

Temporary and Permanent Access Roads associated with the Cheyenne Connector Pipeline Project								
Approximate milepost (facility)	**Access road name**	**Existing condition**	**Approximate length (feet)**	**Proposed modification**	**Approximate temporary right-of-way width (feet)**	**Approximate permanent right-of-way width (feet)**	**Construction requirements (acres)**	**Operation requirements (acres)**
23.5 (O'Connor Meter Station)	PAR-008A	Grass area	170	Build new	50	30	0.14	0.12
23.5 (O'Connor Meter Station)	PAR-008R	Gravel lane and grass area	902	Build new	50	30	1.03	0.62
24.1	TAR-036	Dirt lane	3,509	Blading and gravel	50	0	4.05	0.00
24.6	TAR-037	Gravel lane	1,608	Blading and gravel	50	0	1.87	0.00
24.8	TAR-038	Dirt lane	1,600	Blading and grave	50	0	1.87	0.00
25.1	TAR-039	Gravel lane	2,021	Blading and gravel	50	0	2.26	0.00
25.4	TAR-040	Gravel lane	2,794	Blading and gravel	50	0	3.15	0.00
25.4	TAR-041	Crop land	1,424	Grading	50	0	1.66	0.00
25.5	TAR-042	Crop land	1,257	Grading	50	0	1.39	0.00
25.9	TAR-043	Gravel lane	2,081	Blading and gravel	50	0	2.17	0.00
26.2	TAR-045	Gravel lane crop field	1,487	Blading, grading, and gravel	50	0	1.66	0.00
26.5	TAR-046	Gravel lane and crop field	3,483	Blading, grading, and gravel	50	0	3.30	0.00
27.3	TAR-047	Grass field	656	Grading	50	0	0.72	0.00
27.3	TAR-048	Grass field	684	Grading	50	0	0.78	0.00
27.7	TAR-049	Gravel lane	75	Blading and gravel	50	0	0.11	0.00
27.8	TAR-050	Grass field	33	Grading	50	0	0.06	0.00

Temporary and Permanent Access Roads associated with the Cheyenne Connector Pipeline Project								
Approximate milepost (facility)	**Access road name**	**Existing condition**	**Approximate length (feet)**	**Proposed modification**	**Approximate temporary right-of-way width (feet)**	**Approximate permanent right-of-way width (feet)**	**Construction requirements (acres)**	**Operation requirements (acres)**
28.2	TAR-051	Gravel lane	1,332	Blading and gravel	50	0	1.55	0.00
28.5	TAR-052	Dirt lane	2,588	Blading	50	0	2.94	0.00
28.7	TAR-053	Gravel lane and crop field	5,129	Blading, grading, and gravel	50	0	5.70	0.00
29.1	TAR-054	Gravel lane	804	Blading and gravel	50	0	0.79	0.00
29.4	TAR-055	Gravel lane	191	Blading and gravel	50	0	0.24	0.00
30.1	TAR-056	Gravel lane	79	Blading and gravel	50	0	0.11	0.00
30.8	TAR-057	Dirt lane	1,942	Blading	50	0	2.15	0.00
31.6	TAR-058	Gravel lane and crop field	1,371	Blading, grading, and gravel	50	0	1.60	0.00
32.6	TAR-059	Crop land	599	Grading	50	0	0.72	0.00
33.3	TAR-060	Crop land	1,506	Grading	50	0	1.51	0.00
33.8	TAR-061	Gravel lane and crop field	1,022	Blading, grading, and gravel	50	0	1.10	0.00
34.0	TAR-062	Gravel lane	547	Blading and gravel	50	0	0.49	0.00
34.4 (MLV #2)	PAR-006	Grass field	63	Build new	50	30	0.05	0.04
34.6	TAR-063	Gravel lane	689	Blading and gravel	50	0	0.83	0.00
34.8	TAR-064	Crop land	680	Grading	50	0	0.80	0.00
35.2	TAR-065	Gravel lane	723	Blading and gravel	50	0	0.86	0.00
35.5	TAR-066	Crop land	716	Grading	50	0	0.84	0.00
37.2	TAR-067	Gravel lane	1,998	Blading and gravel	50	0	2.28	0.00

Temporary and Permanent Access Roads associated with the Cheyenne Connector Pipeline Project								
Approximate milepost (facility)	**Access road name**	**Existing condition**	**Approximate length (feet)**	**Proposed modification**	**Approximate temporary right-of-way width (feet)**	**Approximate permanent right-of-way width (feet)**	**Construction requirements (acres)**	**Operation requirements (acres)**
37.4	TAR-068	Gravel lane	845	Blading and gravel	50	0	0.81	0.00
37.9	TAR-069	Dirt lane	2,726	Blading, grading, and gravel	50	0	2.87	0.00
37.9	TAR-070	Gravel lane	876	Blading and gravel	50	0	1.01	0.00
38.9	TAR-071	Dirt lane	2,364	Blading, grading, and gravel	50	0	2.74	0.00
41.4	TAR-072	Dirt lane	695	Blading, grading, and gravel	50	0	0.71	0.00
43.6	TAR-073	Dirt lane	2,750	Blading, grading, and gravel	50	0	3.04	0.00
43.9	TAR-074	Dirt lane	4,245	Blading, grading, and gravel	50	0	4.77	0.00
47.8	TAR-075	Dirt lane	352	Blading, grading, and gravel	50	0	0.43	0.00
48.3	TAR-076	Dirt lane	988	Blading, grading, and gravel	50	0	0.70	0.00
51.3	TAR-077	Gravel lane	907	Blading and gravel	50	0	1.06	0.00
51.8 (MLV #3)	PAR-007	Grass field	268	Build new	50	30	0.22	0.15
61.9	TAR-078	Gravel lane	333	Blading and gravel	50	0	0.46	0.00
62.4	TAR-079	Gravel lane	314	Blading and gravel	50	0	0.44	0.00

Temporary and Permanent Access Roads associated with the Cheyenne Connector Pipeline Project								
Approximate milepost (facility)	**Access road name**	**Existing condition**	**Approximate length (feet)**	**Proposed modification**	**Approximate temporary right-of-way width (feet)**	**Approximate permanent right-of-way width (feet)**	**Construction requirements (acres)**	**Operation requirements (acres)**
63.4	TAR-080	Dirt lane	1,084	Blading, grading, and gravel	50	0	1.27	0.00
64.4	TAR-081	Grass field	591	Blading, grading, and gravel	50	0	0.70	0.00
65.7	TAR-082	Dirt lane	3,201	Blading, grading, and gravel	50	0	3.70	0.00
67.1	TAR-083	Dirt lane	3,782	Blading, grading, and gravel	50	0	4.32	0.00
67.0	TAR-084	Dirt lane	32	Blading, grading, and gravel	50	0	0.02	0.00
67.4	TAR-085	Dirt lane	624	Blading, grading, and gravel	50	0	0.68	0.00
68.7	TAR-086	Dirt lane	1,370	Blading, grading, and gravel	50	0	1.59	0.00
69.8	TAR-087	Dirt lane	1,329	Blading, grading, and gravel	50	0	1.54	0.00
71.0	TAR-088	Gravel lane and grass field	2,911	Blading, grading, and gravel	50	0	3.14	0.00
71.0 (Connector M&R Station)	TAR-089	Gravel lane	149	Blading and gravel	50	0	0.18	0.00
Total	**--**	**--**	**134,368**	**--**	**--**	**--**	**146.0**	**2.7**

APPENDIX H

Estimated Unmitigated HDD Noise Levels at Nearest NSAs for the Pipeline Project

Estimated Unmitigated HDD Noise Levels at Nearest NSAs for the Cheyenne Connector Pipeline Project							
No.	**HDD Crossing**	**Entry or Exit Site**	**Distance (Direction) of Nearest NSA to HDD**	**Ambient L_{dn} (dBA)**	**Sound Level (L_{dn}) of HDD (dBA)**	**L_{dn} of HDD + Ambient (dBA)**	**Increase Above Ambient (dB)**
#2	Evans Ditch HDD	Entry	1,700 ft. (E)	42.4	51.6	52.1	9.7
		Exit	500 ft. (E)	42.4	54.3	54.6	12.2
#3	Ditch and Foreign Pipelines HDD	Entry	2,300 ft. (SW)	42.7	48.3	49.3	6.6
		Exit	2,400 ft. (NNE)	47.4	36.6	47.7	0.3
#6	Weld County Road 49 HDD	Entry	950 ft. (ESE)	46.4	59.6	59.8	13.4
		Exit	450 ft. (SW)	46.4	54.2	54.9	8.5
#7	Road 46 and Neres Canal HDD	Entry	800 ft. (W)	47.8	61.3	61.5	13.7
		Exit	1,200 ft. (NE)	47.8	45.7	49.9	2.1
#9	Weld Road and UP Railroad	Entry	600 ft. (W)	50.6	62.2	62.5	11.9
	HDD	Exit	1,100 ft. (W)	50.6	44.8	51.6	1.0
#10	Highway 58 and Plum Ditch	Entry	1,200 ft. (NE)	53.8	54.6	57.2	3.4
	HDD	Exit	1,100 ft. (SW)	53.8	46.6	54.6	0.8
#11	South Platte River HDD	Entry	700 ft. (W)	46.4	62.7	62.8	16.4
		Exit	1,000 ft. (N)	47.8	47.6	50.7	2.9
#12	Hwy 263 and Ogilvy Ditch HDD	Entry	900 ft. (N)	46.4	60.1	60.3	13.9
		Exit	350 ft. (SSW)	46.4	57.7	58.0	11.6
#13	Lone Tree Creek and Pipeline HDD	Entry	250 ft. (NW)	45.9	73.9	73.9	28.0
		Exit	1,100 ft. (NNW)	45.9	46.6	49.3	3.4
#15	Farm Pond and CR 76 HDD	Entry	900 ft. (NE)	42.6	60.1	60.2	17.6
		Exit	500 ft. (SW)	42.6	52.5	52.9	10.3
#16	Eaton Ditch & Foreign Pipeline HDD	Entry	1,100 ft. (E)	42.7	54.6	54.9	12.2
		Exit	950 ft. (E)	42.7	46.2	47.8	5.1
#17	Eaton Ditch – 2 HDD	Entry	1,300 ft. (N)	44.1	53.9	54.3	10.2
		Exit	850 ft. (NE)	44.1	49.2	50.4	6.3
#18	Eaton Ditch – 3 HDD	Entry	700 ft. (NW)	44.5	62.7	62.7	18.2
		Exit	150 ft. (E)	44.5	66.8	66.8	22.3