Federal Energy Regulatory Commission

Office of Energy Projects

May 2019

Natural Gas Pipeline Company of America, LLC **Docket No. CP19-52-000**

Lockridge Extension Pipeline Project

Environmental Assessment

Washington, DC 20426

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 1
Natural Gas Pipeline Company of America
Lockridge Extension Pipeline Project
Docket No. CP19-52-000

TO THE INTERESTED PARTY:

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) for the Lockridge Extension Pipeline Project proposed by Natural Gas Pipeline Company of America (Natural) in the above-referenced docket. Natural requests authorization pursuant to section 7(c) of the Natural Gas Act (NGA), and part 157 of the Commission's regulations seeking authorization to construct, operate, and maintain facilities in Ward, Reeves, and Pecos Counties, Texas to directly connect Natural to the Waha Hub and transport up to 500 million cubic feet per day of natural gas to the Trans Pecos Pipeline header at the Waha Hub.

The EA assesses the potential environmental effects of construction and operation of the Lockridge Extension Pipeline Project in accordance with the requirements of the *National Environmental Policy Act* (NEPA). The FERC staff concludes that approval of the proposed Project, with the mitigation measures, would not constitute a major federal action significantly affecting the quality of the human environment.

The proposed project includes the following facilities:

- approximately 16.84 miles of new 30-inch-diameter pipeline;
- installation of ancillary piping and valves to interconnect the new pipeline extension;
- relocation of a 30-inch-diameter pig receiver to the southern terminus of the proposed pipeline extension; and
- installation of a new bidirectional interconnect and appurtenant facilities at the southern terminus of the proposed pipeline extension.

The Commission mailed a copy of the *Notice of Availability* 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 Project area. 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. CP19-52). 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 this project, it is important that we receive your comments in Washington, DC on or before 5:00pm Eastern Time on **July 1, 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 (CP19-52-000) 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 ABBREVIATIONS AND ACRONYMS

APE	Area of Potential Effects
API	American Petroleum Institute
AR	Access Road
ATWS	Additional Temporary Workspace
AQCR	Air Quality Control Regions
BEG	Bureau of Economic Geology
BGEPA	Bald and Golden Eagle Protection Act
BMPs	best management practices
CAA	Clean Air Act
CFR	Code of Federal Regulations
Certificate	Certificate of Public Convenience and Necessity
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
Commission	Federal Energy Regulatory Commission
CIAA	Cumulative Impact Assessment Area
CWA	Clean Water Act
dBA	decibels on the A-weighted scale
DOT	U.S. Department of Transportation
EA	Environmental Assessment
EI	Environmental Inspector
EGM	Electronic Gas Measurement
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
g	acceleration due to gravity
GHG	greenhouse gases
GIS	geographic information system
GCDs	Groundwater Conservation Districts
GWP	global warming potential
HAP	hazardous air pollutant
IPaC	Information for Planning and Consultation
L_{dn}	day-night sound level
L_{eq}	24-hour equivalent sound level
M	magnitude
MBTA	Migratory Bird Treaty Act
MMI	Modified Mercalli Intensity Scale

MP	milepost
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Proposed Lockridge Extension Project and Request for Comments on Environmental Issues*
NSA	Noise Sensitive Areas
NRHP	National Register of Historic Places
NRCS	Natural Resources Conservation Service
NSA	noise sensitive area
NWI	National Wetland Inventory
NWP	Nationwide Permit
OEP	Office of Energy Projects
PGA	peak ground acceleration
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan*
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
PM_{10}	Particulate Matter less than 10 microns in diameter
Procedures	FERC's *Wetland and Waterbody Construction and Mitigation Procedures*
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Officer
SPCC Plan	*Spill Prevention, Control, and Countermeasure Plan*
SO_2	sulfur dioxide
TCEQ	Texas Commission of Environmental Quality
TCP	Traditional Cultural Properties
TNRIS	Texas Natural Resources Information System
TPP	Trans Pecos Pipeline
TPWD	Texas Parks and Wildlife Department
TRRC	Railroad Commission of Texas
TWDB	Texas Water Development Board
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey

A: PROPOSED ACTION

The staff of the Federal Energy Regulatory Commission (Commission or FERC) prepared this environmental assessment (EA) to assess the environmental impacts of the proposed Lockridge Extension Pipeline Project (Project) proposed by Natural Gas Pipeline Company of America (Natural). We[1] prepared this EA in compliance with the requirements of the *National Environmental Policy Act of 1969* (NEPA), the Council on Environmental Quality regulations for implementing NEPA (Title 40 of the Code of Federal Regulations [CFR] 1500-1508 [40 CFR 1500-1508]), and the Commission's implementing regulations under 18 CFR 380.

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

1.0 INTRODUCTION

On January 18, 2019, Natural filed an application with the Commission in Docket No. CP19-52-000 pursuant to section 7(c) of the Natural Gas Act of 1938 (NGA), and part 157 of the Commission's regulations seeking authorization to construct, operate, and maintain 16.8 miles of new 30-inch-diamter pipeline extension in Ward, Reeves, and Pecos Counties, Texas, as well as two 10-inch-diameter meter runs and a 30-inch-diameter tap in Pecos County, Texas.

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

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

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

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

2.0 PROJECT PURPOSE AND NEED

Natural's stated purpose of the Project is to directly connect Natural to the Waha Hub and to transport up to 500 million cubic feet per day of natural gas to the Trans Pecos Pipeline (TPP) header at the Waha Hub. Specifically, the Project would provide new firm transportation service on its Permian System from an existing receipt point (Rojo Toro Lateral) on Natural's existing pipeline system to a proposed new bidirectional interconnect with TPP. Natural proposes to provide long-term firm transportation service to two shippers, Lucid Energy Delaware, LLC and EOG Resources, Inc. Natural's interstate pipeline system is currently not connected to the Waha Hub.

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

3.0 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

As the lead federal agency for the Project, FERC is required to comply with Section 7 of the Endangered Species Act (ESA) and Section 106 of the National Historic Preservation Act (NHPA). These statutes have been considered in the preparation of this EA. The Commission will use this document to consider the environmental impacts that could result if it authorizes the Project. In addition to FERC, other federal, state, and local agencies may use this EA for issuing permits for all or part of the proposed Project. Permits and approvals for the Project are discussed in section A.7.

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

3.1 Public Review and Comment

On March 1, 2019, we issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Lockridge Extension Project and Request for Comments on Environmental Issues* (NOI). The NOI was mailed to about 254 entities including federal, state, and local officials; Native American groups; agency representatives; potentially affected landowners and other interested individuals; and local libraries and newspapers. The NOI established a scoping period and requested comments on specific concerns about the Project or issues that should be considered during the preparation of the EA.

We received a total of 6 comment letters; one from an individual stakeholder concerned with induced seismicity from hydraulic fracturing in the Project area and with water quality impacts; two from tribes (Kickapoo Traditional Tribe of Texas and Delaware Nation Historic Preservation Department) stating that they do not currently have concerns with the Project; one from the Texas Parks and Wildlife Department recommending general construction best management practices; and one from the U.S. Department of Agriculture stating that pipelines are exempt from provision of the Farmland Protection Policy Act, but recommending erosion controls and topsoil conservation. All substantive comments received from stakeholders are addressed in this EA.

3.2 Proposed Facilities

The Project involves the construction and installation of 16.84-miles of new 30-inch-diameter pipeline starting in Ward County, Texas and crossing into Reeves County, Texas before it interconnects with the existing TPP header at the Waha Hub. Natural plans to locate about 91 percent of the extension pipeline parallel and adjacent to existing utility (pipeline and powerline) right-of-ways along the route. There would be no overlap of permanent right-of-ways between the Project and existing easements. However, the construction workspace for the proposed Project would overlap up to 10 feet, in certain areas, with existing permanent right-of-ways.

Appurtenant work proposed for the Project includes the installation of ancillary piping and valves to interconnect the new pipeline extension, and the relocation of a pig receiver[2] to the southern terminus of the Lockridge Pipeline. Natural would also install a new bidirectional interconnect at the southern terminus of the proposed pipeline extension. The bidirectional interconnect would consist of an unmanned graveled facility enclosed by chain link fence containing meters, flow control and pressure regulation valves, filter separator, and electronic gas measurement (EGM) facilities, two 30-inch-diameter tees, valves, and risers for potential future use, associated above and below ground piping, and valves to tie in to the proposed pipeline extension. The EGM

[2] A pipeline "pig" is a device used to clean or inspect the pipeline. A pig launcher/receiver is an aboveground facility where pigs are inserted or retrieved from the pipeline.

equipment would be housed in a building constructed on a poured concrete slab foundation. The relocated pig receiver would be located within the fenced new bidirectional interconnect facility.

The general location of the proposed Project facilities are shown on topographic route maps provided in appendix A.

4.0 LAND REQUIREMENTS

Construction of the Project would disturb about 341 acres of land for the construction of the pipeline extension and aboveground facilities. Following construction, Natural would maintain about 103 acres for permanent operation of the Project's facilities; the remaining acreage would be restored and revert to former uses. Land requirements for construction and for operation of the planned Project facilities are summarized on Table 1.

Table 1
Summary of Land Requirements

Facility	Land Affected During Construction (acres)[a]		Land Affected During Operation (acres)[d]
Pipeline Facilities			
	New[b]	**Existing[c]**	
Pipeline Extension	185.8	18.6	102.1
Additional Temporary Workspace	24.3	0.43	NA
Pipeline Facilities Subtotal	**210.1**	**19.0**	**102.1**
Aboveground Facilities			
	New	**Existing**	
Bidirectional Interconnect	2.1	NA	0.92
Contractor Yards	0	24.1	NA
Access Roads	0.02	85.5	0.02
Aboveground Facilities Subtotal	**2.1**	**109.6**	**0.04**
Project Total	**212.2**	**128.6**	**103.1**

a. Includes areas to be disturbed by construction. The pipeline extension includes a 100-foot-wide construction right-of-way (ROW). For access roads, includes the total acreage of existing roads.

b. For the 16.84-mile-long pipeline extension, "new" includes only new temporary ROW and excludes use of existing ROW for parallel and adjacent existing utilities.

c. For the 16.84-mile-long pipeline extension, "existing" includes existing ROW and excludes use of new temporary ROW. For yards, "existing" includes industrial areas.

d. Natural would use approximately 0.3 acre of its existing aboveground facilities for permanent operational ROW for the pipeline extension.

Natural has identified locations in the vicinity for use as contractor yards during construction of the Project comprising about 24 acres of existing industrial land use. Natural would use the contractor yards for temporary field offices; parking; equipment

storage and maintenance; pipe and materials storage and fabrication; soil storage; and hydrostatic test water discharge areas.

Natural would use existing public and private roads for temporary construction and permanent operation access to the Project right-of-way and aboveground facilities. Natural has inspected all the proposed access roads and has confirmed that these existing roads require no improvements, such as widening or culvert improvements/replacements; however, maintenance, including the addition of gravel on the existing road surfaces, may be required to fill potholes or improve areas where the gravel layer has been reduced due to normal use. No new temporary or permanent access road construction is proposed as part of Project construction. However, construction of a new access road (AR-3a) would be required for permanent operational access for the proposed Project. Planned access road AR-3a is 34 feet long and 20 feet wide and would connect with the bidirectional interconnect (see section B.5.1).

5.0 CONSTRUCTION SCHEDULE

Pending receipt of all necessary regulatory approvals, Natural plans to commence construction of the Project in March 2020. Construction of the Project would commence only after Natural has obtained the Commission's Certificate for the Project, all applicable federal, state, and local permits, and a Notice to Proceed with construction from the Commission. Natural anticipates placing all Project facilities in-service no later than the fourth quarter of 2020.

6.0 CONSTRUCTION, OPERATION, AND MAINTENANCE PROCEDURES

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

Natural estimates it would commence construction for the pipeline extension using one or more mainline construction spreads and various smaller tie-in crews for Project construction. The majority of Project construction activities would be conducted between the hours of 6:00 a.m. to 10:00 p.m.; however, weather conditions, site conditions, specialized construction techniques, emergencies, or other atypical circumstances may necessitate nighttime work or extended work on Sundays. Construction noise impacts on nearby residents are reviewed further in section B.7.2. The total construction workforce would vary depending on the phase of construction.

Natural would employ an anticipated peak workforce of approximately 150 personnel and would take approximately three months to complete the Project.

Natural would use conventional techniques for buried pipeline construction and would follow the requirements in our *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures)[3] to ensure safe, stable, and reliable transmission facilities consistent with Commission and DOT specifications. Natural has however requested modifications to our Procedures to accommodate usage of two Additional Temporary Workspace (ATWS) areas that are within 50-feet of a waterbody. Natural states that erosion control devices would be installed along the edge of the two ATWS, and construction equipment would not be parked or stored in the buffer area. No fuel storage, fuel transfer, oil change or hydraulic fluid additions would occur within 100 feet of any waterbody (see section B.3.2). We have reviewed this modification and find it acceptable.

Natural would notify affected landowners before the preconstruction surveys and staking commence. Following landowner notifications, a land survey crew would survey and stake the outside limits of the proposed construction right-of-way and Additional Temporary Workspace (ATWS) areas, the centerline of the pipeline, wetlands, streams, drainages, highway and railroad crossings, and access roads. Prior to the commencement of construction activities, Natural would contact the "Texas One Call" system, as well as the national "811" call system, to have underground utilities and third-party pipelines identified and marked. Natural would mark avoidance areas, such as wetland boundaries, cultural resource sites, and sensitive species habitat, with appropriate fencing or flagging based on agency approvals and permit conditions.

The construction corridor would be cleared and graded to remove brush, trees, roots, and other obstructions such as large rocks and stumps. Non-woody vegetation may be mowed to ground level. Natural would install temporary fences and gates as needed to restrict non-authorized access. Burning would only be allowed where the contractor has acquired all applicable permits and approvals (*e.g.*, agency and landowner). Chipped material not removed may be spread across the right-of-way within upland areas in a manner that does not inhibit revegetation. Wood chips would not be left within agricultural lands, wetlands, or within 50 feet of wetlands/streams.

Grading of the construction workspace would allow for the movement of heavy equipment and the safe passage of work crews. Grading would include removing rock outcrops, tree stumps, ridges, and topographic irregularities. Generally, machinery

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

would operate on one side of the trench (working side) with excavated materials stockpiled on the other (nonworking side). Grading activities would be scheduled to minimize the time between initial clearing operations and the actual installation of pipe.

To minimize impact on the soil profile on agricultural lands, up to 12 inches of topsoil would be segregated from subsoil and would remain segregated during construction to avoid loss due to mixing with subsoil material. Natural would utilize either full right-of-way topsoil segregation or ditch plus spoil side topsoil segregation in agricultural areas, as requested by the landowner, or as appropriate based upon site-specific conditions. Upon the completion of backfilling operations, the topsoil would be properly replaced over the graded area. Grading activities would be scheduled to minimize the time between initial clearing operations and the actual installation of pipe.

The trench for the pipeline would be excavated by crawler-mounted, rotary wheel-type trenching machines or track–mounted excavators. The trench generally would be approximately 14 inches wider than the diameter of the pipe and of sufficient depth to allow for the minimum cover requirements to the top of the pipe in accordance with DOT regulations pursuant to the Natural Gas Pipeline Safety Act of 1968. Landowner requests or permitting requirements may dictate greater depth.

Crossing of third-party pipelines would generally require the pipeline to be buried at greater depths depending upon the depth of the third-party pipeline. A minimum of 12 inches of clearance would be maintained when crossing third-party pipelines, utilities, or other structures. Pipeline burial depths in areas requiring special construction techniques through rock would be in accordance with DOT requirements, 49 C.F.R. Part 192. In accordance with our Plan, measures would be employed to minimize erosion during trenching operations and construction activities. Natural would also install trench breakers, slope breakers, and erosion control devices to minimize the free flow of water into the trench and through the trench into waterbodies.

The stringing operation involves delivering the pipe to the Project area's pipeline storage areas typically by truck and then moving the pipe by truck to the construction zone, where it would be placed along the right-of-way in a continuous line in preparation for subsequent lineup and welding operations. The amount of pipe necessary for wetland, stream, or road crossings would be stockpiled in pipeline storage areas in the vicinity of each crossing. Stringing activities would be coordinated with the trenching and pipe-laying crews to minimize the potential impact to the resources.

Once the pipeline has been welded together, coated and inspected, the pipe would be lowered into the trench. If the bottom of the trench is rocky, sandbags or support pillows at designated intervals along the trench may be used to minimize impacts on the pipe. Trench dewatering, may be required in certain locations to prevent the pipe from floating and to perform certain limited activities in the trench. If trench dewatering

activities are required, Natural would conduct these activities in accordance with our Plan and Procedures.

After lowering the pipe into the trench, Natural would backfill the trench. Backfill would consist of the material originally excavated from the trench, including rock to the existing rock profile; however, in some cases, additional backfill from other sources may be required. Any excess excavated materials or materials unsuitable for backfill would be disposed of in compliance with applicable regulations. In areas where topsoil has been segregated, the subsoil would be placed in the trench first and then the topsoil would be placed over the subsoil. Backfilling would occur to approximate grade, however, a soil crown may be placed above the trench to accommodate any future soil settlement.

After the completion of backfilling, disturbed areas would be graded, and any remaining trash and debris would be properly disposed of in compliance with federal, state, and local regulations. Natural would protect the construction corridor through the implementation of erosion control measures, including site-specific contouring, permanent slope breakers, mulching, and reseeding or sodding with soil-holding vegetation. If sufficient soils are not available, additional soil would be imported and inspected by Natural prior to use. Natural would restore the construction workspace in accordance with our Plan and Procedures, and with information regarding applicable seed mix requirements from the U.S. Department of Agriculture, National Resources Conservation Service (USDA/NRCS) and relevant landowner agreements.

6.1 Waterbody Crossing Construction

Natural would utilize either conventional open cut, dry flume, dam and pump, or wet open cut methods for installing the pipeline across waterbodies during construction.

Prior to initiating construction across the waterbody, the pipeline segment to be placed across the waterbody would be fabricated (*i.e.*, bent, welded, and coated). Excavators would then excavate a trench in the flowing waterbody from one or both banks of the waterbody. Where the waterbody is too wide to excavate the trench from the banks, it may become necessary for equipment to operate from within the waterbody. This would only be conducted with prior approval from appropriate regulatory agencies. Equipment operating within the waterbody would be limited to that needed to construct the crossing. During these operations, flow would be maintained at the crossing. Spoil excavated from the trench would be placed on the bank at least 10 feet from the edge of the waterbody or placed adjacent to the trench in the stream (manmade pond only, see section 3.2). Natural would then install the prefabricated segment of pipeline into the trench using sideboom tractors or similar equipment. Concrete coated or set-on bag or concrete weights, would be used as necessary to provide negative buoyancy for the

pipeline. Once the trench is backfilled, the banks would be restored as near as practicable to pre-construction contours and stabilized as previously described. Excavated material not required for backfill would be incorporated into the soil in an upland area for use as backfill.

6.2 Operation and Maintenance

Following construction of the pipeline, areas used for temporary workspace and ATWS would be allowed to revert to their preconstruction land use/land cover. A typical permanent right-of-way of 50 feet would be used for operation and maintenance of the new pipeline. Natural would conduct vegetation maintenance of its permanent right-of-way in upland areas at a frequency of about once every 5 to 7 years to maintain herbaceous to low scrub-shrub cover.

6.3 Non-Jurisdictional Facilities

There would be no non-jurisdictional facilities constructed as a result of the Project.

7.0 PERMITS, APPROVALS, AND REGULATORY CONSULTATIONS

Table 2 lists the major federal, state, and local permits, approvals, and consultations for construction and operation of the Project and provides the current status of each. Natural would be responsible for obtaining and abiding by all permits and approvals required for construction and operation of the Project regardless if they appear in the table.

Table 2.
Environmental Permits, Approvals and Regulatory Consultations

Regulatory Agency/ Organization	Permit/Approval	Date Submitted / *Anticipated Submittal*	Date Received / *Anticipated Receipt*
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity	January, 18 2019	*Pending*
U.S. Army Corps of Engineers, Albuquerque District	Section 404 of the Clean Water Act – Wetland and Waterbody Crossing Permit; Federal 401 Water Quality Certification	January, 11 2019	*August 29, 2019*

Table 2.
Environmental Permits, Approvals and Regulatory Consultations

Regulatory Agency/ Organization	Permit/Approval	Date Submitted / *Anticipated Submittal*	Date Received / *Anticipated Receipt*
U.S. Fish and Wildlife Service, Austin Ecological Field Services Office	Clearance under Section 7 the Endangered Species Act	January 11, 2019	*April 11, 2019 USFWS determined that the Project is not likely to affect federally-listed species Consultation Complete*
U.S. Fish and Wildlife Service, Austin Ecological Field Services Office	Project review under Migratory Bird Treaty Act	January 11, 2019	*August 29, 2019*
Advisory Council on Historic Preservation / Texas Historical Commission	Section 106, of the National Historic Preservation Act	May 15, 2018 updated on January 2, 2019	June 6, 2018 updated on January 28, 2019
U.S. Department of Agricultural – Natural Resources Conservation Service	Consultation regarding non-native invasive species plant list and restoration seed mix recommendations.	May 9, 2018	May 9, 2018
Railroad Commission of Texas and Texas Commission on Environmental Quality – Water Quality Division	State 401 Water Quality Certification	January 11, 2019	*August 29, 2019*
Texas General Land Office	Texas Natural Resources Code [“TNRC”] §51.291 – Miscellaneous Easement for Right-of- Way on State Submerged Lands	*First Quarter 2020*	*First Quarter 2020*
Railroad Commission of Texas	Hydrostatic Test Water Discharge	*May 2020*	*June 2020*
Texas Department of Transportation	Highway Occupancy Permit	*First Quarter 2020*	*First Quarter 2020*

Table 2.
Environmental Permits, Approvals and Regulatory Consultations

Regulatory Agency/ Organization	Permit/Approval	Date Submitted / *Anticipated Submittal*	Date Received / *Anticipated Receipt*
TPWD - Austin and Regional Wildlife Division	Chapter 86, subtitle F, of the Texas Parks and Wildlife Code Marl, Sand, Gravel, Shell or Mudshell Permit	*March 2020*	*April 2020*
TPWD – Austin and Regional Wildlife Division	Title 5 Sections 67.001 – 68.021, Texas Threatened and Endangered Species Regulations (amended 1977), Parks and Wildlife Code ("PWC"); Title 5 Sections 88.001 – 88.012, Texas Threatened and Endangered Species Regulations (amended 1977), Parks and Wildlife Code – informal consultation	April 4, 2018, updated January 11, 2019	May 17, 2018, *August 29, 2019*
Ward County	County Road Use Permit	*First Quarter 2020*	*First Quarter 2020*
Reeves County	County Road Use Permit	*First Quarter 2020*	*First Quarter 2020*
Pecos County	County Road Use Permit	*First Quarter 2020*	*First Quarter 2020*

B: ENVIRONMENTAL ANALYSIS

In the following sections, we address the affected environment, general construction and direct and indirect operational impacts, and proposed mitigation to minimize or avoid impacts for each resource.

When considering the environmental consequences of the Project, the duration and significance of any potential impacts are described below according to the following four levels: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction, with the resources returning to pre-construction conditions almost immediately. Short-term impacts could continue for up to three years following construction. Long-term impacts would require more than three years to recover, but eventually would recover to pre-construction conditions. Permanent impacts could occur because of activities that modify resources to the extent that they may not return to pre-construction conditions during the life of the Project, such as with the construction of an aboveground facility. An impact would be considered significant if it would result in a substantial adverse change in the physical environment. In the following sections, we address direct and indirect effects collectively, by resource. There would be no impact on the following resources:

- wetlands;
- national or state wild or scenic rivers;
- recreation or scenic places;
- state parks, nature preserves, national trails, wilderness areas, or registered landmarks;
- landfills, quarries, hazardous waste sites, or wastewater outfalls;
- residential areas or planned developments, or
- coastal zone management areas.

These resources will not be discussed further in this EA. Section B.9 of this EA analyzes the Project's contribution to cumulative impacts.

Natural, as part of its proposal, agreed to implement certain measures to reduce impacts on environmental resources. We evaluated the proposed mitigation measures to determine whether additional measures would be necessary to reduce impacts.

1.0 GEOLOGY

The Project is located in west Texas within the Toyah Basin section of the Great Plains Physiographic Province. Extensive stream-laid sand and gravel deposits, which contain the Ogallala aquifer, underlie the plains. Windblown sands and silts form thick, rich soils and caliche locally. The vast majority of the province is plateau-like with flat plains and little relief throughout, and covered with thick layers of alluvial material (Bureau of Economic Geology [BEG] 1996). Project elevation along the planned pipeline route ranges from about 2,500 feet to about 2,670 feet above mean sea level, with maximum slopes of about five percent, sloping toward the Pecos River.

During late Tertiary and Quaternary time, streams that flowed across the area laid down thick, extensive deposits of alluvium. The Project route crosses through six mapped surficial geologic units described below:

- *Alluvium:* Consists of alluvium deposited along streams, and sandy silts, locally modified by sheetwash action, and deposited during the Holocene epoch. Variable thickness comprised primarily of sand, some silt, and little amounts of clay, and gravel (U.S. Geological Survey [USGS] 2018a, Texas Natural Resources Information System [TNRIS] 2018). This geologic unit is mapped at the following mileposts (MPs): 7.95 to 8.35, 8.40 to 10.55, and 14.30 to 16.84.

- *Older Alluvial Deposits:* Consists mostly of boulders, cobbles, and pebbles of Cretaceous limestone and chert, locally overlain by brown silt, deposited in the Pleistocene epoch. Ranges from unconsolidated to partly consolidated by caliche cement; with grains composed of chert, quartzite, limestone, and volcanic rocks of vesicular, aphanitic, and porphyritic textures. The unit is comprised primarily of gravel, with some sand, and a little silt (USGS 2018a, TNRIS 2018). This geologic unit is mapped at the following MPs: 10.55 to 14.30.

- *Gatuna Formation:* Sand, marl, conglomerate, gypsum, silt, shale, and limestone, deposited in the Pleistocene epoch. Sand, fine to coarse, yellow, yellowish to reddish orange, brown, red, pink; locally with worn Cretaceous fossils (USGS 2018a, TNRIS 2018). This geologic unit is mapped at the following MPs: 7.70 to 7.95, and 8.35 to 8.40.

- *Terrace Deposits:* Gravel, sand, and silt, commonly with peddles and cobbles of chert, quartzite, igneous rock, metamorphic rock, caliche, and at higher levels abraded Gryphea. Deposited in the Pleistocene epoch, and locally indurated with calcium carbonate (caliche) in terraces along streams (USGS

2018a, TNRIS 2018). This geologic unit is mapped at the following MPs: 6.40 to 7.70.

- *Sand sheet deposits:* Windblown sand, areas of large dunes. Composed primarily of sand, with some silt. Locally modified by surface wash, and deposited in the Holocene epoch (USGS 2018a, TNRIS 2018). This geologic unit is mapped at the following MPs: 1.50 to 1.95, 2.20 to 2.35, and 3.65 to 6.40.

- *Caliche Deposits:* Chiefly pedogenic carbonate stripped of covering materials, thickness as much as 35 feet. Deposited in the Holocene and Pleistocene epochs (USGS 2018a, TNRIS 2018). This geologic unit is mapped at the following MPs: 0.00 to 1.50, 1.95 to 2.20, and 2.35 to 3.65.

1.1 Mineral Resources

The Project area is within the Worsham Oil Field and the Waha Oil Field in the Permian Basin. Most of this production comes from carbonate rocks of Permian age (BEG 2005). Active oil and gas wells are present throughout the Project area. A search of the Railroad Commission of Texas (TRRC) Public GIS Viewer and GIS dataset for oil and gas wells on record within 0.25-mile of the proposed pipeline extension resulted in a total of 71 well locations (TRRC 2018). Of the 71 wells identified, 32 are listed as active, 24 are listed as plugged and abandoned, 5 are listed as permitted, and 10 are listed as dry hole. Two active oil wells are within 100 feet of the right-of-way: one near MP 0.58 in Ward County, and the other near MP 12.05 in Reeves County.

Construction activities would only require shallow excavations for pipeline trenches and appurtenant and auxiliary facilities. Given the nature and extent of proposed construction activities for the Project, we do not anticipate that there would be an adverse impact on resource oil and gas extraction activities. Likewise, we do not anticipate any conflicts from the presence or extraction of mineral resources in the areas surrounding the Project that may affect construction or operation of the Project.

There are no coal mining operations in vicinity of the proposed Project area. The closest mapped coal belt is over 100 miles south of the Project (TRRC 2016). There are no underground mining operations near the proposed Project (USGS 2018b, USGS 2018c).

The presence of nonfuel mineral mines was also reviewed. Within 0.25-mile of the Project area, one unnamed gravel pit was identified, approximately 800 feet east of MP 12.20. No other mineral mines or mining prospects were identified (USGS 2018b, USGS 2018c). Therefore, we conclude that Project activities would not affect nonfuel mining operations.

We conclude that Project construction and/or operational would not result in significant impacts on fuel resources given the nature and extent of proposed construction activities (shallow trenching) for the Project, and the distance to the nearest of non-fuel resources.

1.2 Paleontology

Due to the thickness of the alluvial cover and depth to any potential fossil-bearing bedrock, it is unlikely that unique paleontological resources would be discovered during Project construction. Fossils of Gryphaea (bivalve mollusks) and worn Cretaceous fossils, could be potentially encountered within the terrace deposits (Qt) and Gatuna formation (Qg), respectively. However, the Gryphaea would be considered relatively common. Also, given the fluvial depositional environment it is unlikely that unique or whole specimens from the Cretaceous period would be encountered. In addition, no sedimentary rock outcrops were observed during field surveys of the Project. Therefore, we conclude no significant impacts on paleontological resources would occur as a result of the Project.

1.3 Geologic Hazards

Geologic hazards are naturally occurring physical conditions that may result in damage to land and property or injury to people. Within the Project area, these could potentially include seismic activity, soil liquefaction, landslides, flash flooding, and ground subsidence.

Since 1900, there have been 113 earthquakes with a magnitude (M) of 2.5 or higher on the Richter scale that have occurred within 100 miles of the Project. Of these, five earthquakes were M 4.0 or higher, but were greater than 50 miles from the Project (to the north, west, or south). The largest recorded earthquake, M 6.5, was about 82 miles to the southwest on the Texas-Chihuahua border region, and occurred in 1931 (USGS 2018d).

The USGS Earthquake Hazards Program's *2014 Long-term Model* for the Conterminous U.S. (USGS 2014a) shows earthquake ground motions for various probability levels across the United States. The USGS rates ground motions using peak ground acceleration, which is the maximum acceleration experienced during the course of an earthquake and is measured in units of acceleration due to gravity (g). The seismic map indicates that the Project is in an area with a low seismic hazard class rating: 0.06g–0.10g peak acceleration with a 2 percent probability of exceedance in 50 years; and 0.02g–0.03g peak acceleration with a 10 percent probability of exceedance in 50 years. An earthquake generating 0.10g would produce strong perceived shaking, but result in slight physical damage.

We received a comment from a Project stakeholder with concerns regarding the frequency of induced earthquake activities in the region due oil and gas development activities, hydraulic fracking, and pipeline integrity due to increased seismicity. Earthquake activity in parts of the Central and Eastern United States, including Texas, has significantly increased in recent years. The space and timing of these events indicate anthropogenic origins, principally driven by deep injection of wastewater that is co-produced with oil and gas production and disposed into underground injection wells.

There are four Class II underground injection disposal wells within 0.25 mile of the Project. All are associated with oil and natural gas production and permitted through the TRRC Underground Injection Control Program (TRRC 2019). The closest injection well, American Petroleum Institute (API) No. 38930257, is approximately 294 feet from the centerline and 189 feet from workspace at MP 13.78. Three of the wells inject fluids (e.g., brine/salt water, produced water, or wastewater from hydraulic fracturing) to a depth ranging from 5,964 to 8,267 feet into the Permian Cherry Canyon Formation. Injection/disposal well API No 47530291, approximately 941 feet from the nearest workspace at MP 6.27, injects fluids (e.g., brine/salt water) to a depth of 20,340 feet into the Atoka Formation of the Carboniferous period.

The USGS 2014 long-term model does not consider seismicity or earthquakes caused by human activities such as fluid injection or extraction. The USGS does however produce seismic maps that are based on short-term induced seismicity models for 2016, 2017, and 2018 (USGS 2016, 2017a, and 2018f), which include both induced or potentially induced earthquakes, associated with activities such as mining extraction or wastewater injection, and natural earthquakes. Comparison of the USGS short-term seismic maps for the years 2016 to 2018 with the 2014 long-term seismic map shows increased sensitivity for seismic activity in the area where the Project is located.

The USGS seismic map for 2016, 2017, and 2018, respectively indicates that the Project is located in an area with a seismic hazard class rating of:

- 0.27–0.35g peak acceleration, expressed as a fraction of standard gravity, for 1 percent probability of exceedance in 1 year (Peterson, et al. 2016);
- 20–30g peak acceleration, expressed in units of percent gravity, for 1 percent probability of exceedance in 1 year (Peterson, et al. 2017); and
- 0.05–0.1g peak acceleration with 1 percent probability of exceedance in 1 year (Peterson, et al. 2018).

The potential to experience minor damage due to ground shaking from natural or human-induced earthquakes was less than 1 percent in 2016, which would produce the same perceived shaking and physical damage as indicated for 2014 (USGS 2016). The potential damage due to ground shaking from natural or human-induced earthquakes

increased to 1–2 percent in 2017, which would produce very strong perceived shaking with moderate physical damage (USGS 2017a), and the potential damage due to ground shaking from natural or human-induced earthquakes remained at 1–2 percent in 2018, which would produce the same perceived shaking and physical damage as indicated for 2017 (USGS 2018f).

No known Quaternary faults (faults that are found at the Earth's surface and younger than 1.6 million years) were found underlying the Project area (USGS 2018e). The nearest Quaternary fault is about 92 miles west of the Project area.

In general, modern electric arc welded steel pipelines have not sustained damage during seismic events except due to permanent ground deformation (for example, due to fault displacement), or traveling ground-wave propagation greater than or equal to a Richter magnitude of 6 (Modified Mercalli Intensity Scale [MMI] VII).

Soil liquefaction is a phenomena associated with seismic activity in which saturated, non-cohesive soils temporarily lose their strength and liquefy (i.e., behave like a viscous liquid) when subjected to forces such as intense and prolonged ground shaking. Although the Project lies within an area of moderate seismicity, the conditions required to pose a risk of soil liquefaction are not generally present due to the deep water table, soil cementation, and mixed grain-size (USGS 1996).

To mitigate seismic hazards, all Project facilities would be built to meet or exceed the seismic design provisions of the Pipeline and Hazardous Materials Safety Administration (PHMSA), and applicable state and local guidelines. Based on the implementation of these pipeline construction measures and the magnitude and intensity of seismic activity in the region, including that from induced seismic activity, and the potential for soil liquefaction, we conclude the Project is not likely to be adversely impacted by future seismic incidents.

A landslide is the downslope movement of earth materials under the force of gravity due to natural or manmade causes. The risk of landslides in the west Texas Project area is low. As indicated from available USGS quadrangle maps of the Project area (USGS 1986), the terrain is flat, with maximum slopes of about five percent. In addition, based on available USGS landslide hazard maps, the Project area has low incidence and susceptibility for landslides (USGS 1982).

The Project would cross ephemeral waterbodies and the Pecos River. The planned pipeline extension route between the Big Valley Canal (MP 4.85) and the Pecos River (MP 7.70) is identified as a Zone A, special flood hazard area. Zone A is defined by the Federal Emergency Management Agency (FEMA), as subject to inundation by the 1-percent-annual-chance flood event. The area south of the Pecos River within the Project area was unmapped by FEMA's National Flood Hazard Layer (FEMA 2018). In west Texas, flash flooding has the potential to occur during or after large storm events

that produce extreme precipitation. Natural would implement mitigation measures during construction to prevent impacts due to a flash flooding including:

- monitoring of local weather conditions and forecasts during construction activities. In the event of forecasted heavy precipitation, Natural would move and stage equipment and supplies at greater distance from the stream banks;
- anchoring all equipment bridges and any additional timber matting in-place;
- installing and maintaining sediment filters along waterbody banks;
- maintaining sediment filters around spoil piles; and
- performing waterbody crossings during forecasted dry weather and low water levels.

Lastly, the proposed pipeline extension route would not cross areas considered susceptible to karst development, as mapped by USGS (USGS 2014b). Accordingly, the potential for karst features to present a geologic subsidence hazard or ground failure is considered to be low.

We conclude that construction and operation of the Project would not result in any significant impacts on geologic resources, and we conclude that geologic hazard impacts on the Project would likewise not be significant.

2.0 SOILS

Construction of the Project would disturb about 341 acres of land for the construction of the pipeline extension and aboveground facilities. Following construction, Natural would maintain about 103 acres for permanent operation of the Project's facilities. The primary potential impacts from construction would be temporary or minor disturbances that expose soils to potential risk of erosion, off right-of-way sedimentation, possible mixing of topsoil and subsoil. The limited agricultural use within the Project area would be temporarily disrupted, and drainage tile systems (if they exist) could be impacted. Construction also has the potential to affect revegetation and agricultural productivity, including soils rated as farmland of statewide importance. Approximately 50.5 acres of farmland of statewide importance would be impacted during construction of the Project's natural gas facilities. Construction could also result in compaction of soils from construction equipment in the work area, possible intermixing of topsoil and subsoil, loss of organic matter, deterioration of soil structure, and soil settling or slumping. Soil compaction can lead to increased runoff and adversely affect agricultural crop production.

The soils that would be crossed by the Project do not generally pose any severe limitations for construction, and Natural would take steps to mitigate for any limitations, such as areas susceptible to erosion and soil compaction.

No soil units that would be crossed by the pipeline extension have a shallow depth to bedrock. However, soil units do exist that have the presence of a petrocalcic horizon between 7 and 20 inches. This layer could make excavation difficult and more time-intensive, but blasting is not normally necessary. Therefore, Natural anticipates that blasting techniques would not be required during construction of the pipeline extension. However, if blasting were to occur, Natural would develop and file a Project-specific blasting plan.

All Project soils have a slight erosion potential for off-road or off-trail erosion. A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions, and a slight to high susceptibility to wind erosion (USDA/NRCS 2018). Project soils are rated between 2 and 8 on a scale from 1 to 8, where 1 indicates the wind erodibility group most susceptible to wind erosion.

Soil erosion would be controlled by following the standard practices to prevent erosion and sedimentation in accordance with our Plan and Procedures (FERC 2013b). Because the Project is in an area with only slight erosion potential, Natural's commitment to implement mitigation measures, including our Plan and Procedures, we conclude that there would be no significant impacts on soils. Additionally, Natural would allow agricultural practices to continue on the construction and permanent rights-of-way following construction (excluding aboveground facilities).

3.0 WATER RESOURCES

3.1 Groundwater

The Project overlays one major aquifer, the Pecos Valley Aquifer (Texas Water Development Board [TWDB] 2014). The Pecos Valley Aquifer is a 6,829 square mile, unconfined, alluvial aquifer (TWDB 2011). Waterbearing sediments, which include alluvial and windblown deposits from the Pecos River Valley, fill these basins to a thickness that varies from less than 500 feet to approximately 1,500 feet, with the freshwater saturated thickness averaging approximately 250 feet (TWDB 2011). Although recognized as an unconfined aquifer, deeper sections of the Pecos Valley Aquifer may have confining clay beds that can create localized artesian conditions (TWDB 2012). Depth to the water table ranges from less than 50 feet around the aquifer's periphery to approximately 300 feet in sections of the irrigation areas of Reeves and Pecos Counties (TWDB 1990). More than 80 percent of groundwater pumped from the aquifer is used for irrigation, whereas the remainder is withdrawn for municipal supplies, industrial use, and power generation (TWDB 2011). Recharge to the aquifer is

derived principally from precipitation and irrigation return flow. Historically, water-level declines greater than 200 feet have occurred in south-central Reeves and north-west Pecos counties, but have moderated since the mid-1970s. Water quality in the aquifer is highly variable, and is dependent on location and depth (the quality tends to deteriorate with depth) (TWDB 1990). The water typically varies between hard and very hard, and high levels of chloride and sulfate (due to previous oil field activities) as well as naturally occurring arsenic and radionuclides occur in excess of primary drinking water standards (TWDB 2011).

Sole Source Aquifers and Wellhead Protection Areas

The Project is not within the vicinity of any U.S. Environmental Protection Agency (USEPA) designated sole source aquifers or wellhead protections areas (USEPA 2017a). The nearest sole source aquifer, the Edwards Aquifer is approximately 206 miles southeast of the southern terminus of the Project area in Pecos County, Texas (USEPA 2017a). Therefore, we conclude the Project has no potential to impact this sole-source aquifer.

Groundwater Use

Groundwater in Texas is the property of the landowner and is governed by the "rule of capture" which essentially provides that once the groundwater has been captured by a well and produced to the surface, it becomes the property of the landowner (Texas Commission of Environmental Quality [TCEQ] 2018a). The state manages and regulates groundwater use through groundwater management areas (GMAs) and groundwater conservation districts (GCDs). There are 16 GMAs in Texas, and each GMA consists of one or more GCDs within its boundaries (TWDB 2018a). The Project is within GMA 3, and there are two GCDs within this GMA: the Reeves County GCD and the Middle Pecos GCD. The portion of the Project area that is within Ward County, Texas is not in a GCD and therefore is governed by the "rule of capture" (TWDB 2018a, TCEQ 2018a).

Natural conducted a desktop and field review to identify existing public and private water supply wells within 150 feet of the proposed Project. Specifically, Natural consulted the TWDB and TCEQ databases (TWDB 2018b, 2018c; TCEQ 2012, 2016a), which contains information registered by well drillers for all types of wells. Natural also conducted in-field civil survey to further identify or confirm the locations of existing public and private water supply wells.

A total of two private brackish groundwater wells were identified within 150 feet of the pipeline extension's proposed construction workspace. The wells were identified in the TWDB and TCEQ databases as well as during in-field civil and environmental field surveys. One well is outside of the proposed Project construction workspace, whereas one well is within the Project construction workspace approximately 21 feet

south of the proposed pipeline centerline near milepost 16.36 in Pecos County. No public or private groundwater wells were identified within 150 feet of the proposed bidirectional interconnect Contractor Yard No. 1 or Contractor Yard No. 2. One private groundwater well was identified approximately 25 feet east of proposed Access Road (AR) No. 7 in Reeves County. AR-7 is an existing AR and would not require improvements (widening or culvert upgrades); therefore, impacts on the well from earth disturbing activities during construction is unlikely.

For all identified water supply wells within 150 feet of the construction work areas, Natural would conduct pre-construction well water testing to document water quality and flow in accordance with the measures identified in its draft Water Well and Spring Testing Program,[4] in order to establish a baseline for comparison in the unlikely event of well impacts.

Pipeline construction activities could potentially affect groundwater resources; however, most potential impacts would be avoided or minimized by the use of both standard and specialized construction techniques. Shallow aquifers could sustain minor impacts from changes in overland water flow and recharge caused by clearing and grading of the proposed right-of-way. In addition, near-surface soil compaction caused by heavy construction vehicles could reduce the soil's ability to absorb water. However, this effect would be minor and localized. The Project would be constructed in accordance with applicable environmental regulations, permits, and approvals and our Plan, which includes decompaction requirements for agricultural and residential areas. Additionally, construction methods would be consistent with industry-recognized practices and best management practices (BMPs) for construction.

Natural anticipates that shallow bedrock and boulders would generally be removed using mechanical equipment, such as hydraulic excavators, rock-ditching machines, dozer drawn rippers, or other in lieu of blasting. While Natural does not anticipate the need for blasting, should it be necessary, Natural would implement blasting controls to limit stresses on existing pipelines that parallel the Project area, as well as other nearby facilities, structures, and wells (private and municipal). All blasting activity would be performed according to strict guidelines designed to control energy release.

Dewatering of the pipeline trench may be necessary in areas where there is a high water table or during periods of excessive precipitation. However, any lowering of localized groundwater is expected to be temporary, and dewatering activities would be performed in accordance with Natural's BMPs and all applicable federal and state permits obtained for the Project. To recharge the aquifer and prevent silt-laden waters from flowing into streams and wetlands, Natural would discharge water from

[4] Natural Gas Pipeline Company Draft Water Well and Spring Testing Program December 2018 (Project Docket CP19-52-000; Accession Number 20190118-5059).

dewatering activities into adjacent, stable, well-vegetated upland areas. If selected dewatering locations are not within or immediately adjacent to the construction right-of-way, they would be sited to minimize off right-of-way impacts.

Potential Project-related groundwater contamination sources would include heavy equipment fuel, lubrication oil, or hydraulic oil spills. During construction, Natural would implement preventative measures to avoid such spills. During construction, Natural would utilize spill prevention control and countermeasures to avoid impacts on groundwater resources, including refueling restrictions and BMPs identified in the Project's Spill Prevention, Control, and Countermeasures Plan.

As discussed, Natural anticipates that it would obtain source water for construction from a commercial or municipal source, and groundwater usage is not planned for operation of the Project. Natural would implement its Draft Water Well and Spring Testing Program, to monitor wells within 150 feet of construction workspace before and after construction, and would implement the measures contained in its draft Spill Prevention, Control, and Countermeasure Plan should an accidental release of fuel, lubrication oil, or hydraulic oil were to occur during construction. With implementation of the above construction mitigation measures and its Water Well and Spring Testing, and its Spill Prevention Plans, the Project would not result in any significant impacts on groundwater resources or use of groundwater in the Project area.

3.2 Surface Water Resources

The proposed pipeline would cross a total of nine waterbodies. Of the nine waterbody crossings within the Project area, the Pecos River is the only perennial waterbody crossed by the Project. The Pecos River has been identified as having the capacity to support aquatic wildlife, such as invertebrates, amphibians, and waterfowl.

All waterbodies identified within the Project area are in the Rio Grande Basin, Upper Pecos River Region (TCEQ 2018b). No waterbodies have been identified at the proposed bidirectional interconnect, or Contractor Yards No. 1 and No. 2. All access roads are existing and would not require improvements (widening or culvert upgrades) prior to construction.

The waterbodies crossed by the proposed Project pipeline are summarized in table 3 along with the planned crossing method.

Table 3. Waterbodies Crossed by the Project

Milepost	Waterbody Name	Flow Regime	Width (feet)	State Water Quality Classification	County	Crossing Method
0.61	Manmade Pond	Ephemeral	230	Unclassified	Ward	Open-cut
5.36	Big Valley Canal	Ephemeral Canal	15	Unclassified	Ward	Open-cut
6.78	Unnamed canal	Ephemeral Canal	10	Unclassified	Ward	Open-cut
7.69	Pecos River	Perennial	45	Classified; Segment 2311	Ward/ Reeves	Dry Open-cut
8.13	Unnamed stream	Ephemeral	1	Unclassified	Reeves	Open-cut
8.17	Unnamed stream	Ephemeral	1	Unclassified	Reeves	Open-cut
8.48	Unnamed stream	Ephemeral	2	Unclassified	Reeves	Open-cut
8.51	Blake Draw	Ephemeral	2	Unclassified	Reeves	Open-cut
8.53	Blake Draw	Ephemeral	2	Unclassified	Reeves	Open-cut
AR-9	Big Valley Canal	Ephemeral Canal	20	Unclassified	Ward	Existing crossing

The identified flow regime is the result of field surveys documented in Natural's Wetland and Waterbody Determination and Delineation Report (and may vary from flow regime indicated on USGS 7.5-minute topographic maps.

Open cut = conventional open trench construction method; AR = access road.

Dry open-cut crossing of a stream directs the flow of a stream through an alternate mechanism to allow for the trenching and pipe installation to occur in dry conditions.

During construction, a nominal construction workspace totaling 100 feet in width would be required. To minimize impacts on undisturbed areas/resources, Natural plans to parallel approximately 91 percent of the pipeline to existing utility (pipeline and powerline) right-of-way to the extent that is practicable, feasible, and in compliance with existing law.

Construction of the Project across waterbodies would result in minor, short-term impacts. Temporary sedimentation and turbidity may occur as a result of in-stream construction, trench dewatering, and soil erosion along the construction right-of-way. In slowly moving waters, increases in suspended sediment may increase the biochemical oxygen demand and reduce levels of dissolved oxygen in localized areas during construction. Motile organisms may avoid these areas, but sessile and planktonic organisms may be adversely affected. Suspended sediments would also alter the chemical and physical characteristics of the water column (*e.g.,* color and clarity) on a short-term basis. However, Natural would install and maintain erosion and sedimentation controls in accordance with our Plan and Procedures to minimize impacts waterbodies.

If any stream is dry or has no perceptible flow at the time of construction, Natural would employ an open-cut crossing method. Natural anticipates that the Project's

ephemeral waterbodies would be crossed using a conventional open trench construction method. The Pecos River, the only perennial waterbody along the Project alignment, would be crossed by a dry crossing method whereby flumes and/or pumps would be utilized to temporarily re-direct the flow of the stream around the work area to allow for the trenching and pipe installation to occur in dry conditions. Where practical, this allows for drier trenching, pipe installation, and restoration while maintaining continuous downstream flow.

For siting ATWS, a riparian buffer of 50 feet (from top of bank) on both sides of a stream would be maintained wherever possible. However, based on existing site conditions (foreign pipeline crossings), Natural has identified and provided justification for two ATWS areas within Reeves County (MP 8.10 and 8.15; S13A and S14A, respectively) that are within the 50-foot buffer from a waterbody required in our Procedures. Construction equipment would not be parked or stored in the buffer area. No fuel storage, fuel transfer, oil change or hydraulic fluid additions would occur within 100 feet of any waterbody where possible. Natural would install erosion control devices along the edge of the two ATWS that are within the 50-foot buffer zone.

At small streams encountered along the right-of-way, a backhoe, dragline, or similar equipment would be used for trench excavation. The completion of all in-stream construction disturbance activities (not including blasting and other rock breaking measures) would not exceed 24 hours at minor stream crossings ($\leq$10 feet wide) and 48 hours at intermediate stream crossings (10–100 feet wide).

Stream crossings would be perpendicular to stream flow, to the extent practical. If necessary, the pipe used for stream crossings and in floodplains would be weighted to prevent flotation. Natural would weld the pipe together in the construction workspace and then carry or float it along the right-of-way into place. If the streambed is composed of unconsolidated material, the pipe would be pulled into place. In rock-bottomed streams, the pipe would be floated or lifted across and then lowered into place. After the pipe is lowered into the trench, Natural would return the previously excavated material to the trench line for backfill. Stream flow would be maintained at all waterbody crossings.

Natural would restore streambeds and banks to their former elevations and contours. Spoil, debris, sandbags, flume pipes, and construction materials would be removed to prevent interference with normal water flow and use. Natural would dispose of any excess excavated materials as approved by landowner or land management agency, or in compliance with applicable regulations.

With implementation of our Plan and Procedures for crossing project waterbodies, we conclude that impacts on surface water resources would be minor and temporary and would not be significant.

Additionally, section 404 of the Clean Water Act (CWA) authorization from the U.S. Army Corps of Engineers (USACE) would be required for dredge and fill activities associated with construction and waterbodies that are jurisdictional waters of the United States. Section 401 of the CWA water quality certification also would be required from TRRC/TCEQ for all stream crossings. Natural would obtain all required permits, including those directly applicable to water resources from the USACE, TRRC, and TCEQ, prior to initiating construction activities across any waterbodies.

3.3 Water Use

Each new pipeline section would be hydrostatically tested to ensure it conforms to Natural's and PHMSA's specifications before being placed into service. Testing would be performed in accordance 49 CFR 192. Environmental impacts from withdrawal and discharge of test water would be minimized by utilizing the measures outlined in our Plan and Procedures. Natural anticipates a total volume of 3,150,000 gallons of water sourced commercially for use as hydrostatic test water.

Hydrostatic test water would not be obtained from, or discharged to, state classified streams unless approved by TCEQ. No chemical additives or biocides would be used while testing the pipeline. Should it be determined that additives are necessary based on the source and composition of the test water, Natural would submit detailed information on any chemicals to the TCEQ for review and approval prior to use. Natural would minimize potential impacts from test water discharge by sequentially reusing the test water for multiple segments of the pipeline. The test water would be discharged in a stable, upland area and through energy-dissipating devices. As a result of Natural's adherence to these procedures, we conclude no adverse impacts on waterbodies would occur from hydrostatic test water discharge activities.

Discharge of wastewater to uplands or surface waters resulting from the hydrostatic testing of natural gas, crude oil, or other pipelines, tanks or other vessels requires a permit from the TRRC (TRRC 2018). Natural anticipates filing applications with state agencies for hydrostatic testing, as needed.

Natural has developed a Draft Fugitive Dust Control Plan to address potential impacts from fugitive dust. The objective of this Draft Fugitive Dust Control Plan is to identify potential dust emission sources associated with the Project, and to provide guidance to construction and field personnel on measures to control the generation of fugitive dust during construction activities associated with the Project.[5] During construction, Natural anticipates using water obtained from local commercial water

[5] Natural Gas Pipeline Company Draft Fugitive Dust Control Plan December 2018 (Project Docket CP19-52-000; Accession Number 20190118-5059).

suppliers or municipal sources for dust suppression. A total volume of 1.3 million gallons of water is anticipated for dust control during Project construction.

Considering the planned volume, source of water use during construction, and the measures that would be implemented to reduce impacts to aquatic organisms; and the mitigation measure used for the discharge of hydrostatic test waters, we conclude that environmental impacts during construction of Project facilities would be minimal.

4.0 FISHERIES, VEGETATION, AND WILDLIFE

Fisheries

As previously discussed in section 3.2, the Pecos River is the only perennial waterbody and the only one that has been identified as having the capacity to support aquatic wildlife, such as invertebrates, amphibians, fish, and waterfowl. The Texas Parks and Wildlife Department (TPWD) classifies the Pecos River as a warm-water fishery. The Project does not cross any essential fish habitat.

Natural has proposed to cross the Pecos River using the dry open-cut method. Project construction may increase siltation and turbidity in stream, which may degrade fish spawning and nursery areas, resulting in a temporary reduction in reproductive potential. Construction activities could disturb and suspend existing sediments in the waterbody, temporarily degrading water quality and redistributing contaminants downstream. This could impact aquatic and benthic species and downstream water uses. Removal of streamside vegetation at the pipeline crossing may reduce shading of the stream, and eliminate escape cover

The extent of the impact depends on sediment loads, stream velocity, turbulence, stream bank composition, and sediment particle size. Additionally, there is a slight potential of altering the geomorphology of the stream due to scour. The potential for fuel spills from storage containers, equipment working in or near streams, and fuel transfers could also occur. Any spills of hydrocarbon fuels would be detrimental to the water quality of the stream.

Impacts from construction would be temporary in nature as sediments are flushed during subsequent storm events, and aquatic communities would return to the affected area. Maintenance would occur within the permanent operational right-of-way; however, vegetation would be allowed to grow within the 25-foot riparian area to pre-construction conditions with the exception of a 10-foot herbaceous corridor centered on the pipeline.

The TPWD recommended that Natural implement BMPs to avoid and minimize potential impacts during crossing of waterbodies. Natural would implement the appropriate BMPs recommended by TPWD, including its SPCC plan, and our Plan and

Procedures to mitigate and avoid impacts on fisheries. These measures include (but are not limited to):

- conducting in-stream construction between June 1 through November 30;
- using sediment barriers across the entire construction right-of-way to prevent silt laden spoil from flowing back into the Pecos River and to contain and minimize turbid waters downstream of the crossing;
- maintaining stream flow during in-stream construction;
- refueling of mobile equipment outside of 100 feet from the river;
- using upstream and downstream structures (e.g., aqua dam, jersey barriers, sand bags, steel plate) to isolate the Project workspace; and
- allowing banks to revegetate, thus re-establishing woody and herbaceous vegetation species along the river bank that will provide cover habitat and shading.

Given Natural's construction measures to minimize direct impacts on surface waterbodies by implementing its SPCC, BMPs, and FERC's Plan and Procedures, we conclude impacts on fisheries would be temporary and not significant.

Vegetation

The proposed Project occurs within the Chihuahuan Desert, and generally consists of desert grassland, and arid shrubland. The Project would cross vegetation types including existing right-of-way, developed land, creosote bush, mixed desert, thorn scrub, mesquite upland scrub, and mixed desert shrub steppe.

No vegetation communities of special concern or unique or significant habitats such as state game lands, wildlife refuges, and wildlife management areas are anticipated to be within Project workspaces. During Project operation, the 99.3 acres of vegetation within the permanent right-of-way would be allowed to revegetation. However 0.9 acre of vegetation would be permanently removed for operation of the aboveground facilities. The vegetation types impacted by the Project are quantified in table 4.

Table 4 Vegetation Types Impacted by the Project			
Facility	**Vegetation/Land Use Type**	**Construction Workspace (acres)[a]**	**New Permanent Impacts/Right-of-way (acres)**
Pipeline Extension	Creosote Bush, Mixed Desert, and Thornscrub	101.9	46.9
	Easement (*i.e.*, existing utility right-of-way)	22.6	8.9
	Mixed Desert Shrub Steppe	67.3	30.1
	Mesquite Upland Scrub	28.5	12.7
	Waterbody (*i.e.*, man-made pond)	0.8	0.4
	Waterway (*i.e.*, ephemeral streams and the Pecos River)	0.5	0.3
	Total Pipeline	**221.6**	**99.3**
Bidirectional Interconnect	Creosote Bush, Mixed Desert, and Thornscrub	1.9	0.9
	Total Bidirectional Interconnect	**1.9**	**0.9**
Contractor Yards	Easement	<0.1	0.0
	Mesquite Upland Scrub	7.3	0.0
	Total Contractor Yards	**7.4**	**0.0**
Access Roads			
	Creosote Bush, Mixed Desert, and Thornscrub	<0.1	<0.1
	Total Access Roads	**<0.1**	**<0.1**
	Project Total	**231.0**	**100.2**

Vegetation impacts within habitats in the construction workspace and ATWS would be short-term, as these habitats would be allowed to revert to pre-construction conditions. The permanent operational right-of-way would remain in an herbaceous state through regular maintenance for the life of the Project. Impacts on shrub-scrub and/or herbaceous habitats during the operation of the Project would be temporary, and revegetate within a few growing seasons as Natural would also restore to these habitats to pre-construction conditions. No forested communities would be crossed by the Project.

Natural has proposed to locate 91 percent of the pipeline parallel and adjacent to existing utility (pipeline and powerline) rights-of-way to the extent practicable to minimize impacts on vegetation.

Natural would use erosion and sediment control measures during construction and operation, and ensure topsoil remains intact and distinct from the subsoil for replacement in agricultural areas, residential areas, and at the request of the landowner during clean-up activities. These measures would also allow Natural to maintain the soil integrity in impacted areas and contribute to the overall success of revegetation efforts.

Following lowering-in and backfilling, Natural would also remove excess rock and construction debris; restore pre-construction contours; perform decompaction as necessary; reinstall and maintain appropriate temporary erosion control measures; and reseed the disturbed areas as specified in accordance with recommendations from the Natural Resources Conservation Service (NRCS).

Natural would implement the preventive measures described in its draft Noxious and Invasive Weed Control Plan to identify and minimize the establishment and spread of noxious weeds during ground-disturbing activities associated with construction of the proposed Project. Some of these measures include providing training prior to construction, identifying and flagging any invasive species by Natural's environmental inspector, and monitoring for any invasive species after construction.

Given the amount of proposed parallel and adjacent rights-of-way and limited long-term impact, along with implementation of restoration methods outlined in our Plan and Procedures, we conclude that the Project would have mostly short-term and not have significant impacts on vegetation.

Wildlife

Mammal species commonly found in the Project area include bighorn sheep, mule deer, white-tailed deer, pronghorn, coyote, bobcat, collard peccary, and black-tailed jackrabbit. Common bird species in the Chihuahuan Desert include Montezuma quail, scaled quail, bobwhite quail, mourning dove, turkey, and black-throated sparrow. Common reptilian species include the western diamondback rattlesnake, blacktail rattlesnake, prairie rattlesnake, and desert massasauga.

Potential impacts on wildlife include habitat removal, construction-related ground disturbance, and noise. Some individuals could be inadvertently injured or killed by construction equipment. However, more mobile species such as birds and larger mammals would likely relocate to other nearby suitable habitat and avoid the Project area once construction activities commence. Noise levels along the proposed pipelines would return to pre-construction levels immediately following completion of construction activities.

The disturbance of local habitat is not expected to have population-level effects on wildlife because the amount of habitat that would be crossed represents only a small portion of the habitat available to wildlife throughout the Project area, and much of the disturbed habitat would return to pre-construction conditions following construction. Long-term impacts from habitat alteration would be further minimized by the amount of colocation proposed by Natural and the implementation of our Plan and Procedures, which would ensure revegetation of all areas temporarily disturbed by construction. Individual wildlife species are expected to reoccupy Project habitats following completion of construction activities.

Given the abundance of similar habitat adjacent to the Project area, Natural's proposed colocation for the majority of the route (thereby minimizing long-term habitat impacts) and its commitment to revegetate all areas temporarily disturbed by construction, we conclude that the Project would not have a significant impact on wildlife

or wildlife habitat in the Project area.

Migratory Birds

Migratory birds are species that nest in the U.S. and Canada during the summer and then migrate to and from the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act ([MBTA] – 16 U.S. Code [U.S.C] 703-711), and Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act ([BGEPA] – 16 U.S Code 668-668d). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Executive Order (EO) 13186 was enacted in 2001 to, among other things, ensure that environmental analyses of federal actions evaluate the impacts of actions on migratory birds. EO 13186 directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and avoid, minimize, or mitigate adverse impacts on migratory birds through enhanced collaboration with the USFWS, and emphasizes species of concern, priority habitats, and key risk factors, with particular focus given to population-level impacts.

On March 30, 2011, the USFWS and FERC entered into a Memorandum of Understanding between the Commission and the USFWS regarding implementation of EO 13186, that focuses on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the two agencies. This memorandum does not waive legal requirements under the MBTA, BGEPA, the ESA, or any other statutes, and does not authorize the take of migratory birds.

A variety of migratory bird species, including songbirds and raptors use the habitat in the Project area. The USFWS-established Birds of Conservation Concern (BCC) lists migratory nongame birds that, without additional conservation actions, were likely to become candidates for listing under the ESA (USFWS 2008). The Project is within the Bird Conservation Region (BCR) 35 under the Chihuahuan Desert. Table 5 lists the migratory bird species identified by the USFWS within this BCR.

Table 5
Migratory Birds in the Project Area

Common Name	Breeding Season
Baird's sparrow	Breeds elsewhere
Bald eagle	October 15 – July 31
Black-throated sparrow	March 15 – July 31
Burrowing owl	March 15 – August 31
Cassin's sparrow	August 1 – October 10
Chestnut-collared longspur	Breeds elsewhere
Golden eagle	December 1 – August 20
Grace's warbler	May 20 – August 20

Table 5 Migratory Birds in the Project Area	
Common Name	Breeding Season
Gray vireo	May 10 – August 15
Lark bunting	May 10 – August 15
Lesser yellowlegs	Breeds elsewhere
Long-billed curlew	Breeds elsewhere
McCown's longspur	Breeds elsewhere
Willowflycatcher	May 20 – August 15

Some indirect impacts caused by construction activity and noise could occur during the construction period. Some individuals may leave the Project area as construction activities commence and relocate to available habitat nearby. The general nesting season for migratory birds is April 15 to August 1. Vegetation clearing is anticipated to occur during prime migratory bird nesting season; therefore, Natural has committed to assigning one full-time biologist to monitor and observe construction work areas for active migratory bird nests and the presence of active burrows with the potential for the presence of western burrowing owls no more than 15 days prior to the start of clearing activities during the migratory bird nesting season. If active nests are identified, nesting activity would be monitored by the biologist. Should eggs and/or young birds be within the right-of-way to be cleared, Natural would coordinate with local licensed bird rehabilitation facilities to facilitate removal in accordance USFWS Memorandum MBPM-2 dated June 14, 2018. One raptor nest was identified on the proposed right-of-way during field surveys in April, November, and December 2018. However, no eagle nests were identified within 660 feet of the proposed project area.

Given the amount of collocated workspaces, ample adjacent habitats suitable for birds that may be disturbed, and Natural's commitment to observe construction workspaces for migratory birds, we conclude that the Project would not significantly impact migratory birds or eagles.

Federally Listed Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the *Endangered Species Act of 1973*, as amended, and those species that are state-listed as endangered or threatened. Section 7 of the ESA requires that the lead federal agency ensures that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. FERC, as the lead federal agency for NEPA review of the Project, is required to consult with the USFWS to determine whether any federally listed endangered or threatened species or any of their designated critical habitat are near the Project and to determine the proposed

action's potential effects on those species or critical habitats. If FERC determines that the Project would have no effect on a listed species, no further consultation with the USFWS is required.

Natural, acting as our non-federal representative for the purpose of complying with Section 7(a)(2) of the ESA, completed informal consultation with the USFWS, and the TPWD regarding federal and state-listed species with the potential to be affected by the Project. Table B-1 in appendix B lists the federal- and state-listed threatened and endangered species and special concern species that have the potential to occur within the Project area, including their status, and county of occurrence.

According to a USFWS, Information for Planning and Consultation (IPaC) search conducted May 2018 and December 2018, 20 federally listed species were identified as potentially occurring within the Project area. The USFWS has designated final critical habitat for 13 of these 20 federally listed species. None of these final designated critical habitats would be within the Project area (the closest one is 20 miles away). Therefore, the proposed Project would have *no effect* on critical habitat and we will not discuss these critical habitats further.

Natural conducted in-field pedestrian surveys of potential habitat for these 20 species from April 3, 2018 to April 12, 2018; from November 27, 2018 to November 30, 2018; and on December 7, 2018. The surveys did not identify potentially suitable habitat for 18 of the 20 iPaC-listed species. Because there is no suitable habitat for these species in the Project area, we conclude that the Project would have *no effect* on the federally endangered interior least tern, Comanche Springs pupfish, Leon Springs pupfish, Pecos gambusia, Rio Grande silvery minnow, diminutive amphipod, Pecos amphipod, diamond tryonia, Gonzales tryonia, Pecos assiminia snail, phantom springsnail, phantom tryonia and Texas hornshell, the federally threatened Mexican spotted owl, piping plover, red knot, Lloyd's mariposa cactus, or Pecos sunflower. Therefore, consultation for these species is complete and we will not discuss these species further.

The federally endangered gray wolf has potentially suitable habitat in the Project area, but the USFWS considers this species extirpated in Texas, therefore we conclude that there would be *no effect* on the gray wolf, and consultation for this species is complete.

The federally endangered northern aplomado falcon could potentially use mesquite habitat within the proposed Project area. This species is found in open country, especially savanna and open woodland, and sometimes in very barren areas; grassy plains and valleys with scattered mesquite, yucca, and cactus; nests in old stick nests of other bird species. Based on northern aplomado falcons potentially occurring with the Project area and the species' ability to relocate to nearby similar suitable habitat if disturbed, we conclude that the Project area contains suitable habitat for this species. However, the USFWS clarifies that the Project "counties were part of the historic range but currently, there are no known Aplomado falcons near the Lockridge Ext. project." Therefore, we

conclude that the Project *is not likely to adversely affect* the northern aplomado falcon. On April 11, 2019 the USFWS concurred with this determination. No further consultation is necessary at this time.

State Listed Species

Twenty-four state-listed species were identified as potentially occurring in the Project area. Of these 24 species, 13 are also federally listed and are addressed in the previous section (gray wolf, interior least tern, Mexican spotted owl, northern aplomado falcon, piping plover, Comanche Springs pupfish, Leon Springs pupfish, Pecos gambusia, Rio Grande silvery minnow, Pecos assiminea snail, Texas hornshell, Lloyd's mariposa cactus, and Pecos sunflower). Natural conducted in-field pedestrian surveys of potential habitat for the 24 state-listed threatened and endangered species with the potential to occur in the Project area beginning on April 3, 2018 to April 12, 2018; November 27, 2018 to November 30, 2018; and December 7, 2018. No suitable habitat was identified for black bear, American peregrine falcon, bald eagle, black-capped vireo, peregrine falcon, reddish egret, zone-tailed hawk, Pecos pupfish, or Proserpine shiner; therefore, we conclude that there would be no adverse impacts on these state-listed species.

Potential suitable habitat was identified for the Texas horned lizard and Trans-Pecos black-headed snake.

In order to reduce impacts to the Texas horned lizard and Trans-Pecos black-headed snake, Natural would:

- assign one full time biologist to the Project who is responsible for informing the contractor of state-listed threatened and endangered terrestrial wildlife species which may be present and to avoid intentional take of these species;

- perform activities to minimize the potential for incidental take of state-listed threatened and endangered terrestrial wildlife species and migratory birds consisting of:

    - monitoring and observing open trenches and excavated pits to ensure safe movement of trapped wildlife out of the trench/excavation prior to backfilling to the extent practicable;

    - monitoring and observing the construction work areas for wildlife burrows with the potential for the presence of western burrowing owls, and ensuring the burrows are not occupied by western burrowing owls prior to collapse; and

- monitoring of nesting activities should active western burrowing owl burrows be identified. Should eggs and/or young birds be removed, the biologist would coordinate with local licensed bird rehabilitation facilities to facilitate such removal. Additionally, should Natural identify inactive nests, or nests not essential to the survival of a juvenile bird, they would be collapsed in accordance USFWS Memorandum MBPM-2 dated April 15, 2003;

- use loosely woven, natural fiber netting where erosion control blankets are required for permanent soil stabilization and revegetation, in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings, to minimize entanglement hazards to snakes and other wildlife species; and

- use the NCRS recommended seed mix for regionally adapted vegetation in upland areas except for improved pastures. Common sunflower and desert marigold, which are listed within the Lady Bird Johnson Wildflower Center Native Plant Database as regionally adapted native species as well as pollinator species, were also added to the Project native seed mix.

Given Natural's commitment to implement its BMPs listed above, we conclude that any impacts on state-listed species would be insignificant.

5.0 LAND USE AND VISUAL RESOURCES

5.1 Land Use

Oil and gas exploration and development, active grazing, and utility rights-of-way are present in the Project vicinity. The Project would cross roads used by private ranchers and energy companies to access oil and gas infrastructure and utilities. Because of the historic condition of co-existing uses in the vicinity of the proposed Project for more than 100 years, land use categories identified in the Project area consist of rangeland, open land, and developed land.

A summary of the land use categories that would be affected by construction and operation of the proposed Project is provided in table 6 and is detailed below. As for the entire Project, the total acreage to be disturbed by construction of all Project facilities would be 340.7 acres, including 229.1 acres for construction of the pipeline, 2.1 acres for construction of the aboveground facilities, and approximately 109.7 acres for temporary construction support facilities (e.g., contractor yards and temporary access roads). The total acreage for operation of all Project facilities would be 103.0 acres, including 102.1 acres for the pipeline and 0.9 acres for the aboveground facilities.

Table 6
Land Use Impacts for the Project (Acres)

Facility	Rangeland		Open Land		Developed Land		Project Total	
	Const[a]	Op[b]	Const[a]	Op[b]	Const[a]	Op[b]	Const[a]	Op[b]
Pipeline Facilities								
Pipeline Extension	126.6	63.3	77.5	38.7	0.2	0.1	204.3	102.1
ATWS	14.6	0.0	10.1	0.0	0.0	0.0	24.7	0.0
Pipeline Facilities Total	**141.2**	**63.3**	**87.6**	**38.7**	**0.2**	**0.1**	**229.0**	**102.1**
Aboveground Facilities								
Bidirectional Interconnect	0.0	0.0	2.1	0.9	0.0	0.0	2.1	0.9
Aboveground Facilities Total	**0.0**	**0.0**	**2.1**	**0.9**	**0.0**	**0.0**	**2.1**	**0.9**
Support Facilities								
Contractor Yards	0.0	0.0	0.0	0.0	24.1	0.0	24.1	0.0
Access Roads	0.0	0.0	0.0	0.02	85.5	0.0	85.5	0.0
Support Facilities Total	**0.0**	**0.0**	**0.0**	**0.0**	**85.5**	**0.0**	**109.6**	**0.0**
Project Total	**141.2**	**63.3**	**89.7**	**39.6**	**85.7**	**0.1**	**340.7**	**103.0**

Note: The values in this table have been rounded for presentation purposes.
[a] Land affected during construction consists of temporary and permanent impacts.
[b] Land affected during operation consists only of permanent impacts.

Approximately 15.26 miles (91 percent) of the proposed pipeline extension would be constructed parallel and adjacent to existing utility (pipeline and powerline) rights-of-way to maximize use of previously-disturbed areas and minimize new impacts. The proposed Project construction workspace does overlap, in certain areas, with existing permanent rights-of-way of the existing utilities by up to 10 feet.

Rangeland

Natural defined rangeland as areas used for grazing mixed with compatible oil and gas exploration and development, including associated existing oil and gas infrastructure (e.g., pipelines, private access roads, well pad sites, and utility rights-of-way). Ranching has co-existed with oil and gas exploration and development in the area since the early 1900s. Rangeland is characterized by large open areas used for livestock ranching and dominated by the following vegetative types: mesquite upland shrub; creosote bush, mixed desert, and thron scrub; mixed desert shrub steppe. Natural has indicated that areas along the proposed right-of-way are actively used for grazing.

Rangeland is the dominant land use type within the Project area. Approximately 10.44 miles of the proposed Project would cross rangeland. About 141.2 acres of rangeland would be temporarily disturbed during construction of the pipeline extension and ATWS. Project operation would impact approximately 63.3 acres of rangeland. Rangeland would not be affected by aboveground facilities or support facilities. All construction workspaces in rangeland areas, including those in the permanent right-of-

way, would be restored to pre-construction conditions once construction is complete.

Open Land

Open land is characterized as those areas not used for active ranching. Open land consists of large open areas that include oil and gas exploration and development. The area is dominated by creosote bush, mixed desert, and thron scrub; mixed desert shrub steppe; and mesquite upland shrub. This land use category also includes open land not specifically designated for outdoor recreation or agriculture.

Open land is the second most prevalent land use type crossed by the proposed Project. The proposed pipeline crosses approximately 6.4 miles of open land. About 77.5 acres of open land would be temporarily disturbed during construction of the pipeline with an additional 10.1 acres disturbed by ATWS. The pipeline extension would permanently impact approximately 38.7 acres of open land. In addition to the pipeline extension, Natural would construct a bidirectional interconnect at the southern terminus of the pipeline extension. The bidirectional interconnect would consist of an unmanned facility enclosed by chain link fence that would contain appurtenant facilities and would be south and adjacent to the pipeline extension construction right-of-way. Approximately 0.9 acres of open land would be impacted for operation of the bidirectional interconnect. Construction of a new access road (AR-3a) is also required for permanent operational access for the proposed Project. AR-3a is approximately 34 feet long and 20 feet wide and would connect existing AR-3 with the bidirectional interconnect. AR-3a would impact approximately 0.02 acre of open land.

All construction workspaces in open land, including in the permanent right-of-way (with the exception of the access road and aboveground facility), would be restored and allowed to revert to pre-construction conditions once construction activities have been completed.

Developed Land

This land use category is characterized by existing transportation rights-of-way and commercial/industrial areas within the Project area. Two contractor yards are included in this land use category, which total approximately 24.1 acres. Contractor Yard No. 1 is the larger of the two at 20.0 acres, while Contractor Yard No. 2 is about 4.1 acres. These areas would be used for equipment, pipe, and material storage; potential soil storage and hydrostatic test water discharge areas; temporary field offices; and pipe preparation/field assembly areas. Following construction, Natural would restore the construction yards to pre-construction conditions.

Also included in developed land are public and private roads that would either be used by Natural for Project construction and operation or roads that would be crossed by

the Project. Natural would utilize 14 existing public and private roads for both construction crews and the delivery of pipe and equipment for the proposed Project. The existing access roads would cover a total of approximately 85.5 acres during construction. The temporary access roads would be restored to pre-construction conditions during restoration activities, with the exception of 0.02 acre associated with AR-3a, discussed in the previous section, which would be maintained for permanent operational access.

All three public roads would be crossed by the conventional boring method: County Road 427, FM 1450 (State Road), and El Paso Road (County Road). Natural does not anticipate any temporary or permanent impacts on these roadways. The public roads would also be used by Natural to move construction equipment where they intersect the proposed pipeline alignment as construction progresses. This would be done in accordance with applicable safety requirements and with consideration for maintenance of existing road surface conditions.

Natural would implement the mitigation measures in our Plan and Procedures, along with any other agency requirements and relevant landowner agreements to minimize impacts and to restore the Project area following construction. All temporary workspaces would be restored to pre-construction conditions. Although there would be some permanent impacts due to new aboveground facilities and the permanent access road for Project operation, the proposed facilities are consistent with the existing landscape and historic land use of the Project vicinity. Therefore, we conclude that the proposed Project would not have a significant impact on land use.

5.2 Visual Resources

The Project is proposed in an area of low to medium visual sensitivity. Impacts on visual and/or aesthetic resources would primarily occur during construction as a result of the presence of construction equipment, vegetation clearing, and grading of the construction workspace. Most impacts on visual resources would be temporary; however, the construction of the new bidirectional interconnect and permanent access road would create some minor permanent impacts on the visual landscape.

The proposed Project crosses the Big Valley Irrigation Canal, built in the late nineteenth–early twentieth century to support and promote agriculture in the Pecos River Valley. As discussed in section B.6 (Cultural Resources), the canal is eligible for listing on the National Register of Historic Places (NRHP) and considered a visually-sensitive resource. In a letter dated April 10, 2018, the Texas State Historic Preservation Officer (SHPO) indicated that the Project would have no adverse effect to the historic canal if one of the following construction methods would be used: boring underneath the canal through traditional or horizontal directional drilling; or, open cut followed by restoration to pre-existing contours. Natural proposes an open cut at the canal crossing, followed by

restoration to pre-existing contours. As such, no adverse effect to the Big Valley Irrigation Canal is anticipated.

One historic residential property in Ward County, the Guyton Ranch, was identified within the viewshed of the proposed Project. The property is approximately 656 feet east of MP 4.32 and adjacent to AR-10. Because the pipeline extension is the only Project facility in visual proximity to the Guyton Ranch, any visual affect would be temporary and only occur during construction. See section B.6 (Cultural Resources) for additional information regarding Guyton Ranch.

The Texas Pecos Trail, a scenic state byway and heritage trail includes the portion of Interstate 20 approximately 2.3 miles north of MP 0.00. The distance from the northernmost point of the pipeline extension to the Texas Pecos Trail is substantial enough to not adversely affect the viewshed from Interstate 20. Traffic would be temporarily increased in the vicinity of AR-14 and Interstate 20 during construction.

We conclude that because the visual impacts from Project construction would be mostly temporary and the permanent visual impacts from the aboveground and support facilities would be minimal and consistent with the existing visual setting of oil and gas exploration/development and utility rights-of-way, visual impacts from the proposed Project would not be significant.

6.0 CULTURAL RESOURCES

In addition to accounting for impacts to cultural resources under NEPA, Section 106 of the National Historic Preservation Act, as amended, requires FERC to take into account the effects of its undertakings on historic properties listed, or eligible for listing on the NRHP,[6] and to afford the Advisory Council on Historic Preservation an opportunity to comment. Natural, as a non-federal party, is assisting FERC in meeting our obligations under Section 106 and its implementing regulations at 36 CFR 800.

6.1 Area of Potential Effects

The area of potential effects (APE) is the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(d)). The APE for direct effects includes areas that would be impacted by the construction, operation, and maintenance of proposed facilities (i.e., permanent and temporary workspaces). The

[6] In accordance with 36 CFR 800.16(l)(1), a historic property is any prehistoric or historic district, site, building, structure, object, or property of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization, included in, or eligible for inclusion in, the NRHP. This term includes artifacts, records, and remains that are related to and located within such properties. Cultural resources are those properties that have not been evaluated for NRHP eligibility.

APE must also account for indirect effects which considers the visual, auditory, and atmospheric effects caused by a project that may alter the character-defining features of a historic property, particularly those of historic structures and/or districts.

Natural developed the Project APE in consultation with the SHPO and totals approximately 1,328.0 acres. The Project direct APE consists of a 300-foot-wide corridor for each facility, contractor yard, and access road (including all temporary and additional workspace). The indirect APE consists of a 500-foot buffer around the Project area that would account for any indirect effects on historic properties by the proposed Project. Due to the area's topography, vegetation, and surrounding land use, we conclude the APE is sufficient to account for all the potential direct and indirect effects to historic properties by the proposed Project.

6.2 Cultural Resources Investigation

In an effort to identify historic properties and the Project's effects to those properties within the APE, Natural conducted a cultural resources investigation, which included background research, a Phase I archaeological survey, and historic resources survey (Peltier et al 2018 and 2019).

A Phase I archaeological and historic resources survey was conducted in April 2018 and consisted of pedestrian transects of no greater than 15 meter intervals, supplemented with systematic shovel testing in areas with less than 30 percent ground surface visibility and at all newly identified archaeological sites. Twenty-four shovel tests were excavated as part of the survey. A total of 40 isolates were recorded; however, these resources are not eligible for listing in the NRHP. Five newly identified prehistoric archaeological sites (41RV135-139) were also identified within the Project APE. All of the archaeological sites represent prehistoric lithic scatters. Two historic resources were also identified during the field survey: the Big Valley Irrigation Canal (41RV75) and the Guyton Ranch.

Natural recommended that sites 41RV135, -136, -137, and -139 are not eligible for inclusion in the NRHP as it is unlikely the resources would yield significant information about the prehistoric occupation of the area as the four sites consist of thin soil profiles and lack integrity, diagnostic materials, artifact concentrations, or artifact diversity. Conversely, site 41RV138 represents a sprawling artifact scatter where lithic reduction, tool maintenance, and food processing likely took place, and though the site appears to have been impacted by water erosion and wind deflation, the site's surface component retains moderate integrity. A portion of site 41RV138 is within the Project's proposed temporary workspace. Natural recommended that this portion of the site would not contribute to the site's overall potential eligibility and, therefore, would not be affected by the proposed Project.

Built by the Big Valley Canal & Irrigation Company in the late nineteenth-early twentieth century, the Big Valley Irrigation Canal has been previously recorded and determined eligible for inclusion in the NRHP under Criterion A for its role in the early agricultural industry in the Pecos River Valley. The proposed Project crosses the canal between milepost 5.3 and 5.4. Natural proposes an open-cut at the canal crossing, followed by restoration to pre-existing conditions after construction activities are complete. These proposed construction methods meet the Texas Historical Commission's recommendations for the canal crossing. Therefore, Natural recommended that the Project will have no adverse effect on the historic canal.

The Guyton Ranch is a historic residential property, with a single-family residence and outbuilding, 656 feet east of the proposed pipeline corridor and adjacent to temporary access road TAR-10. The Guyton Ranch was identified on a 1954 USGS topographic quadrangle. Natural recommended that the Guyton Ranch is not eligible for inclusion in the NRHP and would not be affected by the proposed Project.

A supplemental archaeological and historic resources survey was conducted in November and December 2018 using the same field methods as the original survey. No new archaeological sites or historic resources were identified during the supplemental survey, only four isolated finds were recorded.

Based on the results of the cultural resources investigation, Natural recommended that the proposed Project would have no adverse effect on historic properties.

On May 5, 2018, Natural sent the results and recommendations from the original Phase I archaeological and historic resources survey to the Texas SHPO for review and concurrence. In correspondence dated June 6, 2018, the Texas SHPO concurred with Natural's recommendations, including that the proposed Project would not adversely affect historic properties, but should the Project area vary near site 41RU138, additional testing would be necessary. The supplemental survey report was sent to the Texas SHPO on January 2, 2019 for review and concurrence. The Texas SHPO replied on February 25, 2019 that based on their review of the supplemental information, no additional historic properties are present or affected by the proposed Project. We agree.

6.3 Tribal Consultation

Natural contacted the following Native American tribes regarding the proposed Project: Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Caddo Nation of Oklahoma, Cherokee Nation of Oklahoma, Comanche Nation of Oklahoma, Coushatta Tribe of Louisiana, Delaware Nation of Oklahoma, Kialegee Tribal Town, Kickapoo Traditional Tribe of Texas, Kickapoo Tribe of Oklahoma, Kiowa Tribe of Oklahoma, Mescalero Apache Tribe, Poarch Band of Creek Indians, Quapaw Nation, Seminole Nation of Oklahoma, Thlopthlocco Tribal Town, Tonkawa Tribe of Oklahoma, Tunica-Biloxi Tribe of Louisiana, United Keetoowah Band of Cherokee Indians, and

Wichita and Affiliated Tribes. On April 11, 2018, Natural provided the tribes with Project notification letters and solicitation of comments regarding the proposed Project. On July 3, 2018, Natural conducted follow-up telephone calls with the tribes.

In a letter dated May 16, 2018, the Quapaw Nation indicated that the Project is outside the tribe's current area of interest and the tribe does not wish to comment at this time. The Kiowa Tribe sent a letter on May 8, 2018 expressing that the proposed Project should have minimal potential to adversely affect any known archaeological, historical, or sacred Kiowa sites. The Kiowa Tribe also indicated that any undiscovered properties must be reported to the Kiowa Tribe Office of Historic Preservation. On April 24, 2018 the Delaware Nation sent an email to Natural stating that they concur with the Project and requesting that the tribe be contacted in the event of inadvertent discoveries. The Delaware Nation also provided recommendations on the avoidance and protection of archaeological sites and resources important to the tribe. On July 2, 2018, Natural acknowledged the Delaware Nations' recommendations and agreed that that the protection of the Delaware Nation's tribal resources would require ongoing cooperation and coordination with the Delaware Nation and FERC.

During the July 3, 2018 follow-up telephone calls, four tribes responded that they had no further interest in the Project, including the Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Coushatta Tribe of Louisiana, and Kialegee Tribal Town.

Natural provided updated Project notification letters on December 5, 2018 to all Native American tribes who either expressed interest in the Project or who did not respond to the original Project notification letter mailed on April 11, 2018. Both sets of letters asked that tribes identify any concerns they might have regarding potential traditional cultural properties (TCPs) or properties of religious, cultural, or historical significance. To date, no TCPs or properties of religious, cultural, or historical significance to the tribes have been identified in the Project APE.

Natural received additional correspondence from the Delaware Nation of Oklahoma and the Quapaw Nation. In a letter dated January 16, 2019, the Delaware Nation indicated that the location of the proposed Project does not endanger cultural or religious sites of interest to the tribe. The tribe also requested that they be contacted within 24 hours if archaeological sites or artifacts are discovered during Project construction. The Quapaw Nation sent a letter on March 6, 2019, expressing again that the Project is outside the tribe's current area of interest and that they not wish to comment of the proposed Project.

FERC sent the Project NOI on March 1, 2019 to the original list of tribes. FERC also contacted tribes by letter on April 3, 2019 except for the five tribes listed above that indicated they had no further interest in the proposed Project. In a letter dated May 1,

2019, the Kickapoo Traditional Tribe of Texas indicated that the tribe does not own land located in the Project area and that they are not aware of any historic and/or sacred sites important to the tribe that would be affected by the proposed Project. FERC has not received any correspondence from the other tribes contacted regarding the proposed Project.

6.4 Unanticipated Discoveries Plan

Natural developed a Project-specific Unanticipated Discoveries Plan which outlines the procedure to follow, in accordance with state and federal laws, in the event that unanticipated cultural resources or human remains are discovered during construction of the Project, including consultation with FERC, the SHPO, and tribes regarding discoveries. The plan was submitted to FERC and the Texas SHPO; both requested minor changes to the plan. Natural has provided copies of the revised plan with the requested revisions to FERC and the Texas SHPO. We find the plan to be acceptable.

6.5 Compliance with the National Historic Preservation Act

FERC has completed its compliance requirements with Section 106 of the National Historic Preservation Act for the proposed Project.

7.0 AIR QUALITY AND NOISE

7.1 Air quality

Air quality in the Project area would be affected by construction and operation of the Project. The term air quality refers to relative concentrations of pollutants in the ambient air. The subsections below summarize federal and state air quality regulations that are applicable to the Project. This section also characterizes the existing air quality and describes potential impacts the facilities may have on local and regional air quality.

Existing Environment

The Project area is within Ward, Reeves, and Pecos Counties, Texas. The climate in the Project area is semi-arid, with hot summers with a large diurnal temperature range, and winters characterized by frequent cold periods followed by rapid warming. Rainfall typically averages 11.8 inches per year. The annual normal monthly mean temperature is 80 degrees Fahrenheit (ºF). The mean number of days with a maximum temperature of 32 ºF or less is 32, and the mean number of days with a maximum temperature of 90 ºF or greater is 135 (National Weather Service, Midwest Regional Climate Center, 2019) .

Ambient air quality is protected by the Clean Air Act (CAA) of 1970, as amended in 1977 and 1990. The USEPA oversees the implementation of the CAA and establishes

National Ambient Air Quality Standards (NAAQS) to protect human health and welfare.[7] 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 (USEPA, 2018a). Although ozone is a criteria air pollutant, it is not emitted into the atmosphere from an emissions source; rather, it develops as a result of a chemical reaction between nitrogen oxides (NOx) and VOCs in the presence of sunlight. Therefore, NO_X and VOCs are referred to as ozone precursors and are regulated to control the potential for ozone formation. 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 below.

The USEPA, and state and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the U.S. These 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).

Air quality control regions (AQCR) are areas established by the USEPA and local agencies for air quality planning purposes, in which State Implementation Plans describe how the NAAQS would be achieved and maintained. The AQCRs are intra- and interstate regions (such as large metropolitan areas) where improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. The Project area is within the Midland-Odessa-San Angelo Intrastate AQCR, which is unclassifiable/attainment for all NAAQS.

Greenhouse gases (GHG) occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. Carbon dioxide is the primary GHG emitted during fossil-fuel combustion, while smaller amounts of methane and nitrous oxide are GHGs that are also emitted. GHGs are non-toxic and non-hazardous at normal ambient concentrations, and there are no applicable ambient standards or emission limits for GHG under the CAA. The primary GHGs that would be emitted by the Project are carbon dioxide (CO_2), methane, and nitrous oxide. During construction and operation of

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

the Project, these GHGs would be emitted from the majority of construction and operational equipment, as well as from fugitive methane leaks from the pipeline and aboveground facilities.

Emissions of GHGs are typically quantified and regulated in units of carbon dioxide equivalents (CO_2e). The CO_2e takes into account the global warming potential (GWP) of each GHG. The GWP is the measure of a particular GHG's ability to absorb solar radiation as well as its residence time within the atmosphere. The GWP allows comparison of global warming impacts between different gases; the higher the GWP, the more that gas contributes to climate change in comparison to CO_2. Thus, CO_2 has a GWP of 1, methane has a GWP of 25, and nitrous oxide has a GWP of 298.[8]

Regulatory Requirements

The provisions of the CAA that may be applicable to the Project are discussed below. Federal air quality requirements are contained in 40 CFR Parts 50 through 99. However, because the Project would not result in any stationary emissions sources, and because the Project is in an attainment area, there are no federal air quality permits that are applicable to the Project.

State air quality regulations are contained in the Texas Administrative Code, Title 30, Part I, Chapters 101-122 and are administered by the TCEQ. Applicable state requirements are reviewed below.

Permit By Rule

Project operations would result in fugitive emissions from the new piping, metering station, and pig receiver. Natural would utilized TCEQ's Permit By Rule for fugitive emissions associated with the Project. The Permit By Rule does not require registration or approval.

Construction Impacts and Mitigation

Project construction would result in temporary, localized emissions that would last the duration of construction activities (i.e., about 6 months). Heavy equipment, trucks, delivery vehicles, and construction workers commuting to and from work areas would generate exhaust emissions through the use of diesel or gasoline engines. Additionally, connecting the new piping and other equipment into the existing system during construction would result in fugitive gas emissions due to venting gas from Natural's existing system. Gas would be vented directly to the atmosphere and purged from the system in order to provide a safe work environment for construction.

[8] 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.

Construction activities, such as land clearing and grading, ground excavation and soil disturbance, and driving on unpaved roads would also result in the temporary generation of fugitive dust. 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.

Natural estimated construction emissions 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 USEPA's NONROAD and MOVES model, the Climate Registry's 2014 *Default Emission Factors* (The Climate Registry, 2014), and 40 CFR 98. Fugitive dust emissions were estimated using methodology in the Western Regional Air Partnership *Fugitive Dust Handbook* (WRAP, 2006). Table 7 below provides the total Project construction emissions, 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 7
Project Construction Emissions (tons per construction duration)

Activity	NO	CO	PM_{10}	$PM_{2.5}$	SO_2	VOC	CO_{2e}
Fugitive Dust	-	-	7.37	0.7	-	-	-
Non-road Equipment Engines	10	20	0.7	0.7	0.02	1.4	2,999
On-Road Engines	0.6	3.7	0.01	0.01	0.02	0.03	1,309
Venting	-	-	-	-	-	0.03	346
Total Emissions	**10.6**	**23.5**	**8.1**	**1.4**	**0.04**	**1.7**	**4,654**

Construction emissions shown in table 7 are not expected to result in a degradation of ambient air quality standards or an exceedance of the NAAQS. To minimize construction emissions, Natural would require its contractors to meet all federal, state, and local air quality regulations and emission standards applicable to the equipment. Natural would minimize construction fugitive dust by implementing the following measures:

- use of water during construction operations for suppression of dust during road grading, or land clearing;
- cover open hauling trucks as necessary;
- limit vehicle speeds;
- minimize soil disturbance; and
- stabilize disturbed areas promptly after completion of construction.

Construction emissions would occur over the duration of construction activity and would be emitted at different times throughout the Project area. Construction emissions would be relatively minor and would result in short-term, localized impacts in the immediate vicinity of construction work areas. We conclude air quality impacts from

construction would be temporary and would not result in significant impact on local or regional air quality.

Operational Impacts and Mitigation

Project operation would result in fugitive emissions, which are minor leaks that would occur at valves, seals, and other piping components, at the meter station and along the pipeline (including from pigging activities). Table 8 below provides total operational emissions of the Project.

Table 8
Project Operation Emissions (tons per year)

Proposed Unit	NOx	CO	$PM_{2.5}$	PM_{10}	SO_2	VOC	HAPs	CO_2e
Fugitives	-	-	-		-	0.4	0.02	0.07
Pigging	-	-	-		-	1.7	0.06	95.6
Meter Station	-	-	-		-	0.3	0.0	15.9
Total Annual Emissions	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**2.4**	**0.08**	**111.6**

Based on the minor quantity of air emissions associated with Project operation, we conclude the proposed Project would not cause or significantly contribute to a degradation of ambient air quality or an exceedance of the NAAQS.

7.2 Noise

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Construction and operation of the Project would affect overall noise levels in the Project area. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures that relate the time-varying quality of environmental noise to its known effect on people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is an A-weighted sound level containing the same energy as the instantaneous sound levels measured over a specific time period. Noise levels are perceived differently, depending on length of exposure and time of day. The L_{dn} takes into account the duration and time the noise is encountered. Specifically, the L_{dn} is the L_{eq} plus a 10 decibel on the A-weighted scale (dBA) penalty added to account for people's greater sensitivity to nighttime sound levels (typically considered between the hours of 10:00 p.m. and 7:00 a.m.). The A-weighted scale is used to assess noise impacts because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise (Bies and Hansen, 1988).

Federal Noise Regulations

In 1974, the USEPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (USEPA, 1974). This document provides information for state and local governments to use in developing their own ambient noise standards. The USEPA has indicated that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at noise sensitive areas (NSAs). NSAs are defined as homes, schools, churches, or any location where people reside or gather. FERC requires that the noise attributable to any new compressor engine or modifications during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. This requirement is often applied to meter stations or nighttime construction activities. For a facility to meet the 55 dBA L_{dn} limit, a 10 dBA nighttime penalty is added prior to the logarithmic calculation of the L_{dn} . As such, the facility L_{dn} 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.

There are no applicable state, county, or local noise regulations.

Construction Noise Impacts and Mitigation

Noise would be generated during construction of the Project. Construction activities in any one area could last from several weeks to several months on an intermittent basis. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and local. Natural would construct the majority of construction activities from Monday through Saturday, 6 am to 10 pm. However, depending on weather or site conditions, specialized construction techniques, emergencies, or other atypical circumstances, Natural may work overnight or on Sundays. There are no NSAs within 0.5 mile of any construction workspaces, including the meter station, with the exception of one NSA 0.42 mile away from the pipeline workspace. The NSA is a temporary residence; Natural would not conduct nighttime construction activities within 0.5 mile of this NSA when it is occupied. Natural estimates that construction noise would result in noise levels of 60 dBA L_{eq} at the nearest occupied NSA, which is 0.6 miles from construction. Based on the temporary nature of construction activities, the distance to NSAs, and Natural's commitment to conduct the majority of construction activities between the hours of 6:00 am to 10:00 pm, we conclude that construction noise would not result in significant noise impacts on residents or the surrounding communities.

Operational Noise Impacts and Mitigation

Although the meter station would result in noise impacts during Project operation, the nearest NSA is 2.4 miles away. Natural did not quantify the noise environment. Due

to the large distance between noise sources and the nearest NSA, we conclude the Project would not result in significant noise impacts on NSAs.

8.0 Reliability and Safety

The pressurization of natural gas at a compressor station 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 degrees 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. It is buoyant at atmospheric temperatures and disperses rapidly in air.

8.1 Safety Standards

The DOT is mandated to prescribe minimum safety standards to protect against risks posed by pipeline facilities under Title 49 of the U.S.C., Chapter 601. The DOT's 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 level.

The pipeline and aboveground facilities associated with the Project must be designed, constructed, operated, and maintained in accordance with the DOT Minimum Federal Safety Standards in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The DOT specifies material selection and qualification; minimum design requirements; and protection from internal, external, and atmospheric corrosion.

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.
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. The Project would be designed to meet the requirements of Class 1 locations.

8.2 Emergencies

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

- 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 or facility emergency, and to coordinate mutual assistance. Natural must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas emergency and report it to appropriate public officials. Natural would provide the appropriate training to local emergency service personnel before the Project is placed into 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).[11]

During the 20-year period from 1999 through 2018, a total of 1,373 significant incidents were reported on more than 300,000 total miles of natural gas transmission pipelines nationwide (U.S. DOT-PHMSA 2018b,c). Additional insight into the nature of service incidents may be found by examining the primary factors that caused the failures. Table 9 provides a distribution of the causal factors as well as the number of each incident by cause.

Table 9
Natural Gas Transmission Pipeline Significant Incidents

Cause	Number of Incidents by Cause 1999-2018[a]	Percentage
Pipeline material, weld, or equipment failure	413	30.1
Corrosion	317	23.1

[11] $50,000 in 1984 dollars is approximately $123,509.32 as of February 2019 (CPI, Bureau of Labor Statistics, 2019)

Table 9 Natural Gas Transmission Pipeline Significant Incidents		
Cause	**Number of Incidents by Cause 1999-2018[a]**	**Percentage**
Excavation	195	14.2
Natural force damage [c]	156	11.4
All other causes [b]	142	10.3
Outside force [d]	95	6.9
Incorrect operation	55	4.0
Total	1,373	100

a All data gathered from PHMSA's Oracle BI Interactive Dashboard website for Significant Transmission Pipeline Incidents, https://hip.phmsa.dot.gov/analyticsSOAP/saw.dll?Portalpages. Accessed 2/21/19.

b All other causes include miscellaneous, unspecified, or unknown causes.

c Natural force damage includes earth movement, heavy rains/floods, high winds, lightning, temperature, unspecified natural force damage, and other natural force damage.

d Outside force damage includes electrical arcing, fire/explosions, fishing or maritime activities, intentional damage, maritime equipment, previous mechanical damage, unspecified or other outside force damage, and vehicle damage (not associated with excavation).

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. We received a comment from a landowner concerned with pipeline corrosion. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the corrosion rate compared to unprotected or partially protected pipe.

The dominant causes of pipeline incidents are corrosion and pipeline material, weld or equipment failure constituting 53.2 percent of all significant incidents. The pipelines included in the data set in table 9 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.

Outside forces, excavation, and natural forces are the cause of 32.5 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. Older pipelines have a higher frequency of outside forces incidents, in part because their location may be less well known and less well marked as compared to newer pipelines. In addition, older pipelines comprise a disproportionate number of smaller-diameter pipelines, which have a greater rate of outside force incidents. Smaller 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 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 pre-construction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. Natural would be required to comply with the requirements of the “One Call” program. In addition, Natural would utilize the state-wide “One Call” program in Texas for pre-excavation notification.

The Project’s construction and operation would represent a minimal increase in risk to the public; however, we are confident that with Natural’s continued compliance with DOT safety standards, operation, and maintenance requirements, the Project would be constructed and operated safely.

9.0 CUMULATIVE IMPACTS

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

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

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

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

and residential developments, and large industrial facilities construction and operation.

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

Natural identified past, present, and reasonably foreseeable future actions within each of the resource-specific geographic scopes through review of publicly accessible federal, state, and local agency and municipal websites and direct communications; permit applications; paid and free-access database searches; and third-party communications. Table C-1 in appendix C provides actions with the potential to contribute to cumulative impacts within the same geographic scope and timeframe as the Project. Specifically, table C-1 includes a brief description of these actions, identifies the locations and distances of the actions from the Project, characterizes the timeframe for these actions (*e.g.*, past, present, and future), provides footprint/layout estimates and anticipated impacts based on publicly available information, and summarizes the permits or authorizations required for the projects and any environmental review required to support the permits or authorizations. As shown in table C-1, a total of 41 actions were identified as past, present, and reasonably foreseeable future actions to be considered in the cumulative impact analysis for the Project. Table C-1 describes the approximate locations of these past, present, and reasonably foreseeable future actions within with the resource-specific geographic scopes.

As discussed in preceding sections of this EA, wetlands, wild or scenic rivers, recreation areas, national parks and wildlife areas, residential areas and coastal zone management areas would not be affected by the Project. Also air quality and noise during project operation would not result in discernable impacts. As such, these resources are not evaluated further in our cumulative impact analysis below.

Geologic Resources and Soils

We considered the cumulative impacts of the Project and other projects in the vicinity of the Project area on geologic resources and soils. Impacts on soils would be highly localized and primarily limited to the respective project footprints during active construction; therefore the geographic scope for soils is the Project footprint. Cumulative impacts on soils would only occur if other geographically overlapping or abutting projects were constructed at the same time as the Project. For geologic resources and hazards, the geographic scope for cumulative impact analysis includes the area within 0.5 mile of the Project, to encompass potential nearby oil and gas well development activities.

The past, present, and reasonably foreseeable future actions located within or cross through the 0.5-mile buffer area and are therefore considered for cumulative impact analysis with respect to geological resources and soils are shown in table C-1.

Construction of the Project facilities is expected to have only temporary and localized impact on the near surface geology. Natural anticipates shallow excavations for pipeline trenches and appurtenant and auxiliary facilities. Pending oil/gas well projects could be under construction while Natural's proposed construction would take place. The only other projects under consideration to have potentially concurrent construction periods consist of: Permian Highway Pipeline, which at its closest location to the extension pipeline is 0.43 mile west of MP 16.50, and Texas DOT Project No. 163901016, which crosses the pipeline extension at MP 12.14. Other projects in the geographic scope for geologic resources would also involve land disturbance, which could result in impacts to mineral resources. However, because there are no anticipated adverse impacts to mineral resources associated with the proposed Project, and combined with the implementation of best management practices, the Project is not anticipated to contribute to any potential cumulative impacts on mineral resources. With the implementation of best management practices the cumulative effect on geologic resources is anticipated to be negligible.

Pending oil/gas well projects could be under construction while Natural's proposed construction would take place. The only other projects under consideration to have potentially concurrent construction periods consist of Texas DOT Project No. 163901016, which crosses the pipeline extension at MP 12.14. Implementing BMPs, such as erosion and sedimentation control devices, returning the site to preexisting topography and re-establishing vegetative cover can minimize potential soil impacts during construction-related activities. Texas DOT would likely implement similar BMPs. Therefore, we conclude that construction or operation of the Project would not contribute significantly to cumulative impacts on soil resources when considered in conjunction with other past, present, and reasonably foreseeable projects in the geographic scope.

Water Resources

Impacts on surface waters can result in downstream contamination or turbidity; therefore, the geographic scope used to assess cumulative impacts on water resources includes the 12-digit Hydrologic Unit Code (HUC-12) subwatersheds crossed by the Project. All of the waterbodies that would be crossed by the Project are within HUC-12 130700011006 (Big Valley Canal-Pecos River) and 130700011005 (Blake Draw).

As discussed in section B.3.1 the Project overlays one major aquifer, the Pecos Valley Aquifer. Direct impacts on groundwater resources would be limited to dewatering of the pipeline trench, which may be necessary in areas where there is a high water table or during periods of excessive precipitation. However, any lowering of localized groundwater is expected to be temporary. Water for Project construction activities would

be obtained from a commercial or municipal source that may withdrawal from existing groundwater sources. No water usage is proposed for the Project during operation.

Although there is a potential for groundwater and surface water contamination from fuel, lubrication oil, or hydraulic oil spills to occur during construction, no long-term or permanent impacts on groundwater resources or users are expected from the Project.

Construction and operation of the Project as well as past, present, and reasonably foreseeable future actions located within the geographic scope has the potential to impact surface water quality through direct impacts. Oil and gas production wells are typically cited outside of surface waters, such as wetlands and streams. However, if they were to impact wetlands or streams a permit from the USACE would be required. Additionally, these projects would likely implement BMPs similar to those proposed by Natural to minimize impacts on waterbodies.

The Double E Natural Gas Pipeline crosses 13 waterbodies, including the Big Valley Canal, the Pecos River and 11 ephemeral streams; Orla Gas Processing Plant to Waha Hub crosses 13 waterbodies including the Big Valley Canal, the Pecos River and nine ephemeral streams; and Permian Highway Pipeline Project, Red Bluff Express Pipeline, Roadrunner Gas Transmission Pipeline, Comanche Trail, Lariat Gathering Pipeline, and Pecos System – DP2 20-inch Pipeline each cross one ephemeral stream, within the HUC-12. .

Pending oil/gas well projects could be under construction while Natural's proposed construction would take place. The only other projects under consideration to have potentially concurrent construction periods include: the Permian Highway Pipeline, which at its closest location to the pipeline extension is 0.13 mile west of MP 16.50 and Texas DOT Project No. 163901016, which crosses the pipeline extension at MP 12.14.

Temporary cumulative impacts associated with crossing the Pecos River and other waterbodies could potentially include loss of vegetation; wildlife habitat disruption; soil disturbance associated with grading and trenching; sedimentation and turbidity increases; and hydrological profile changes.

Many natural gas pipelines in the U.S. are permitted by way of the USACE Nationwide Permit (NWP) 12. NWP 12 authorizes "activities for the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States…" and largely complies with the National Environmental Policy Act. Per the Draft Decision Document Nationwide Permit 12, a NWP 12 is issued when a project has "minimal individual and cumulative adverse environmental effects" (USACE 2012).

Natural would implement crossing procedures as outlined in our Plan and

Procedures and would obtain and follow NWP 12 for the surface water crossings as well as follow state permit guidelines, to further minimize impacts. Therefore, the Project's impacts on surface water resources, when added to other past, present and reasonably foreseeable actions is minimal both individually and cumulatively.

Vegetation and Wildlife

Cumulative impacts on vegetation, and wildlife resources (primarily due to increased turbidity or contamination due to spills), could extend outside of the Project workspaces, but would likely be contained to a relatively small area (the HUC-12 sub-watersheds). Therefore, past, present, and reasonably foreseeable actions within the HUC-12 watersheds noted above are within the geographic scope for cumulative impacts for vegetation and wildlife and are considered in this cumulative impact analysis.

Overlapping construction schedules would result in greater area and duration of vegetation and wildlife disturbance. The acreage of impacts from the projects listed in table C-1 are unavailable. However, due to the abundance of similar habitats within the geographic scope, cumulative impacts on vegetation/wildlife habitat as a result of the proposed Project and projects listed above are anticipated to be minor.

Where construction schedules overlap, increased noise, lighting, and human activity could also disturb wildlife in the area. Wildlife may temporarily displace to nearby suitable habitat, but are anticipated to return to those areas temporarily impacted following the completion of construction activities. However, abundant habitat would remain available within the geographic scope. All projects would be required to implement storm-water runoff controls, SPCC Plans, and other mitigation measures required by the state and federal permits. Therefore, the Project when considered cumulatively with past, present, and reasonably foreseeable projects, would result in temporary, local, and minor increases in noise, light, and human activity and would not contribute to significant cumulative impacts on vegetation or wildlife within the geographic scope of the Project.

Land Use and Visual Resources

Impacts on general land uses would be restricted to the construction workspaces and the immediate surrounding vicinity. Impacts on visual resources includes the surrounding area from where a new facility or construction activity would be visible. Therefore, the geographic scope for land use and visual resources is one mile the Project facilities. The projects listed in table C-1 that are within the geographic scope for the proposed Project are related to oil and gas development with the exception of two Texas DOT road projects. Construction activities relative to the other projects aggregated with that of this Project do have the potential to alter land use. However, as previously stated, historic land use in this region of west Texas has consisted of livestock ranching and agriculture practices combined with oil and gas exploration and development. Additionally, the majority of the proposed Project (91 percent) would be parallel and

adjacent to an existing pipeline and utility rights-of-way, which would not alter the landscape compared to the existing setting. Further, most of the other projects within the geographic scope would be consistent with the character and visual setting of the existing landscape. This Project, as well as the other projects listed in table C-1, would implement BMPs including measures to minimize potential erosion, revegetate disturbed areas, and stabilize site conditions post-construction, which would further minimize cumulative impacts. Therefore, no significant changes in land use and visual impacts would occur as a result of the proposed Project in combination with the other projects listed in table C-1.

Air Quality

Due to the limited amount of emissions generated by construction equipment, the geographic scope used to assess potential cumulative impacts on air from construction activities was set at 0.25 mile from the Project area. Construction of the Project would result in short-term and temporary impacts on air quality in the vicinity of the Project area. Construction of the project may occur concurrently with construction of multiple projects in table C-1 and may contribute cumulatively to impacts on air quality. However, based on the short-term and temporary nature of construction activities, impacts from the Project are not expected to significantly contribute to cumulative impacts on air quality during construction.

Noise

The geographic scope for assessing potential cumulative impacts on noise was determined to be areas within the immediate proximity of the construction activities (0.25 mile). Construction of the Project would result in short-term and temporary impacts on existing noise levels in the Project area. Construction of the Project may occur concurrently with construction of multiple projects in table C-1 and may contribute cumulatively to impacts on noise levels. However, based on the short-term and temporary nature of construction-related activities, impacts from the Project are not expected to significantly contribute to cumulative impacts on noise levels during construction.

C: ALTERNATIVES

1.0 ALTERNATIVES

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

- ability to meet the Project's stated objective to transport up to 500 million cubic feet per day of natural gas to the TPP header at the Waha Hub;
- technical and economic feasibility and practicality; and
- whether the alternative provides a significant environmental advantage over the proposed action.

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

1.1 No-Action Alternative

Under the No-Action Alternative, Natural would not construct the Project. If the proposed facilities were not constructed, the adverse impacts identified in this EA would be avoided; however, the Project objectives would not be met. Under the No-Action Alternative, Natural would not be able to meet the Project shipper's stated need to transport up to 500 million cubic feet per day of firm natural gas supply to the TPP header at the Waha Hub. The Project would allow Natural to directly connect to the Waha Hub, a major natural gas trading point in the Gulf of Mexico region, to which Natural is not currently connected. If the No-action Alternative is selected, other natural gas transmission companies could propose to construct similar facilities to meet the shipper's demand for the additional volume of natural gas. Such actions could result in

impacts similar to or likely greater than the Project. For these reasons, we are not recommending the no-action alternative.

1.2 System Alternatives

System alternatives would make use of existing, modified, or planned pipeline systems or projects to meet the objectives of the proposed Project. Use of a system alternative would make it unnecessary to construct all or part of the proposed Project, though some modifications or additions to the existing or planned systems may be required. These modifications or additions could result in environmental impacts that are less than, similar to, or greater than those associated with construction and operation of the Project. We have not identified any system alternatives that could meet the Project purpose.

1.3 Route and Site Alternatives

Route alternatives include those that deviate from the proposed route for a significant distance and provide a substantially different pathway from the source area to the delivery area. Major route alternatives would involve a new pipeline route that would still interconnect with the same existing pipeline systems, potentially at different locations. Minor route variations typically involve minor shifts in the pipeline alignment to avoid a site-specific resource issue or concerns and are generally smaller in scale and shorter than major route alternatives.

Natural plans to locate about 91 percent of the extension pipeline parallel and adjacent to existing utility (pipeline and powerline) right-of-ways along the route. Our review of the proposed Project found that environmental impacts associated with the Project have been adequately minimized. No environmental issues have been identified along the Project route, and we did not receive any site-specific comments or concerns from stakeholders regarding the Project site or route alternatives, nor did we receive any requests from stakeholders for such an evaluation. Because our alternatives analyses are comment and resource driven, we have not identified any route or site alternatives for further analysis.

1.4 Conclusion

We reviewed alternatives to Natural's proposal based on our independent analysis. No system, route, or site alternatives were identified that would provide a significant environmental advantage of the Project design. Therefore, we conclude that the proposed action is the preferred alternative that can meet the Project's objectives.

D: STAFF'S CONCLUSIONS AND RECOMMENDATIONS

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

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

    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary of the Commission (Secretary);
    b. justify each modification relative to site-specific conditions;
    c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
    d. receive approval in writing from the Director of the Office of Energy Projects (OEP) **before using that modification**.

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

    a. the modification of conditions of the Order;
    b. stop-work authority; and
    c. the imposition of any additional measures deemed necessary to ensure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from project construction and operation activities.

3. **Prior to any construction**, Natural shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, environmental inspectors (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**, Natural 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.

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

5. Natural 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 Certificate and before construction** begins, Natural shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Natural must file revisions to the plan as schedules change. The plan shall identify:

   a. how Natural 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 Natural 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 Natural will give to all personnel involved with construction and restoration;
   f. the company personnel (if known) and specific portion of Natural's organization having responsibility for compliance;
   g. the procedures (including use of contract penalties) Natural 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. Natural shall employ at least one EI per construction spread. The EI 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. 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
e. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Natural 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 Natural's efforts to obtain the necessary federal authorizations;
b. the construction status of the project, work planned for the following reporting period, and any schedule changes for 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 Natural from other federal, state, or local permitting agencies concerning instances of noncompliance, and Natural's response.

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

10. Natural must receive written authorization from the Director of OEP **before placing the Project 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 the Project are proceeding satisfactorily.

11. **Within 30 days of placing the authorized facilities in service**, Natural 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 Natural has complied with or will comply with. This statement shall also identify any areas affected by the project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

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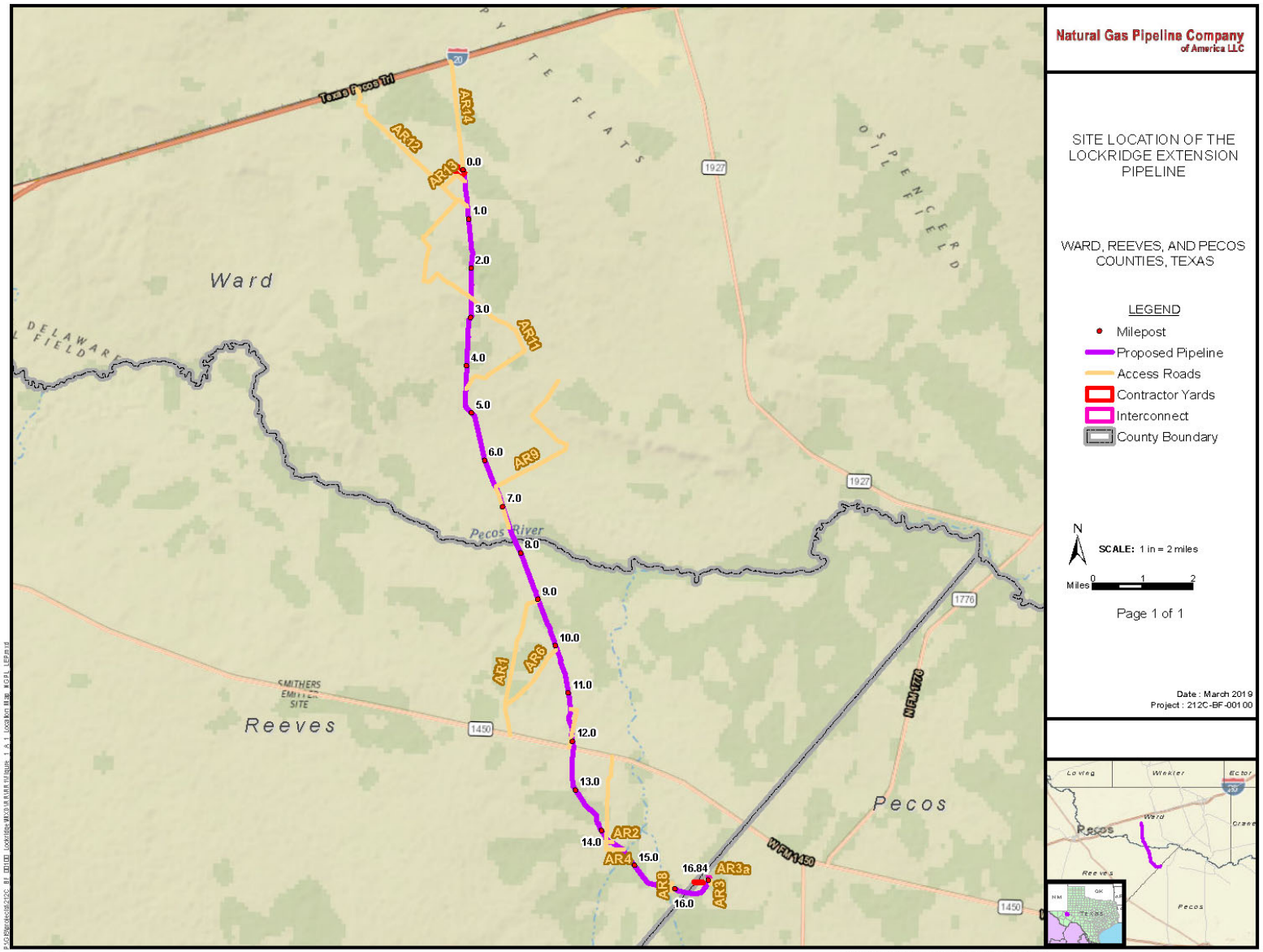
APPENDIX A

Pipeline Route Maps


Natural Gas Pipeline Company
of America LLC
SITE LOCATION OF THE LOCKRIDGE EXTENSION PIPELINE
WARD, REEVES, AND PECOS COUNTIES, TEXAS
LEGEND
Milepost
Proposed Pipeline
Access Roads
Contractor Yards
Interconnect
County Boundary
N
SCALE: 1 in = 2 miles
Miles 0 1 2
Page 1 of 1
Date : March 2019
Project : 212C-BF-00100
Ward
Reeves
Pecos
Pecos River
Texas Pacific Rr
AR14
AR12
AR13
AR11
AR9
AR1
AR6
AR2
AR4
AR8
AR3
AR3a
0.0
1.0
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10.0
11.0
12.0
13.0
14.0
15.0
16.0
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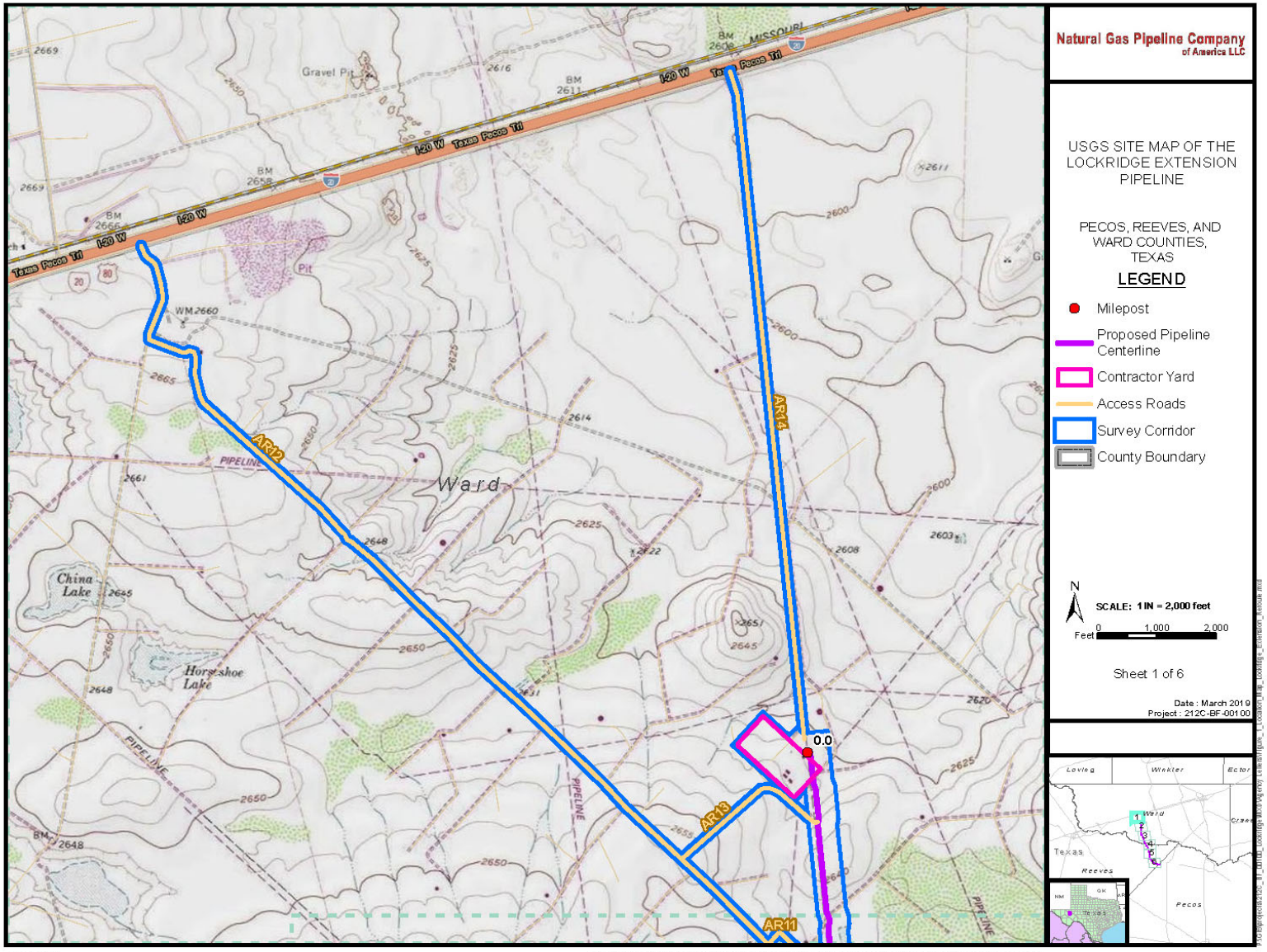
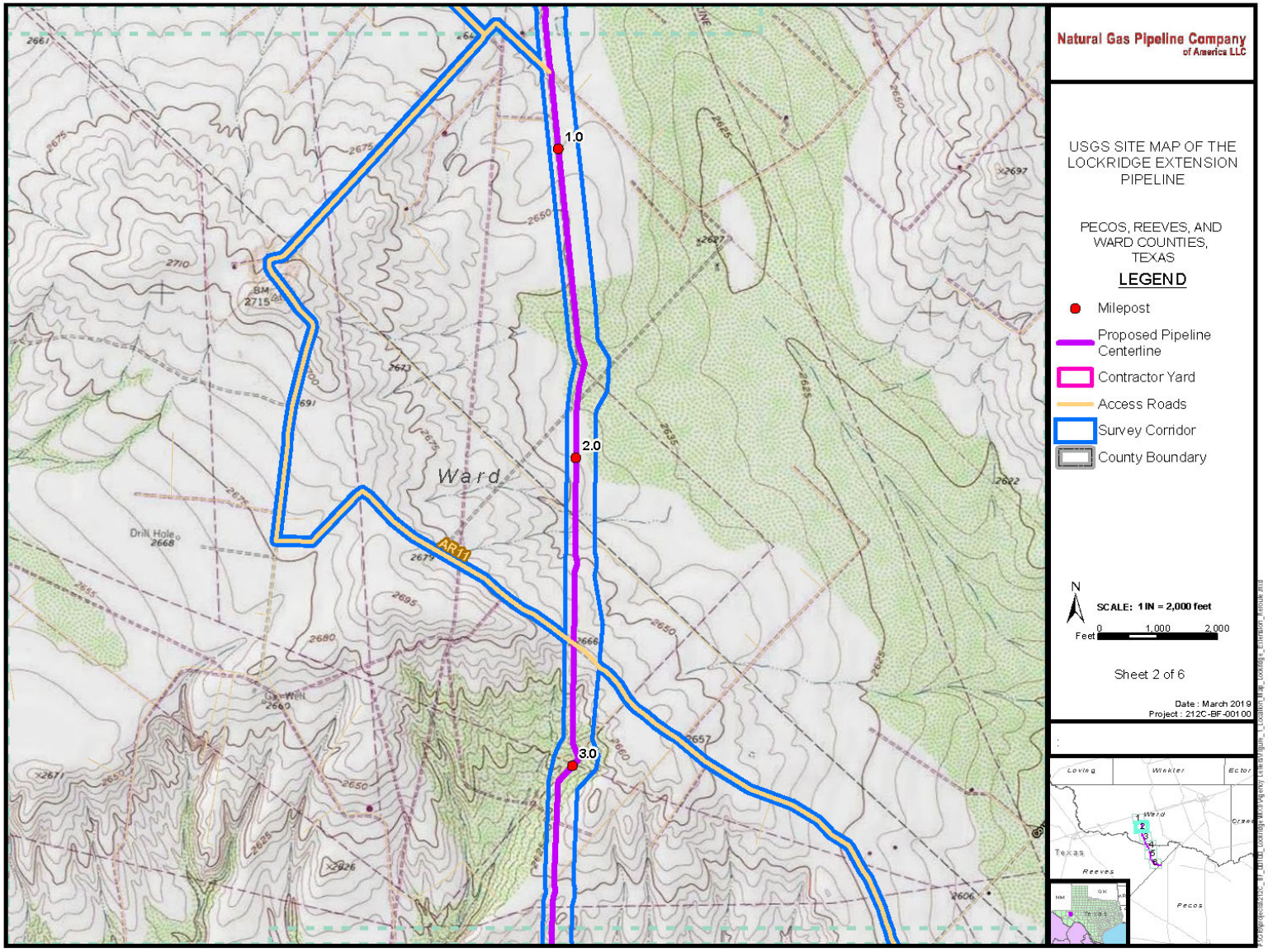
1927
1776
1450
SMITHERS EMITTER SITE
OIL PATCH FIELD
DELAWARE FIELD
Drawn By: S.Lal



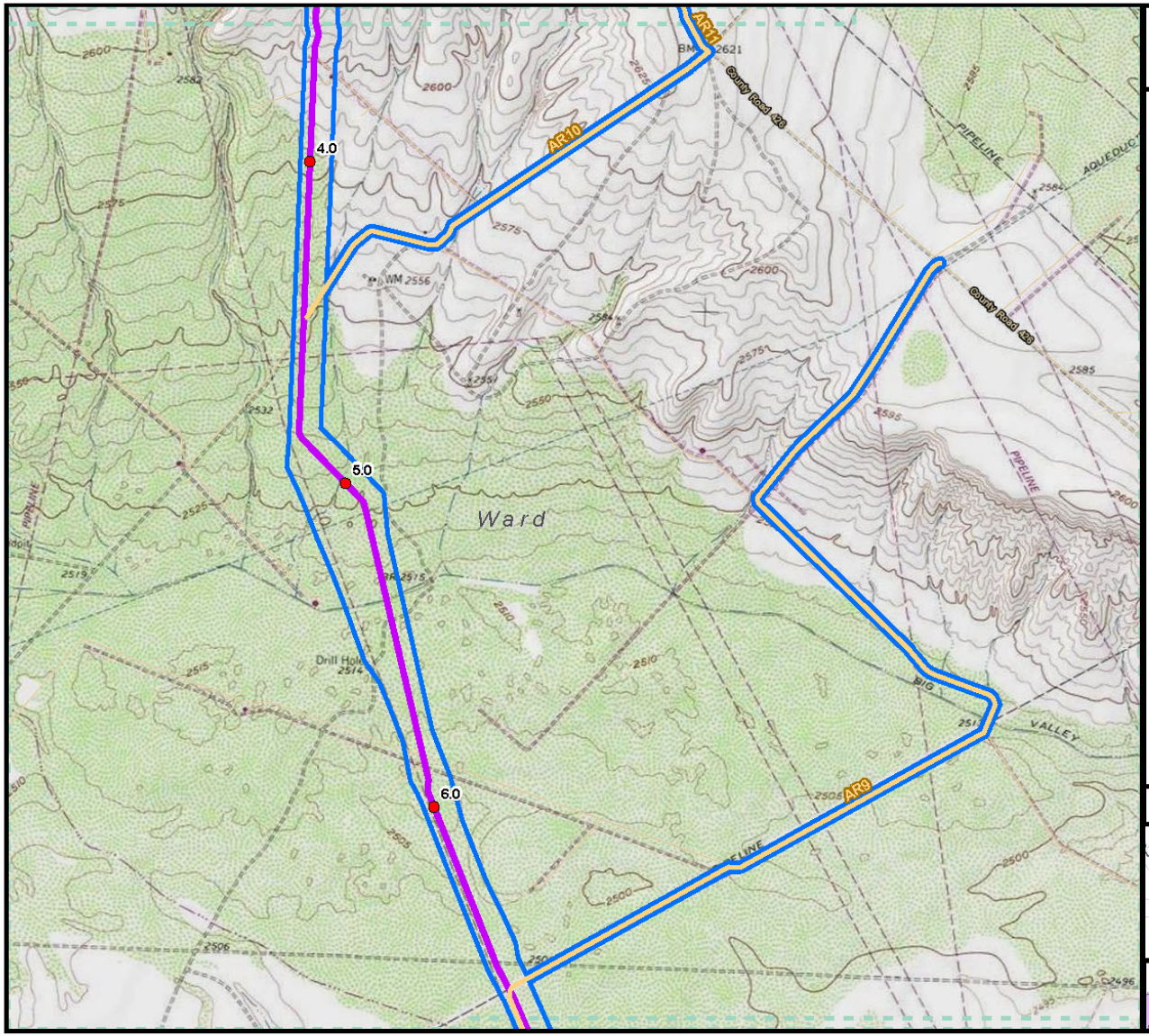
Drawn By: S. Lal

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



Drawn By: S. Lal

Sources: Base Layer - National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P Corp.



Natural Gas Pipeline Company of America LLC

USGS SITE MAP OF THE LOCKRIDGE EXTENSION PIPELINE

PECOS, REEVES, AND WARD COUNTIES, TEXAS

LEGEND

- Milepost
- Proposed Pipeline Centerline
- Contractor Yard
- Access Roads
- Survey Corridor
- County Boundary

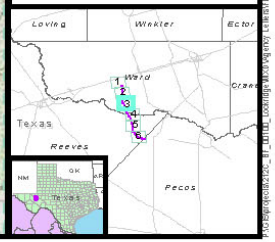
N

SCALE: 1 IN = 2,000 feet

Feet 0 1,000 2,000

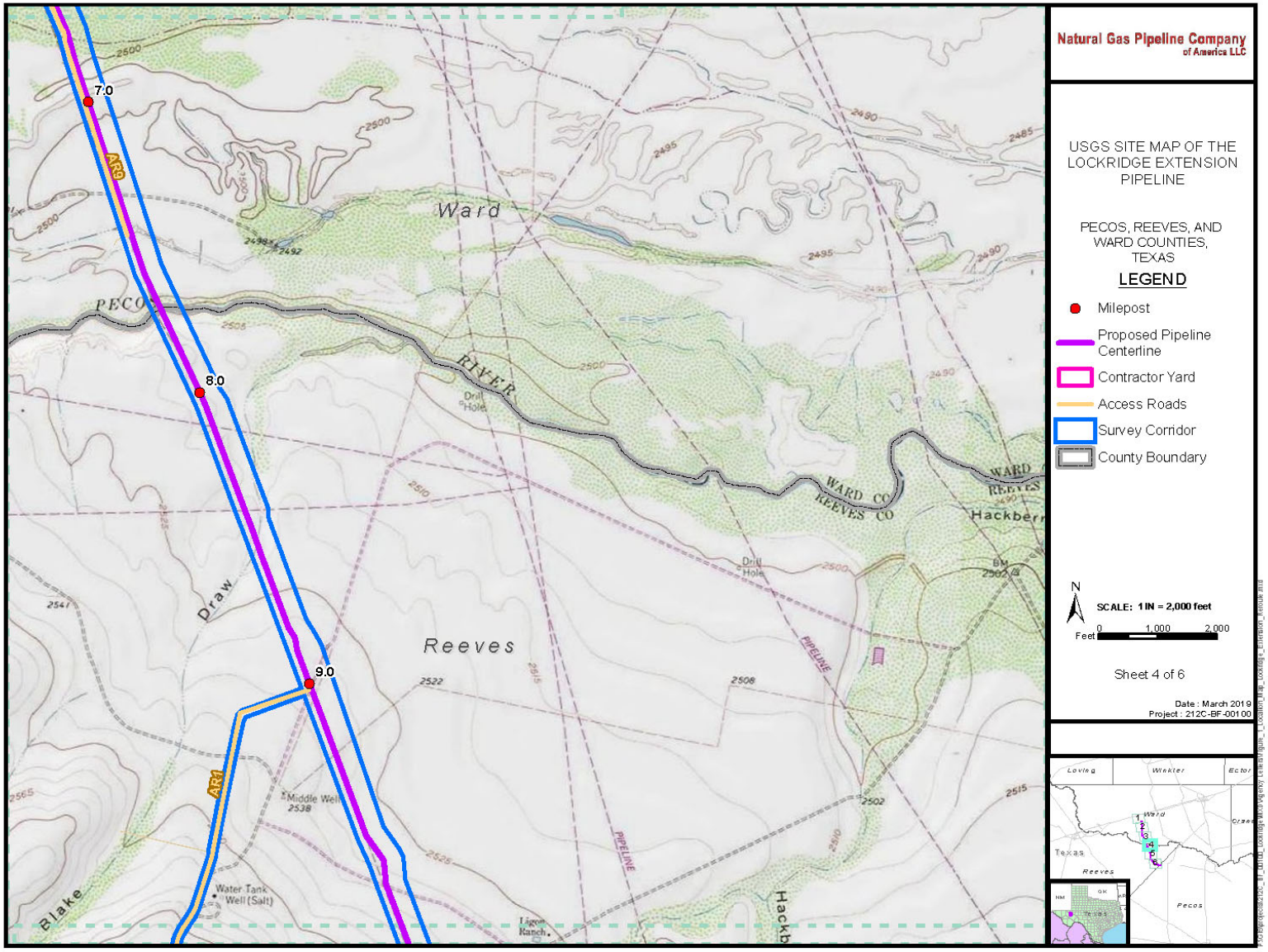
Sheet 3 of 6

Date : March 2019
Project : 212C-BF-00100



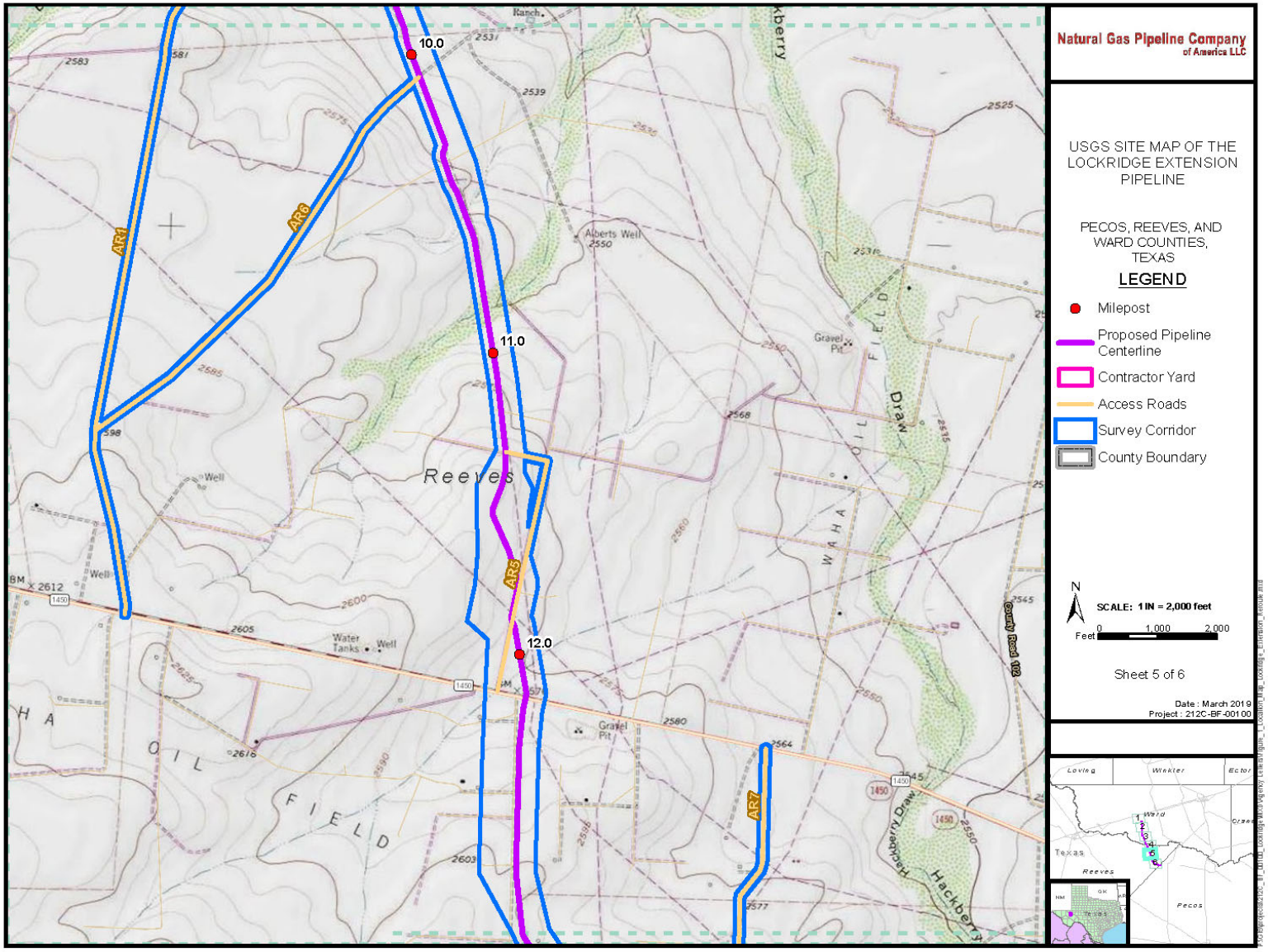
Drawn By: S. Lal

Sources: Base Layer - National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P Corp.



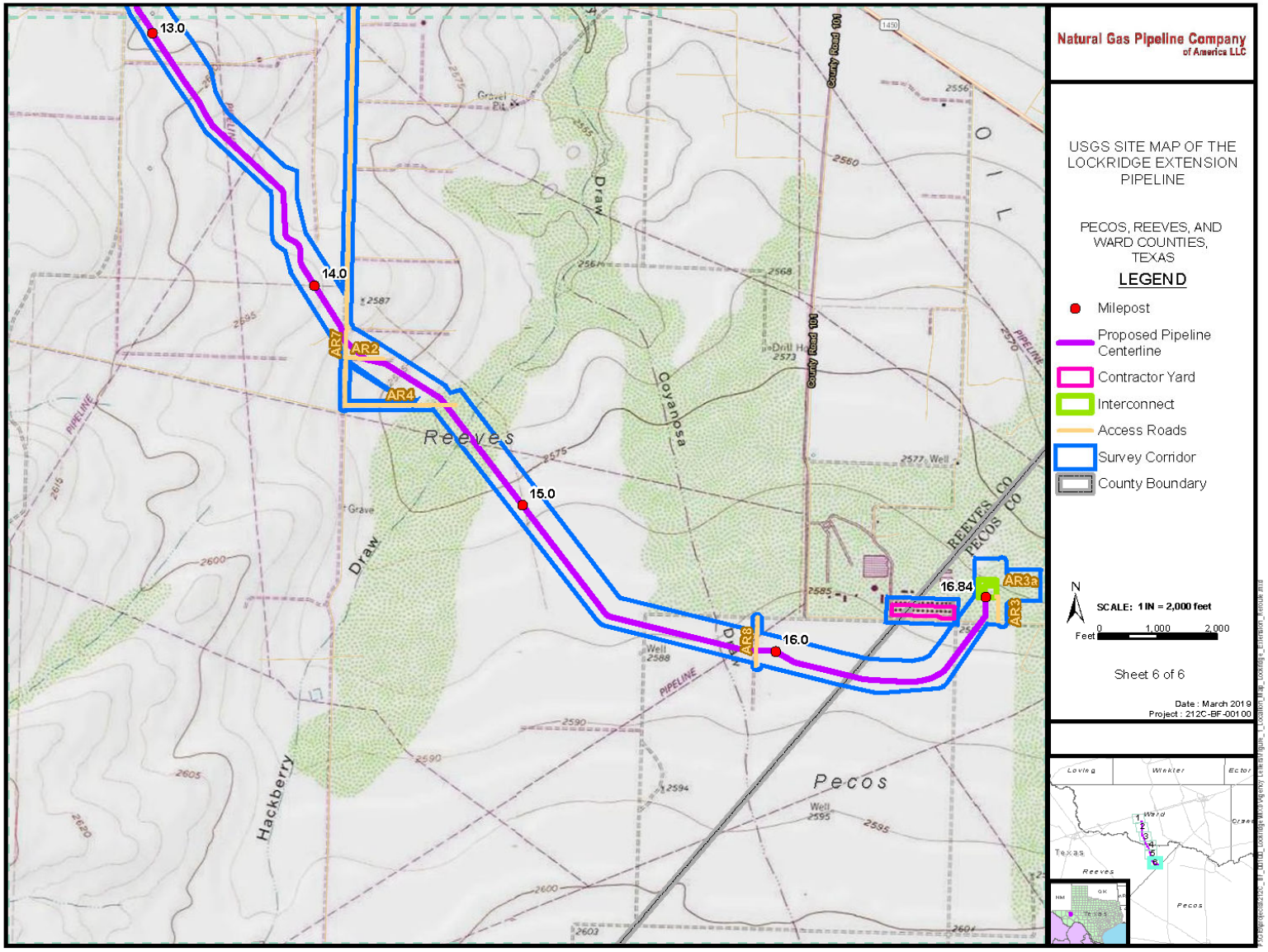
Drawn By: S. Lal

Sources: Base Layer - National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P Corp.



Drawn By: S. Lal

Sources: Base Layer - National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P Corp.


13.0
14.0
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16.0
16.84
AR7
AR2
AR4
AR8
AR3a
AR3
Reeves
Draw
Coyanosa
Hackberry
Pecos
County Road 101
REEVES CO
PECOS CO
PIPELINE
Well
Natural Gas Pipeline Company
of America LLC
USGS SITE MAP OF THE LOCKRIDGE EXTENSION PIPELINE
PECOS, REEVES, AND WARD COUNTIES, TEXAS
LEGEND
Milepost
Proposed Pipeline Centerline
Contractor Yard
Interconnect
Access Roads
Survey Corridor
County Boundary
N
SCALE: 1 IN = 2,000 feet
Feet
0
1,000
2,000
Sheet 6 of 6
Date : March 2019
Project : 212C-BF-00100
Texas
Reeves
Pecos
Drawn By: S. Lal
Sources: Base Layer - National Geographic, Esri, DeLorme, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, Increment P Corp.

APPENDIX B

Federally- and State-listed Species Potentially Occurring in the Vicinity of the Project

	Table B-1 **Federally- and State-listed Species Potentially Occurring in the Vicinity of the Project**				
Common Name	Scientific name	Federal Status	State Status	County	Determination
Black bear	*Ursus americanus*	Not listed	Threatened	Ward, Reeves, Pecos	*No effect*
Gray wolf	*Canis lupus*	Endangered	Endangered	Ward, Reeves, Pecos	*No effect*
American peregrine flacon	*Falco peregrinus anatum*	De-listed	Threatened	Ward, Reeves, Pecos	*No effect*
Bald eagle	Haliaeetus *leucocephalus*	Delisted	Threatened	Ward	*No effect*
Black-capped vireo	*Vireo atricapilla*	De-listed	Endangered	Pecos	*No effect*
Interior least tern	*Sternula an um athalassos*	Endangered	Endangered	Ward, Reeves, Pecos	*No effect*
Mexican spotted owl	*Strix o talis lucida*	Threatened	Threatened	Reeves, Pecos	*No effect*
Northern aplomado falcon	*Falco femoralis septentrionalis*	Endangered	Endangered	Ward, Reeves, Pecos	*No effect*
Peregrine falcon	*Falco peregrinus*	Not listed	Threatened	Ward, Reeves, Pecos	*No effect*
Piping plover	*Charadrius melodus*	Threatened	Threatened	Ward, Reeves, Pecos	*No effect*
Red knot	*Calidris canutus rufa*	Threatened	Not listed	Ward, Reeves, Pecos	*No effect*
Reddish egret	*Egretta rufescens*	Not listed	Threatened	Reeves, Pecos	*No effect*
Zone-tailed hawk	*Buteo albonotatus*	Not listed	Threatened	Reeves, Pecos	*No effect*

	Table B-1 **Federally- and State-listed Species Potentially Occurring in the Vicinity of the Project**				
Common Name	Scientific name	Federal Status	State Status	County	Determination
Texas-horned lizard	*Phrynosoma cornutum*	Not listed	Threatened	Ward, Reeves, Pecos	*No effect*
Trans-Pecos black-headed snake	*Tantilla cucullata*	Not listed	Threatened	Pecos	*No effect*
Comanche Springs pupfish	*Cyprinodon elegans*	Endangered	Endangered	Reeves, Pecos	*No effect*
Leon Springs pupfish	*Cyprinodon bovinus*	Endangered	Endangered	Pecos	*No effect*
Pecos gambusia	*Gambusia nobilis*	Endangered	Endangered	Reeves, Pecos	*No effect*
Pecos pupfish	*Cyprinodon pecosensis*	Under review	Threatened	Ward, Reeves, Pecos	*No effect*
Proserpine shiner	*Cyprinella proserpina*	Not listed	Threatened	Pecos	*No effect*
Rio Grande silvery minnow	*Hybognathus amarus*	Endangered	Endangered	Reeves, Pecos	*No effect*
Diminutive amphipod	*Gammarus hyalelloides*	Endangered	Not listed	Ward, Reeves, Pecos	*No effect*
Pecos amphipod	*Gammarus pecos*	Endangered	Not listed	Pecos	*No effect*
Diamond tryonia	*Tryonia adamantina*	Endangered	Not listed	Pecos	*No effect*
Gonzales tryonia	*Tryonia circumstriata*	Endangered	Not listed	Pecos	*No effect*

	Table B-1 **Federally- and State-listed Species Potentially Occurring in the Vicinity of the Project**				
Common Name	Scientific name	Federal Status	State Status	County	Determination
Pecos assiminea snail	*Assiminea pecos*	Endangered	Endangered	Reeves, Pecos	*No effect*
Phantom springsnail	*Pyrgulopsis texana*	Endangered	Not listed	Reeves	*No effect*
Phantom tryonia	*Tryonia cheatumi*	Endangered	Not listed	Reeves	*No effect*
Texas hornshell	*Popenaias popeii*	Endangered	Threatened	Ward, Reeves, Pecos	*No effect*
Lloyd's mariposa	*Sclerocactus mariposensis*	Threatened	Threatened	Pecos	*No effect*
Pecos sunflower	*Helianthus paradoxus*	Threatened	Threatened	Reeves, Pecos	*No effect*

APPENDIX C

Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Table C-1)

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Kinder Morgan Major Projects							
Gulf Coast Express Pipeline Project (GCX Project) Kinder Morgan, DCP Midstream, Targa Resources	Project Mainline is approximately 447.5 miles of 42-inch diameter pipeline originating at the Waha Hub and terminating near Aqua Dulce, TX. Project includes four compressor stations including, GCX Waha Compressor Station, which is the only compressor station within any applicable resource CIAA. Project includes GCX Midland Lateral - 50 miles of 36-inch diameter pipeline and associated compression, also located outside CIAA.	Pecos, Crane, Upton, Reagan, Midland, Glasscock, Reagan, Crockett, Val Verde, Kinney, Maverick, Zavala, Dimmit, La Salle, McMullen, Duval, Jim Wells, Nueces	0.78 SE of MP 16.50	Present Under construction; anticipated in service: 2019	Approximately 2.37 miles in CIAA covering an estimated 35.91 acres based on 125-foot construction ROW.	Railroad Commission of Texas (TRRC): Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation, Land Use
Permian Highway Pipeline Project Kinder Morgan Texas Pipeline	Construction of approximately 430 miles of 42-inch diameter pipeline, from Waha in West Texas to Katy, outside of Houston,	Reeves, Pecos, Blanco, Caldwell, Colorado, Crane, Crockett,	0.43 S of MP 16.50	Future Anticipated in service by end of 2020	Approximately 8.19 miles in CIAA covering an estimated 124.09 acres (based on 125-	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans	Water Use & Quality (HUC 12), Wildlife and Vegetation, Geology, Soils,

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
LLC	with connections to the Gulf Coast and Mexico markets.	Fayette, Gillespie, Gonzales, Hays, Kimble, Lavaca, Menard, Reagan, Schleicher, Upton			foot wide construction ROW)	and conditions require: USFWS, USACE (NWP-12), THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Land Use

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Kinder Morgan – Natural and El Paso Natural Gas Company ("EPNG") Minor Projects[a]							
Waha Connector Ward C NGPL-Whitewater Midstream Company Waha Connector Ward C	Install a new 540 MMcf/d bi-directional interconnect on the 30-inch Permian Line No. 1.	Ward	0.04 N of MP 0.0	Past Completed in 2018	Footprint: limits of disturbance during construction approximately 1 acre.	TRRC Oversight and Safety Division T-4 Permit; Prepared Biological Assessment	Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources
Waha Delivery Lateral EPNG	Install 3,100 feet of new 30- inch diameter pipe.	Reeves	0.14 NE of MP 16.84	Past Completed in 2018	Footprint: limits of disturbance during construction approximately 5.3 acres.	TRRC Oversight and Safety Division T-4 Permit. Project is subject to FERC environmental requirements.	Wildlife and Vegetation, Air, Noise, Geology, Soils, Land Use
Aqua Blanca Receipt Meter Station	Install a full build receipt meter station for Whitewater Midstream Company.	Pecos	0.15 miles N of MP16.84	Past Completed in 2018	Footprint: limits of disturbance during construction not to exceed 1 acre.	TRRC Oversight and Safety Division T-4 Permit. Project is subject to FERC environmental requirements.	Wildlife and Vegetation, Air, Noise, Geology, Soils, Land Use

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
						Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
EPNG-Line 3160 Repair or Replace	Repair or replace two locations along Line 3160.	Pecos	0.91 and 1.34 SE of MP 16.50	Past Completed in 2018	Footprint for each repair segment: 200 x 60 feet (0.27 acre); total of 0.54 acre.	2.55(b)	Wildlife and Vegetation, Land Use
EPNG-Line 3160 Remediation	Remediation on Line 3160 a 16-inch diameter pipe Segment form Gomez Field to EPNG Waha Plant. One remediation location within the CIAA.	Pecos	2.42 SE of MP 16.55	Past Completed in 2018	Footprint for limits of disturbance during remediation approximately 0.27 acre.	2.55(b)	Wildlife and Vegetation
Oil and Gas Projects[b]							
Comanche Trail Pipeline, Comanche Trail Pipeline, LLC	Construction of 195 miles of 42-inch-diameter intrastate pipeline, including associated facilities, compression, and header and lateral pipelines.	Pecos, Reeves, Culberson, Hudspeth, El Paso	Crosses Project at MP 14.73 and 0.07 N of MP 16.84	Past In service January 30, 2017	Approximately 5.93 miles in CIAA covering an estimated 89.85 acres (Project has a 125-foot wide construction ROW). Project affected a	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE (NWP-12), THC, TCEQ,	Water Use & Quality (HUC 12), Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
					total of approximately 3,000 acres of land during construction, with about 1,180 acres maintained as permanent operational ROW.	TPWD, TXGLO, SHPO, THPO	

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Roadrunner Gas Transmission Pipeline Oneok Partners	Construction in three phases, includes 200 miles of new 30-inch diameter natural gas pipeline extending from the Permian Basin in West Texas to Mexico. (Phase 1 is complete and only portion of project within CIAA).	Ward, Reeves, Culberson, Hudspeth, El Paso	Crosses Project at MP 13.74	Present Construction began in 2015; anticipated in-service: 2019	Approximately 8.81 miles in CIAA covering an estimated 117.47 acres (based on assumed 110-foot wide construction ROW)	TRRC jurisdiction and oversight USACE Section 404 (NWP 12) Spring 2015: concluded environmental and cultural resources surveys and submitted major permit applications to federal, state, and local agencies.	Water Use & Quality (HUC 12), Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources
Trans-Pecos Pipeline Energy Transfer Partners, L.P.	Construction of 148-mile, 42-inch diameter natural gas pipeline extending from Pecos County to the Rio Grande.	Pecos, Brewster, Presidio	0.70 SW MP 16.70	Past In service March 31, 2017	Approximately 3.19 miles in CIAA covering an estimated 48.33 acres (Project has 125-foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation, Land Use

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Orla Gas Processing Plant to Waha Hub Enterprise Products Partners LP	Construction of 67.5-mile 36-inch pipeline extending from the processing plant in Orla, Texas in Reeves County to the Waha Hub.	Reeves, Ward, Pecos	Crosses Project at MP 3.54, 0.75 NE of MP 10.65, 0.57 NE of MP 16.84	Present In service second quarter of 2018	Approximately 18.57 miles in CIAA covering an estimated 247.60 acres (based on assumed 110-foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Agua Blanca Pipeline Whitewater Midstream	Approximately 90 miles of 36-inch diameter pipeline and approximately 72 miles of 12- to 24-inch diameter pipeline. Pipeline extends from Orla, TX to the Waha Hub	Culberson, Loving, Pecos, Reeves, Ward	0.14 W of MP 0.20	Present In-service anticipated in third quarter of 2019	Approximately 3.20 miles in CIAA covering an estimated 42.67 acres (based on assumed 110-foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise
Red Bluff Express Pipeline, LLC Energy Transfer Partners	Approximately 80 miles of 30-, 36- and 42-inch pipeline. The System would extend through the Delaware Basin and interconnects the Red Bluff and Orla Processing Plants to the Waha Oasis Header.	Reeves	Crosses Project at MP 12.22 & 0.52 NE of MP 16.84	Present In service anticipated in second half of 2019	Approximately 9.40 miles in CIAA covering an estimated 48.48 acres (based on assumed 125-foot wide construction ROW)	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Pecos Trail Pipeline Namerico Partners, partnership with Cresta Energy Fund I LP	Approximately 468-mile 42- inch diameter natural gas pipeline transporting to the Aqua Dulce Hub, Corpus Christi, TX.	Reeves Pecos, Crane, Upton, Crockett, Val Verde, Kinney, Maverick, Zavala, Dimmit, La Salle, McMullen, Live Oak, San Patricio	1.66 SE of MP 16.84	Present In-service anticipated in third quarter of 2019	Approximately 1.37 miles in CIAA covering an estimated 20.76 acres (based on 125- foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Permian-Katy ("P2K") Gas Pipeline Sempra Energy and Boardwalk Pipeline Partners	Approximately 520-mile, 42- and 36-inch pipeline project proposed to transport natural gas from Waha Head Headers in the Permian Basin to Katy and the Houston Ship Channel.	Pecos Crane, Upton, Reagan, Irion, Tom Green, Schleicher, Menard, McCulloch, San Saba, Burnet, Williamson, Lee, Washington, Austin, Waller, Wharton	1.13 S of MP 16.30	Future Anticipated in service third quarter of 2020	Approximately 3.34 miles in CIAA covering an estimated 50.61 acres (based on assumed 125-foot wide construction ROW)	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USACE section 404 (NWP 12) including environmental and cultural resources surveys and submission of permit applications to federal, state, and local agencies (USFWS, THC, TCEQ, TPWD, TXGLO, SHPO, THPO).	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Double E Natural Gas Pipeline Summit Midstream Partners, LP	Consists of 120 miles of 24- and 36-inch diameter natural gas pipeline, connecting Northern Delaware Basin to Waha Hub.	Ward, Reeves, Pecos, Loving, TX; Eddy and Lea NM	Crosses Project at MP 3.70 & 0.56 NE of MP 9.83, 0.44 NE of MP 16.84	Future Anticipated in service first quarter of 2021	Approximately 18.60 miles in CIAA covering an estimated 248.00 acres (based on assumed 110-foot wide construction ROW)	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Waha Header Energy Transfer Partners, L.P.	Located near the Waha Hub is designed to accommodate 6 billion cubic feet/day and connects to more than 10 natural gas pipelines including Trans-Pecos and Comanche Trail.	Pecos, Ward, Reeves	0.18 NE of MP 16.84	Past In service January 30, 2017	Approximately 3.11 miles in CIAA	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources
Big Tex Gathering System Oryx So. Delaware OGT, LLC	Approximately 23.5 miles of 12.75-inch diameter oil pipeline.	Reeves, Pecos	1.57 SW of MP 13.20	Present Construction commenced June 30, 2017 In Service anticipated in 2018	Approximately 3.60 miles in CIAA covering an estimated 34.91 acres (based on assumed 80-foot wide construction ROW)	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Arrowhead to Waha Pipeline Energy Transfer Company	Construction of 5.05 miles of 20-inch diameter natural gas liquids pipeline starting at Arrowhead Gas Plant to Waha Gas Plant.	Reeves, Pecos	Parallel to Project: 0.25 SW and S of MP 14.76 to MP 16.45	Present RRR approval obtained March 3, 2017	Approximately 5.05 miles in CIAA covering an estimated 48.97 acres (based on assumed 80-foot wide construction ROW)	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO.	Wildlife and Vegetation, Geology, Soils, Land Use

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Lariat Gathering Pipeline Vaquero Permian Midstream	Construction of approximately 77 miles of 24- and 30- inch diameter rich natural gas pipeline starting near the town of Orla extending to Waha Gas. Consists of Lariat 1 (20miles), Lariat 2 (5 miles),and Lariat 3 (52 miles). Lariat 1 and Lariat 2 are the only portions of the project within CIAA.	Reeves, Pecos	Crosses Project at MP 13.68; Parallel to Project: 0.20 SW of MP 13.36 to MP 13.66	Past In service January 2016	Approximately 9.92 miles in CIAA covering an estimated 132.27 acres (based on assumed 110-foot wide construction ROW)	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO.	Water Use & Quality (HUC 12), Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources
Vaquero Junction to Waha Plant Pipeline	Construction of approximately 7 miles of 12- inch diameter pipeline natural gas liquids pipeline.	Reeves, Pecos	1.07 SE of MP 16.84	Past Construction start date of: March 16, 2016	Approximately 3.62 miles in CIAA covering an estimated 35.10 acres (based on assumed 80-foot wide construction ROW)	Anticipated TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Whistler Pipeline Project NextEra Energy, Targa and Whitewater	Construction of approximately 450 miles of 42-inch-diameter pipeline from the Waha Hub in the Permian Basin to the NextEra Agua Dulce market hub in South Texas	Reeves, Pecos, Crane, Crockett, Dimmit, Duval, Jim Wells, Kinney, La Salle, Maverick, McMullen, Nueces, Reagan, Upton, Val Verde, Ward, Zavala	2.36 N of MP 16.84	Future: In service anticipated by end of 2020	Approximately 2.18 miles in CIAA covering an estimated 33.03 acres (based on 125- foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE (NWP-12), THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation
Permian Global Access Pipeline Tellurian Inc.	Construction of approximately 625-mile, 42- inch diameter pipeline originating at the Waha Hub in Pecos County, Texas, and terminate near Gillis, Louisiana.	Pecos, Concho, Coryell, Crane, Falls, Houston, Irion, Jasper, Lampasas, Leon, Limestone, McCulloch, McLennan, Mills, Newton, Polk, San Saba, Tom Green, Trinity, Tyler, Upton, TX; – Beauregard,	0.48 NE of MP 16.84	Future: In service anticipated by end of 2022	Approximately 2.74 miles in CIAA covering an estimated 41.51 acres (based on 125- foot wide construction ROW)	FERC Certificate; TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE (NWP-12), THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation, Geology, Soils, Land Use

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
		Allen, Jefferson Davis, LA,					

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Oahu Lateral Whitewater Midstream Operating, LLC	Construction of approximately 6.6-mile, 12.75-inch diameter natural gas pipeline.	Pecos	1.07 E of MP 16.84	Past In service October 1,2018	Approximately 2.14 miles in CIAA covering an estimated 20.75 acres (based on 80- foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE (NWP-12), THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Pecos System – DP2 20-inch Pipeline Dew Point Midstream, LLC	Construction of approximately 31.12-mile 20-inch natural gas liquids pipeline.	Reeves, Pecos	Crosses at MP 12.54	Past In service September 28, 2018	Approximately 6.44 miles in CIAA covering an estimated 74.16 acres (based on 95- foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Aqua Blanca High Pressure Header Whitewater Midstream Operating, LLC	1.8-mile 24-inch pipeline	Pecos	0.19 N of MP 16.84	Present Anticipated in service February 15, 2019	Approximately 1.12 miles in CIAA covering an estimated 12.90 acres (based on 95-foot wide construction ROW)	TRRC Oversight and Safety Division T-4 Permit; Environmental review by the following agencies as project plans and conditions require: USFWS, USACE, THC, TCEQ, TPWD, TXGLO, SHPO, THPO	Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise
Commercial/Industrial/Residential/Municipal Development[c]							
None							
Texas Department of Transportation (TxDOT) Projects							
TxDOT Project No. 000402058	Reconstruct 15.6 miles of pavement along Interstate 20 from Pecos River to 1.5 miles west of FM 1927. Facility upgrades to meet freeway standards.	Ward	2.2 miles N of MP 0.0	Present Finalizing for Construction in TBD/2018	Project footprint: 15.6 miles covering an estimated 151 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation
TxDOT Project No. 000402059	Reseal and coat roadway along Interstate 20 from Pecos River to 1.3 miles	Ward	2.2 miles N of MP 0.0	Future Finalizing for Construction in	Project footprint: 16.6 miles covering an estimated 161	Statewide Transportation Improvement Program. TxDOT-Environmental	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
	west of FM 1927.			TBD/2020	acres.	Affairs Division.	
TxDOT Project No. 000402060	Install median barriers along Interstate 20 from Pecos River (Reeves County line) to 1.3 miles west of FM 1927.	Ward	2.2 miles N of MP 0.0	Present Finalizing for Construction in 2019	Project footprint: 16.6 miles covering an estimated 161 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
TxDOT Project No. 163901015	Reseal and coat roadway (FM 1450) from location 5 miles east of US 285 to Pecos County Line for project length of 18.7 miles.	Reeves	Crosses at MP 12.14	Past Construction estimated complete date 6/25/2018	Project footprint: 18.7 miles covering an estimated 68 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Water Use & Quality (HUC 12), Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources
TxDOT Project No. 163901016	Preventive maintenance: mill and fill roadway (FM 1450) from location 8 miles east of US 285 to Pecos County Line for project length of 15.7 miles.	Reeves	Crosses at MP 12.14	Future Finalizing for Construction in TBD/2020	Project footprint: 15.7 miles covering an estimated 57 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Water Use & Quality (HUC 12), Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources
TxDOT Project No. 163902019	Preventive maintenance: mill and fill roadway (FM 1450) from Pecos County Line southeastward to FM 1776 for project length of 1.8 miles.	Pecos	1.4 miles NE of MP 16.84	Future Finalizing for Construction in TBD/2020	Project footprint: 1.8 miles covering an estimated 6.5 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
TxDOT Project No. 226202013	Roadway reconstruction and reconfigure intersection on FM 1776. Project length is 2 miles extending from 2 miles north of FM 1450 to FM 1450.	Pecos	2.4 miles from MP 16.84	Future In development anticipated construction TBD/2023	Project footprint: 2 miles covering an estimated 7 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
TxDOT Project No. 226202014	Milled edgeline and centerline rumble strips on roadway (FM 1776). Project length is 7.1 miles from Ward County line to FM 1450.	Pecos	2.4 miles ENE of MP 16.84	Past Construction scheduled for 2017. Estimated complete date 4/13/2018	Project footprint: 7.1 miles covering an estimated 26 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation
TxDOT Project No. 226202015	Reseal and coat roadway (FM 1776). Project length is 7.1 miles from Ward County line to FM 1450.	Pecos	2.4 miles ENE of MP 16.84	Future In development anticipated construction TBD/2020	Project footprint: 7.1 miles covering an estimated 26 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation
TxDOT Project No. 226203014	Roadway reconstruction and reconfigure intersection on FM 1776. Project length is 4 miles extending from FM 1450 to 4 miles south of FM 1450.	Pecos	1.9 miles from MP 16.84	Future In development anticipated construction TBD/2022	Project footprint: 4 miles covering an estimated 14.5 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
TxDOT Project Nos. 226203015 & 226203016	Reseal, coat, and mill edgeline and centerline rumble strips on roadway along FM 1776. Project length is 19.4 miles from FM 1450 to US 285.	Pecos	1.8 miles E of MP 16.84	Past Construction scheduled for 2017. Estimated complete date: 6/25/2018	Project footprint: 19.4 miles covering an estimated 71 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
TxDOT Project No. 163902017	Reseal and coat roadway (FM 1450) from Reeves County line along FM 1450 to 2 miles east of Reeves County line for project length of 2 miles.	Pecos	1.3 miles NE of MP 16.84	Past Construction scheduled for 2017. Estimated complete date 6/25/2018	Project footprint: 2 miles covering an estimated 7 acres.	Statewide Transportation Improvement Program. TxDOT-Environmental Affairs Division.	Wildlife and Vegetation
Unrelated Project (Energy & Utility) (*include other linear projects –e.g., process water pipelines, electric transmission)* [d]							
None						ND	
Oil & Gas Production Wells [e]							
Wells, 0.5-mile CIAA in Ward County, TX	There are 528 wells within 3 miles of the Project in Ward County. A total of 68 wells are located within 0.5 mile of the Project construction workspace. Of these 68 wells, four were permitted between 2015 and though current data for 2018. The four wells that were constructed or permitted during this time span are considered in the CIAA.	Ward	Varies	Past, Present, and Future	Varies	TRRC oversight, review and project compliance pursuant to TAC Title 16, Part 1, Chapter 3	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
Wells, 0.5-mile CIAA in Reeves County, TX	There are 367 wells within 3 miles of the Project in Reeves County. A total of 76 wells located within 0.5 mile of the Project construction workspace. Of these 76 wells, five were permitted between 2015 and though current data for 2018. The five wells that were constructed or permitted during this time span are considered in the CIAA.	Reeves	Varies	Past, Present, and Future	Varies	TRRC oversight, review and project compliance pursuant to TAC Title 16, Part 1, Chapter 3	Water Use & Quality (HUC 12), Fish, Wildlife and Vegetation, Geology, Soils, Land Use, Air, Noise, Cultural Resources
Wells, 0.5-mile CIAA in Pecos County, TX	There are a total of 21 wells within 3 miles of the Project in Pecos County. Four wells are located within 0.5 mile of the Project construction workspace. Of these four wells, no wells were permitted or	Pecos	Varies	Past, Present, and Future	Varies	TRRC oversight, review and project compliance pursuant to TAC Title 16, Part 1, Chapter 3	NA

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
	constructed between 2015 and though current data for 2018; therefore, no wells were considered in the CIAA within Pecos County.						

Notes:
N/A = not applicable.; EPNG=El Paso Natural Gas Company, ETC=Energy Transfer Company

a Minor projects such as those listed here are generally authorized either under Blanket Authority (in accordance with Section 7 of the Natural Gas Act) because they would have relatively little impact on ratepayers, operations, or the environment, or are further exempt from Section 7(c) authority because the pipe, ROW, and environmental conditions have already been certificated. Section 2.55(a) authorizes auxiliary installations for obtaining more efficient or economical operation and Section 2.55(b) authorizes replacements of physically deteriorated or obsolete facilities with equivalent designed delivery capacity. These projects should be completed in the near term.

b Projects recently completed, under construction, or expected to be under construction in the same timeframe as, and located within the CIAA of, the Lockridge Extension Pipeline.

c Land Use Information Request Letters were sent to the County Clerk and Commissioner of Ward, Reeves, and Pecos Counties as well as the Permian Basin Regional Planning Commission. No projects reported via response letter from Permian Basin Planning Commission. Correspondence is included in Resource Report 8, Appendix 8-A (see Volume I Public).

d Oncor Electric Delivery Company LLC's Riverton-Sand Lake 345 kV Transmission Line Project is outside of the CIAA boundary. This project includes proposed Riverton Switching Station, located in Reeves County along County Road 440 east of US 285, to the proposed Sand Lake Switching Station approximately 6 miles northeast of Pecos, Texas on the northwest side FM 3398 in Ward County. Source: Public Utility Commission of Texas Docket No 47368 at http://www.oncor.com/en/Documents/About%20Oncor/Transmission/R-SL%20Notice(for%20website).pdf.

e Well drilling activity within the same counties Ward, Reeves, and Pecos Counties) as the Lockridge Project. Sources:

- FERC eLibrary accessed at https://www.ferc.gov/docs-filing/elibrary.asp (CP15-500 Trans-Pecos Pipeline, LLC – Presidio Border Crossing Project (FERC EA January 2016); CP15-503 Comanche Trail Pipeline, LLC – San Elizario Crossing Project (FERC EA January 2016).
- EIA Pipeline projects data accessed at https://www.eia.gov/naturalgas/data.php#pipelines and www.eia.gov/state/maps.php/v=Petroleum).
- TRCC: Publicly available information (including pipeline and Oil and Gas Well records and permits) accessed at http://www.rrc.state.tx.us/pipeline-safety/permitting/new-permits/; http://www.rrc.state.tx.us/oil-gas/research-and-statistics/obtaining-commission-records/oil-and-gas-well-records/; and http://www.rrc.state.tx.us/about-us/resource-center/research/gis-viewers/ Additional GIS pipeline and well data purchased from the TRCC.
- TxDOT Project Tracker accessed at https://www.txdot.gov/inside-txdot/projects/project-tracker.html.
- Oil and Gas Industry websites:

https://www.enterpriseproducts.com/about-us/system-map
http://whitewatermidstream.com/agua-blanca-project-viewer
http://p2kpipeline.com/
https://www.crestwoodlp.com/operations/Current-Projects/default.aspx
https://www.kindermorgan.com/content/docs/Gulf_Coast_Express_fact_sheet.pdf

Table C-1. Cumulative Impacts within the Same Geographic Scope and Timeframe as the Project (Continued)

Project	Primary Elements/ Description	Location (County)	Distance (miles)/ Direction to Nearest Project MP	Current Status and Schedule	Footprint/Layout and Anticipated Impacts	Permits and Authorizations/ Description of Environmental Review, if required	Applicable Resource CIAA (Potentially Affected Resource Areas)
https://www.kindermorgan.com/pages/business/gas_pipelines/projects/php/ https://www.oneok.com/~/media/ONEOKPartners/NewsRoom/PressKits/Roadrunner/FactSheet .ashx http://www.oneok.com/~/media/ONEOKPartners/SystemMaps/RoadRunner_PipelineMeters-2.ashx http://ir.targaresources.com/static-files/31900e12-dbb2-49e4-b243-958f84789611 https://rbnenergy.com/ https://rbnenergy.com/you-send-me-vaqueros-integrated-plan-for-moving-and-processing-rich-gas-from-the-permian https://www.naturalgasintel.com/articles/115322-proposed-whistler-pipeline-to-move-2-bcf-from-permian-to-texas-coast https://ir.tellurianinc.com/press-releases/detail/188/tellurian-announces-intent-to-develop-three-pipelines-as https://www.naturalgasintel.com/articles/115681-permian-highway-project-advancing-to-move-2-bcfd-to-gulf-coast-and-beyond https://www.energytransfer.com/docs/mainpage/2018-ETE-ETP-MLPA-Conference-Presentation_Final.pdf							
f https://www.reuters.com/article/us-namerico-partners-pipeline/exclusive-namerico-unveils-natural-gas-pipeline-plan-to-relieve-permian-glut-idUSKBN1750CW https://www.apnews.com/1d10a49f4c5e4a0fa419e10301c0ed39							