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Transcontinental Gas Pipe Line  
Company, LLC

Docket No. CP16-494-000

# **Gulf Connector Expansion Project**

Environmental Assessment

Washington, DC 20426



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## ABBREVIATIONS AND ACRONYMS

AMSL	above mean sea level
BCC	Birds of Conservation Concern
BCR	bird conservation regions
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practices
CAA	Clean Air Act of 1970
Certificate	Certificate of Public Convenience and Necessity
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalents
Commission	Federal Energy Regulatory Commission
dB	decibel
dBA	A-weighted decibel
EA	environmental assessment
EIs	environmental inspectors
ESA	Endangered Species Act
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gas
GWP	global warming potential
HAP	hazardous air pollutants
HDD	horizontal directional drilling
hp	horsepower
HUC	Hydrologic Unit Code
kW	kilowatt
L <sub>dn</sub>	day-night sound level
L <sub>eq</sub>	equivalent sound level
M&R	metering and regulating
MP	milepost
Memorandum	Memorandum of Understanding on Natural Gas Transportation Facilities
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
N <sub>2</sub> O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NGA	Natural Gas Act

NNSR	Nonattainment New Source Review
NO <sub>2</sub>	nitrogen dioxide
NOI	<i>Notice of Intent to Prepare an Environmental Assessment for the Proposed Gulf Connector Expansion Project and Request for Comments on Environmental Issues</i>
NO <sub>x</sub>	Oxides of Nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSA	Noise Sensitive Area
NSR	New Source Review
NWR	National Wildlife Refuges
O <sub>2</sub>	Oxygen
OEP	Office of Energy Projects
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
PM	particulate matter
PM <sub>2.5</sub>	particulate matter with an aerodynamic diameter less than or equal to 2.5 microns
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to 10 microns
ppm	parts per million
PEM	Palustrine Emergent Marshes
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
PTE	potential-to-emit
PSD	Prevention of Significant Deterioration
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO <sub>2</sub>	sulfur dioxide
SPCC Plan	Spill Prevention Containment and Countermeasure Plan
T&E	Threatened and Endangered species
TCEQ	Texas Commissions on Environmental Quality
TPWD	Texas Parks and Wildlife Department
Transco	Transcontinental Gas Pipe Line Company, LLC
tpy	tons per year
TWS	Temporary Work Space
USACE	United States Army Corps of Engineers
BIA	United States Department of Interior, Bureau of Indian Affairs
USDOT	United States Department of Transportation
EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compounds

## **SECTION A – PROPOSED ACTION**

### **A.1 INTRODUCTION**

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this environmental assessment (EA) to assess the environmental effects of constructing and operating the natural gas facilities proposed by the Transcontinental Gas Pipe Line Company, LLC (Transco). We<sup>1</sup> prepared this EA in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA), Title 40 of the Code of Federal Regulations, Parts 1500-1508 [40 CFR 1500-1508]), and with the Commission’s implementing regulations under 18 CFR 380.

On August 16, 2016, Transco filed an application with the Commission in Docket No. CP16-494-000 for the Gulf Connector Expansion Project (Project) under section 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations. Transco seeks to construct and operate interstate natural gas transmission facilities in Texas.

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

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

### **A.2 PURPOSE AND NEED**

Transco states that the purpose of the Project is to provide an additional 475,000 dekatherms per day (dt/d) of natural gas and firm transportation service to Transco’s mainline. This service is needed to meet its contractual obligations with Corpus Christi Liquefaction, LLC and Osaka Gas Trading and Export, LLC.

Under Section 7 of the NGA, the Commission determines whether interstate natural gas transportation facilities are in the public convenience and necessity and, if so, grants a Certificate to construct and operate them. The Commission bases its decisions on technical competence, financing, rates, market demand, gas supply, environmental impact, long-term feasibility, and other issues concerning a proposed project.<sup>2</sup>

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<sup>1</sup> “We,” “us,” and “our” refers to environmental staff of the Office of Energy Projects

<sup>2</sup> Commission Policy Statement PL99-3

## **A.3 PROPOSED FACILITIES**

The Project would involve the installation of new facilities and modification of existing facilities as described below. All project construction would take place in the State of Texas.

### **A.3.1 Compression Facilities**

A proposed Compressor Station 17 (CS 17) in San Patricio County would consist of:

- one Solar Taurus 60 turbine unit with a C40 compressor for a total of 7,800 horsepower (hp);
- two pipeline pig traps and mainline block valve;
- one 24-inch station suction header and discharge header;
- one separator sized to handle 400,000 dt/d;
- one blowdown silencer;
- one below ground oily water sump tank with pump;
- one above ground 8,820-gallon storage tank for condensate;
- one auxiliary building that would include warehouse, storage, office, and a break room area;
- one communication building and 190-foot-tall self-supporting communication tower (the communication building would house the controls for the microwave communication and local phone line);
- an emergency generator in a weather-proof enclosure for operation of the entire station; and
- a storm water detention area.

A proposed Compressor Station 23 (CS 23) in Victoria County would consist of:

- two Solar Taurus 70 turbine unit with C40 compressor for a total of 21,600 hp;
- one 24-inch station suction header and discharge header;
- unitized suction scrubbers (one per unit) sized to handle 200,000 dt/d each;
- four blowdown silencers for the suction and discharge headers and the unit piping;
- one 190-foot-tall self-supporting communication tower.
- one below ground oily water sump tank with pump;
- one above ground 4,200-gallon storage tank for oily water; and
- one above ground 8,820-gallon storage tank for condensate.

A proposed Compressor Station 32 (CS 32) in Wharton County would consist of:

- one electric motor drive unit with JGH/4 Frame Ariel Compressor for a total of 1,500 hp;
- one 12-inch station suction header and discharge header;
- three blowdown silencers;
- one below ground oily water sump tank with pump;

- one above 4,200-gallon storage tank for oily water;
- one above ground 8,820-gallon storage tank for condensate;
- one above ground 500-gallon storage tank for compressor oil;
- one auxiliary building that would include warehouse, storage, office, and a break room area;
- one communication building and 190-foot-tall self-supporting communication tower. The communication building would house the controls for the microwave communication and local phone lines;
- an emergency power generator in a weather-proof enclosure; and
- a storm water detention area.

Modification to an existing Compressor Station 30 (CS 30) in Wharton County would consist of new piping, as well as intermediate connecting lines to be used to block and/or redirect gas flow; and replacement of one existing 300-foot-tall communication tower with a new 300-foot-tall self-supporting communication tower at same location.

Modifications to an existing Compressor Station 40 (CS 40) in Hardin County would consist of new piping, headers, as well as intermediate connecting lines to be used to block and/or redirect gas flow. Modifications to an existing Compressor Station 35 (CS 35) in Harris County would consist of piping and valve modifications at existing station boundaries for bidirectional flow.

### **A.3.2 Other Facilities**

A new interconnect (Corpus Christi Interconnect) in San Patricio County would consist of a new meter station; a flow control filter; a filter separator; a condensate tank; a remote terminal unit (RTU) and chromatograph building with associated chromatograph; and electronic flow measurements and radio communications equipment.

Finally, Transco would also construct a new 190-foot-tall self-supporting communication tower in Jackson County at proposed Site 27.

### **A.3.3 Access Roads and Staging/Contractor Yards**

Transco proposes to use its currently decommission Compressor Station 20 (CS 20) in Refugio County as a construction storage yard.

Transco would use existing public roadways and proposed temporary and permanent access roads to access construction work areas and permanent facilities. Transco would construct a new permanent access road at the proposed CS 23 and 32 facility. Transco would obtain all necessary property rights and approvals from landowners and government agencies prior to the use or modification of any Project access roads.

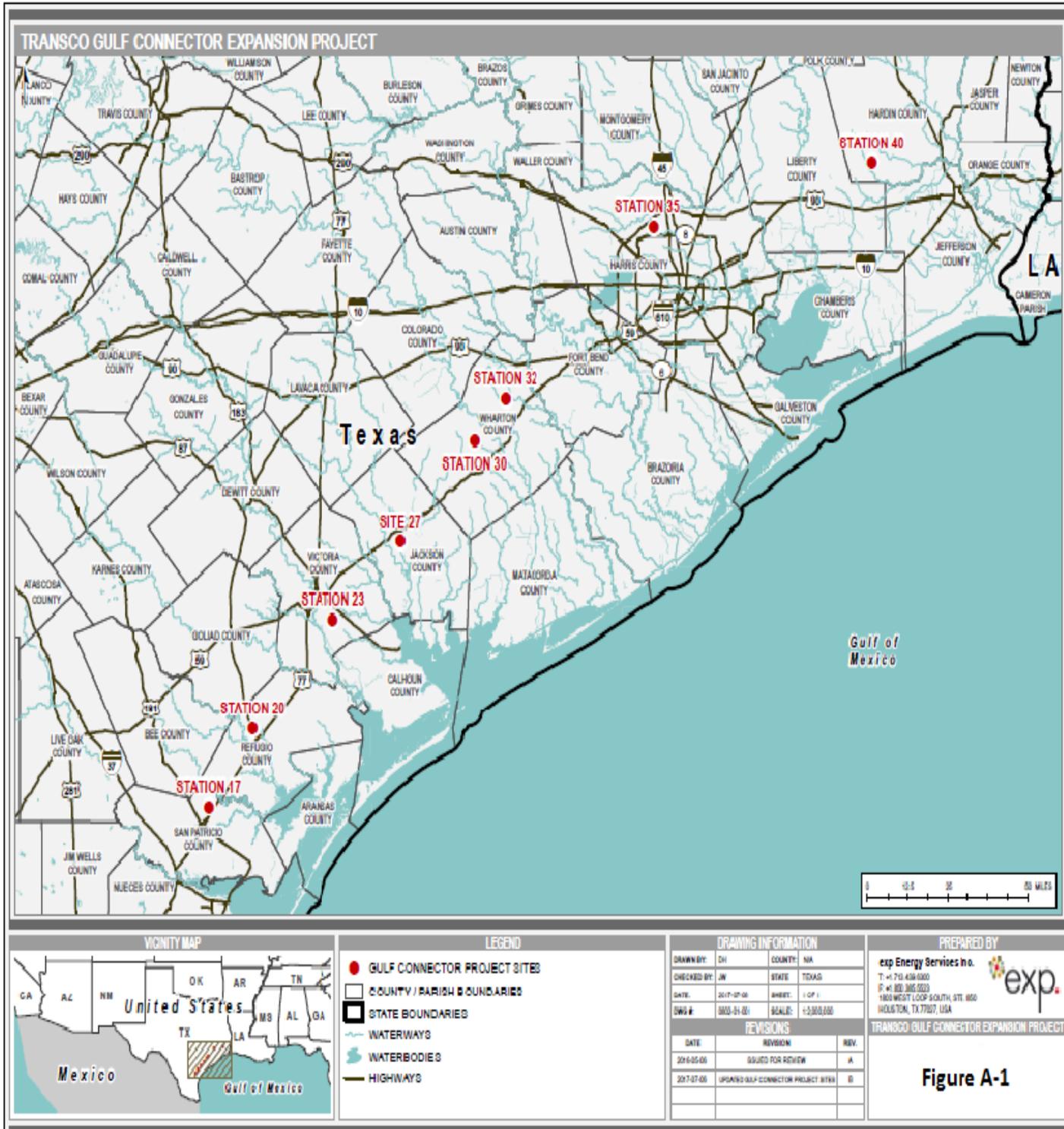


Figure A-1 – Location Map

## **A.4 NON-JURISDICTIONAL FACILITIES**

Under Section 7 of the Natural Gas Act, the Commission is required to consider, as part of its decision to approve facilities under Commission jurisdiction, all factors bearing on the public convenience and necessity. Occasionally, proposed projects have associated facilities that do not come under the jurisdiction of the Commission. These “non-jurisdictional” facilities may be integral to the need for the proposed facilities, such as a power plant at the end of a jurisdictional pipeline, or they may be minor, non-integral components of the facilities under the Commission’s jurisdiction. There are no non-jurisdictional facilities associated with this Project.

## **A.5 PUBLIC REVIEW AND COMMENT**

On September 22, 2016, the Commission issued a *Notice of Intent to Prepare an Environmental Assessment for the Proposed Gulf Connector Expansion Project and Request for Comments on Environmental Issues* (NOI). The NOI was mailed to federal, state, and local government representatives and agencies; elected officials; Native American tribes; newspapers and libraries in the project area; and landowners within 0.5 mile of the proposed facilities.

In response to the NOI, we received a letter from the U.S. Department of Interior, Bureau of Indian Affairs (BIA), and the Southern Plains Region stating that there are no tribal or individual Indian trust lands in the vicinity of the proposed Project area. We also received several recommendation from the Texas Parks and Wildlife Department (TPWD). TPWD’s recommendations include general impacts and avoidance measures for wildlife and are discussed in section B.3 Vegetation and Wildlife.

## **A.6 CONSTRUCTION, OPERATION, AND COMPLIANCE**

Transco would construct, operate, and maintain the proposed Project in compliance with all applicable federal and state permit requirements, regulations, and environmental guidelines. Specifically, Transco would construct the Project in compliance with 49 CFR 192 – Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards which is administered by the United States Department of Transportation (USDOT) and was developed to ensure adequate protection for the public and prevent natural gas facility accidents and failures.

Transco has indicated that it would construct the Project consistent with FERC’s *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures).<sup>3</sup> However, Transco

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<sup>3</sup> The Plan and Procedures include best management practices for pipeline facility construction to minimize resource impacts. Copies of the Plan and Procedures may be accessed on our website (<http://www.ferc.gov/industries/gas/enviro/guidelines.asp>).

proposes to use its own project-specific Plan (Transco's Plan) and Procedures (Transco's Procedures), which include some exceptions to FERC's Procedures. The requested deviations are shown in table A-1 below and are addressed in section B.4:

**Table A-1**

**Deviation to FERC's Wetland & Waterbody Construction & Mitigation Procedures**

<b>Requirement</b>	<b>Location of Deviation</b>	<b>Feature</b>	<b>Justification</b>
<p>Section VI.B.</p> <p>1. Extra Work Areas and Access Roads</p> <p>a. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries, except where the adjacent upland consists of cultivated or rotated cropland or other disturbed land.</p>	<p align="center">Compressor Station 40 (Existing)</p>	<p align="center">W-011 - PEM wetland and W-012 - PEM wetland</p>	<p>There are limited upland areas within the existing Compressor Station 40 property. Therefore, temporary workspace is proposed to be located within a PEM wetland.</p>
<p>Section V.B.</p> <p>2. Extra Work Areas</p> <p>a. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge, except where the adjacent upland consist of cultivated or rotated cropland or other disturbed land.</p>	<p align="center">Proposed Compressor Station 23 (New)</p>	<p align="center">W-005 - Ephemeral agricultural ditch</p>	<p>There are insufficient upland areas within the compressor station boundary to provide the 50-foot buffer from the water's edge from this drainage ditch. The facility site is surrounded by agricultural fields.</p>
	<p align="center">Proposed Compressor Station 32 (New)</p>	<p align="center">W-013 - Ephemeral roadside ditch</p>	<p>There are insufficient upland areas within the compressor station boundaries to provide the 50-foot buffer from the water's edge from drainage ditch. The facility site is surrounded by agricultural fields.</p>

Table A-1

Deviation to FERC's Wetland & Waterbody Construction & Mitigation Procedures

<p>Section V.B.</p> <p>2. Extra Work Areas</p> <p>a. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge, except where the adjacent upland consist of cultivated or rotated cropland or other disturbed land.</p>	<p>Compressor Station 30 (Existing)</p>	<p>Jones Creek borders the northern portion of the site</p>	<p>There are insufficient upland areas within the compressor station boundaries to provide the 50 foot buffer from the water's edge. The facility site is surrounded by agricultural fields. In addition, the potential locations for extra workspace are constrained by the need to collocate and integrate with the existing infrastructure.</p>
	<p>Compressor Station 40 (Existing)</p>	<p>W-006-Ephemeral drainage ditch, W-007 - Ephemeral drainage ditch W-009 (Detention pond), and W-010 (Railroad Commission of Texas grey-water pit)</p>	<p>There are insufficient upland areas within the existing compressor station boundaries to provide the 50-foot buffer from the water's edge from these drainage features. The facility site is surrounded by agricultural fields (rice farms) to the north and east and pine/hardwood forest (silviculture) to the south and west. In addition, the potential locations for extra workspace are constrained by the need to collocate and integrate with the existing infrastructure.</p>
	<p>Construction Storage Yard (Decommissioned Compressor Station 20)</p>	<p>W-001 - Ephemeral roadside ditch/swale, W-002 - Ephemeral agricultural ditch/swale, W-003 - Ephemeral agricultural ditch/swale, W-004 - Detention pond</p>	<p>There are insufficient upland areas within the decommissioned compressor station boundaries to provide the 50-foot buffer from the water's edge from these drainage features.</p>

Additionally, Transco would implement its *Unanticipated Discovery of Contamination Plan*, as well as, Transco's site-specific *Spill Prevention and Response Procedure* (SPRP) and adhere to all applicable federal, state, and local regulations. Transco has provided sufficient justification for the proposed deviations to FERC's Procedures.

Transco would use a full-time environmental inspector (EI) that would be trained in, and responsible to ensure that construction of the Project complies with the construction procedures and mitigation measures identified in the Transco's applications, the FERC Certificate, other environmental permits and approvals, and environmental requirements in landowner easement agreements. The EI would have peer status with all other activity inspectors, and have the authority to stop activities that violate the environmental conditions of the FERC Certificate, other permits, or landowner requirements, and to order the appropriate corrective action. The EIs would also be responsible for maintaining status reports and training records. In addition, the EIs would be responsible for advising the chief construction inspector when conditions (such as wet weather) make it advisable to restrict construction activities.

Transco would conduct training sessions in advance of construction to ensure that all contractor and Transco personnel working on the Project are familiar with the environmental mitigation measures appropriate to their jobs.

Transco has no definitive future plans for expansion or abandonment of the Project facilities. Future expansion or abandonment activities would require new, separate applications to the FERC.

Phase one of the Project is expected to last for approximately 12 months. Transco is expected to place phase 1 of the Project in-service by September 1, 2018 and January 1, 2019 for phase 2.

## **A.7 ABOVEGROUND FACILITY CONSTRUCTION PROCEDURES**

During construction, Transco would clear and grade the sites for the aboveground facilities. Erosion control devices would be installed as needed to prevent erosion and offsite impacts in accordance with Transco's Plan and applicable state permit requirements. Access to the aboveground facilities would be provided by new and existing access roads. After construction, all temporary workspaces would be revegetated in accordance with Transco's Plan.

## A.8 LAND REQUIREMENTS

Constructing the Project would temporarily affect 228 acres; of this, 52 acres would be permanently affected by operation. Table A-2 identifies the land requirements for each of the proposed facilities including access roads. Land not permanently affected would be allowed to revert to previous use.

<b>Table A-2</b>			
<b>Land Required to Construct and Operate the Project</b>			
<b>Facility</b>	<b>County, State</b>	<b>Land Required for Construction (acres)</b>	<b>Land Required for Operation (acres)</b>
Compressor Station 17	San Patricio, TX	50.1	24.9
Corpus Christi Interconnect	San Patricio, TX	4.6	1.4
Compressor Station 23	Victoria, TX	55.7	15.0
Compressor Station 30	Wharton, TX	18.4	<0.1
Compressor Station 32	Wharton, TX	30.7	6.2
Compressor Station 35	Harris, TX	16.9	0.8
Compressor Station 40	Hardin, TX	18.5	0.1
Construction Storage Yard (Decommissioned Compressor Station 20)	Refugio, TX	18.9	1.0
Communication Tower Site 27	Jackson, TX	1.3	0.1
Compressor Station 17 Access Road (AR-17)	San Patricio, TX	9.1	0
Storage Yard 20 Access Road (AR-20)	Refugio, TX	0.9	0.9
Compressor Station 23 Access Road (AR-23)	Victoria, TX	2.2	0.8
Compressor Station 32 Access Roads (AR-32/AR32-01)	Wharton, TX	0.4	0.4
Communication Tower Site 27 Access Road (AR-27)	Jackson, TX	0.1	0.1
<b>Project Totals</b>		<b>228</b>	<b>52</b>
<b>Note: Land not permanently affected by operations would revert or continue as previously used.</b>			

## A.9 PERMITS, APPROVALS, AND REGULATORY CONSULTATIONS

Transco would obtain all necessary permits, licenses, clearances, and approvals related to construction and operation of the Project. Table A-3 below summarizes the major federal, state and county permits for the Project.

<b>Table A-3 Permits and Approvals for Construction of the Project</b>		
<b>Administering Agency</b>	<b>Permit/Approval</b>	<b>Status</b>
<b>Federal</b>		
U.S. Army Corps of Engineers - Galveston District	Clean Water Act, Section 404 Permit (Nationwide Permit 12)	Pre-Construction Notification not required
U.S. Environmental Protection Agency	Section 402 of the Clean Water Act, Notional Pollution Discharge Elimination System (NPDES) Stormwater Construction Permit	Notification prior to construction
U.S. Fish and Wildlife Service (FWS), Texas Coastal Ecological Service Field Office	Endangered Species Act, Section 7 consultation (federally listed species). Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act Consultation	Informal Consultation initiated on July 19, 2016. USFWS concurrence letter was received on September 22, 2016. Project modification consultation letter submitted on April 28, 2017.
<b>Native American Tribes</b>		
United States Department of the Interior, Bureau of Indian Affairs, Southern Plains Region	Section 106 of the National Historic Preservation Act Consultation	Responded to FERC with no concerns that the proposed Project would impact Indian trust lands within the Southern Plains Region's jurisdiction or raise any environmental issues - October 3, 2016
Comanche Nation Historic Preservation Office	Section 106 of the National Historic Preservation Act Consultation	Categorical Exclusion request - May 4, 2016. Tribe responded with no concerns - June 15, 2016. Phase I cultural resources report submitted - July 12, 2016. Response received on July 28, 2016. Project modification consultation letter submitted on April 13, 2017.
Tonkawa Tribe of Oklahoma	Section 106 of the National Historic Preservation Act Consultation	Categorical Exclusion request - May 4, 2016. Tribe responded with no concerns - July 12, 2016. Phase I cultural resources report submitted - July 12, 2016. Project modification consultation letter submitted on April 13, 2017.

<b>Table A-3 Permits and Approvals for Construction of the Project</b>		
<b>Administering Agency</b>	<b>Permit/Approval</b>	<b>Status</b>
<b>State</b>		
Railroad Commission Texas	Hydrostatic Test Water Discharge Approval	Application to be submitted prior to hydrostatic testing
	Clean Water Act, Section 401 Water Quality Certification (automatic with NWP 12)	Submittal not required
Texas Commission on Environmental Quality	State minor source Permits-By- Rule applications (Compressor Stations 17, 23, and 32)	Application submitted - September 23, 2016. Permits-By-Rule registration approved October 27, 21, and 24, 2016 (Compressor Stations 17,21,and 32, respectively)
Texas Parks and Wildlife Department (TPWD)	Threatened and Endangered Species Clearance	Consultations initiated in July 2016. TPWD's response letter was received on August 31, 2016 and on October 10, 2016. Project modification consultation letter submitted on April 28, 2017.
Texas State Historic Preservation Office	Section 106 of the National Historic Preservation Act Consultation	Categorical Exclusion request - May 6, 2016. Agency approved request - May 17, 2016. Phase I cultural resources report submitted - July 12, 2016. Agency concurrence with no concerns - July 29, 2016. Project modification Phase I cultural resource report submitted on April 28, 2017.
<b>County</b>		
Building Permit as needed	San Patricio, Victoria, and Wharton County	Applications to be submitted prior to construction.

## **SECTION B – ENVIRONMENTAL ANALYSIS**

Construction and operation of the Project would have temporary, short-term, long-term, and permanent impacts. As discussed throughout this EA, temporary impacts are defined as occurring only during the construction phase. Short-term impacts are defined as lasting between two and five years. Long-term impacts are defined as lasting five years or more. Permanent impacts are defined as lasting throughout the life of the Project. We use the term “Project area” to characterize the geographic scope of impacts caused by construction and operation of the proposed facilities. Direct and indirect impacts that may occur in combination with other projects in the area are discussed in the cumulative impact section of the EA, section B.9.

### **B.1 GEOLOGY**

#### **Geologic Setting**

The Project is located in the Coastal Prairie region of the Gulf Coastal Plains physiographic province of Texas. The Coastal Prairie sub-province begins at the edge of the Gulf of Mexico and extends to the northwest for approximately 50 to 75 miles. The sediments are composed of young (Pleistocene and Holocene) unconsolidated deltaic sands, silts, and clays incised by meandering streams that discharge into the Gulf of Mexico.

The Coastal Prairie region is characterized by seaward-dipping sedimentary rocks overlain by Quaternary deposits containing thick layers of clay, silt, sand, and gravel. In the Texas Gulf Coast, recent Holocene deposits generally consist of alluvial, deltaic, beach, bay-estuary, and marsh deposits, and are underlain by Pleistocene deltaic and alluvial deposits to a few thousand feet below ground level. The topography of the region is nearly flat with subsurface sediments that dip gently toward the Gulf of Mexico and are dissected by highly sinuous streams. The minimum elevation in the Project area is approximately 55 feet above mean sea level (msl) at Compressor Station 40 in Hardin County, and the maximum elevation is approximately 120 feet above msl at Compressor Station 30 in Wharton County, Texas. The Project is not located within any documented sites containing karst terrain or soil subsidence.

## **Mineral Resources**

A variety of exploitable mineral resources occur in the vicinity of the Project facilities. These resources include aluminum, salt, industrial sand, gravel, oil, and gas. Based on a review of the 2011 USGS Mineral Resources Data System and information obtained from the Railroad Commission of Texas (RRC), no mineral resources are located within 0.25 mile of the proposed Project. Due to the lack of these resources within proximity to the Project facilities, no associated impacts to mineral resources are anticipated.

## **Seismic Hazards**

Seismic hazards include earthquakes, surface faulting, and soil liquefaction. The proposed Project is located in a region of the U.S. where seismic activity is low. No significant earthquakes have been recorded within the Project area since record keeping began in. A significant earthquake is defined by the USGS as an earthquake that causes death, property damage, or geological effects, or that was experienced by populations near the epicenter.

U.S. National Seismic Hazard Maps estimate that an earthquake with both a 10 percent probability and a 2 percent probability of occurring within any 50-year interval would result in peak ground accelerations of up to 2 percent gravity in the region encompassing the Project area. No impacts to the proposed Project facilities are anticipated because damage to buildings and other structures is unlikely to occur at ground accelerations less than 10 percent gravity. Additionally, a review of the USGS Quaternary Faults and Fold Database did not identify active faults in the vicinity of the Project facilities. Large permanent ground movements are unlikely to occur in the vicinity of the proposed Project due to the absence of known faults and low probability of damaging earthquakes in the Project area.

Soil liquefaction is a condition whereby soil loses strength and stiffness, causing it to flow like liquid. This condition typically occurs when loose, saturated soil is subjected to intense vibration or shockwaves, most commonly from a nearby major earthquake. The low probability of a major earthquake within the Project area makes the occurrence of soil liquefaction unlikely. Seismic risk is not anticipated to be a hazard associated with construction or operation of the proposed Project facilities.

## **Landslides**

Landslides occur when unconsolidated soils and sediments located on steep slopes become saturated, usually from a flooding event. The region encompassing the Project area is generally flat and is characterized by low probability and low incidence of

landslides, with less than 1.5 percent of the land area likely to be involved in landslides. It is not anticipated that landslides would affect Project facilities.

### **Flash Flooding**

Flash flooding events have the potential to upset active construction or damage project facilities that would be in close proximity to streams or rivers. The proposed Project facility sites are not at a high risk for flooding. Federal Emergency Management Agency (FEMA) 100-year floodplain data indicate that the Project facilities in Refugio and Hardin counties are not located in the 100-year floodplain which is subject to inundation by the 1 percent chance of an annual flood event. Although FEMA 100-year floodplain data are not available in San Patricio, Victoria, and Wharton, review of FEMA flood insurance rate maps show that Project facilities in these counties are outside of flood prone areas. It is not anticipated that flash flooding would affect the proposed Project.

### **Blasting**

The Project area consists of a thick sequence of unconsolidated deposits and based on analysis of county soils data according to the Soil Survey Geographic Database (SSURGO) database for shallow depth to bedrock soils, blasting is not anticipated to be necessary for construction of the Project facilities.

### **Paleontological Resources**

Paleontological resources include impressions in rock and/or fossilized remains of prehistoric organisms. Although paleontological resources are relatively common in the Project area, there are no known unique or important formational features or fossil collecting locations within the Project area. According to data obtained from the SSURGO data base, there are no bedrock outcrops at or near the ground surface in the Project area that would indicate possible sensitive fossiliferous material exists. Prior disturbances and a lack of shallow bedrock or rocky soils make it unlikely that the Project would adversely affect significant paleontological resources. In the unlikely event that paleontological resources are discovered during construction at any of the proposed Project facilities, Transco will notify the relevant local and state agencies in accordance with its Unanticipated Paleontological Resources Discovery Plan.

## **B.2 SOILS**

Soil series are soils that are grouped together due to their similar soil chemistry and physical properties. Each soil series is delineated as a single map unit and represent the dominant soil patterns or characteristics. A description of the soil series crossed by the Project was compiled from information presented in the United States Department of

Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database. Table B-1 lists the characteristics of each detail soil unit within the Project area, as well as the milepost, the total feet of each soil unit crossed by the pipeline lateral, and acreage affected by the aboveground facilities. Descriptions regarding the general characteristics of each soils series within the Project area are also presented in table B-1.

## **Existing Soil Characteristics and Mitigation**

### **Prime Farmland**

The USDA defines prime farmland as land that is best suited to food, feed, fiber, and oilseed crops. This designation includes cultivated land, pasture, woodland, or other lands that are either used for food or fiber crops or are available for these uses. Urbanized land and open water are excluded from prime farmland. Prime farmland typically contains few to no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent, prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated.

Locations and acreages of prime farmland along the Project were determined by a query of the SSURGO database. Prime farmland soils were identified at Compressor Stations 17, 23, 30, and 32. To minimize or avoid impacts on soils during construction, Transco will utilize the methods outlined in Transco's Plan, such as testing for compaction and topsoil segregation.

**TABLE B-1  
Soil Associations and Major Soil Limitations Present in the Project Area**

Facility	Soil	Soils Disturbed (Acres)		Prime Farmland	Compaction Prone	Highly Erodible Land (water)	Shallow Bedrock	Flooding Potential
		Construction	Operation					
Compressor Station 17 (New)	Callen Sandy Clay (Os)	50.1	24.9	No	No	No	No	Moderate
Corpus Christi Interconnect (New)	Callen Sandy Clay (Os)	4.6	1.4	No	No	No	No	Moderate
Compressor	Banquette Clay (Ec)	0.6	0	No	No	No	Yes	Moderate
Station 17 Access Road (AR-17)	Orelia fine sandy loam (Or)	0.3	0	No	No	No	Yes	Moderate
	Callen Sandy Clay (Os)	6.8	0	No	No	No	No	Moderate
	Papalote fine sandy loam (PaA)	1.4	0	Yes	No	No	Yes	Good
Construction Storage Yard (Decommissioned Compressor Station 20)	Wyick fine sandy loam (Wy)	18.8	0	Yes	No	No	Yes	Moderate
Construction Storage Yard 20 Access Road (AR20)	Banquette Clay (Ec)	0.5	0	No	No	No	Yes	Moderate
	Wyick fine sandy loam (Wy)	0.3	0	Yes	No	No	Yes	Moderate
Compressor Station 23 (New)	Laewest clay (LaA)	55.7	15	Yes	No	No	No	Good
Compressor Station 23 Access Road (AR-23)	Laewest clay (LaA)	2.2	0.8	Yes	No	No	No	Good

**TABLE B-1  
Soil Associations and Major Soil Limitations Present in the Project Area**

Facility	Soil	Soils Disturbed (Acres)		Prime Farmland	Compaction Prone	Highly Erodible Land (water)	Shallow Bedrock	Flooding Potential
		Construction	Operation					
Compressor Station 30 (Existing)	Bernard-Edna complex (BeA)	18.4	<0.1	Yes	No	No	Yes	Good
Compressor Station 32 (New)	Bernard clay loam 0 to 1 percent slopes (BcA)	<0.1	0	Yes	No	No	Yes	Good
	Lake Charles clay (LcA)	17.9	3.1	Yes	No	No	No	Good
Compressor Station 32 Access Road (AR-32/AR32-01)	Bernard clay loam 0 to 1 percent slopes (BcA)	0.2	0	Yes	No	No	Yes	Good
	Lake Charles clay (LcA)	0.8	0.4	Yes	No	No	No	Good
Compressor Station 40 (Existing)	Aris-Levac complex, 0 to 1 percent slopes (ArsA)	18.4	0.1	No	Yes	No	Yes	Low

If construction activities, particularly the operation of heavy equipment, occur when soils are saturated, soil compaction and rutting could result. To avoid rutting and compaction, Transco will avoid construction during periods of heavy rainfall and implement measures such as restricting vehicular traffic, reducing loads, using lower ground-pressure equipment, and employing equipment ground support such as timber matting may be used. If soil compaction is apparent in areas that will not be permanently impacted, Transco will minimize compaction with deep tillage and grading to restore natural site contours to repair compacted areas, in order to allow for successful revegetation upon completion of the proposed Project.

## **Soil Erosion**

Erosion is a continuing process that can be accelerated by human disturbances. Factors that can influence the degree of erosion include soil texture, structure, length and percent slope, vegetative cover, as well as rainfall or wind intensity. Soils most susceptible to erosion by water are typified by bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Wind erosion processes are less affected by slope angles. Highly erodible land, as designated by the NRCS, includes both water and wind as agents of erosion.

Soils with high erosion potential within the Project area were identified based on NRCS designations of land capability class and subclass. The majority of the land in the Project area has low erosion potential. Table B.1 identifies the erosion potential of each map unit within the Project area. No soils within the above ground facility Project area were found to be susceptible to severe wind erosion.

Soil associated with the Project area which may be susceptible to severe water erosion was identified at the existing Compressor Station 40 site. To minimize or avoid potential impacts due to soil erosion and sedimentation, Transco would utilize erosion and sedimentation control devices as described in its Plan. Temporary erosion controls, including interceptor diversions and sediment filter devices (including, but not limited to hay bales and silt fences) would be installed immediately following any clearing activities. Some areas may require that the controls be installed prior to clearing activities. These areas will be evaluated accordingly prior to construction. Temporary erosion control devices will be inspected on a regular basis, as well as after each rainfall event of 0.5 inch or greater to ensure that the controls are functioning properly.

Temporary and permanent erosion control measures would be used to keep surface water runoff from eroding the Project site and to minimize the velocity and quantity of water moving over the surface. Excavation dewatering may also be performed. Appropriate filtering mechanisms will be employed where this activity occurs. Excavation water will be discharged to a sediment filter bag and/or a hay bale enclosure in a well vegetated upland area.

## **Rocky Soils and Shallow Bedrock Soils**

Soils with cobbles, rocks, and boulders present can affect revegetation post construction. Introducing stones, cobbles, or rocks to surface soil layers can reduce soil moisture-holding capacity and thus reduce soil productivity. The potential for introducing rock into the topsoil was evaluated based on bedrock depth. SSURGO data was used to identify soil map units where depth to bedrock is generally anticipated to be less than 5 feet (60 inches) from the soil surface. Transco would minimize impacts due to the potential presence of rock by managing the rock in accordance with Transco's Plan and Procedures.

## **Inadvertent Spills or Discovery of Contaminants**

Soil contamination in the Project area may result from at least two sources: hazardous material or fuel spills during construction; and/or those occurring prior to construction in pre-existing contaminated areas that are encountered during construction. Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of such contamination are typically minor because of the low frequency and volumes of spills and leaks. Transco would implement its SPRP during construction to ensure that potential soil contamination impacts are minimized.

A review of the U.S. Environmental Protection Agency (EPA) and Texas Commission of Environmental Quality (TCEQ) online databases was conducted to identify recent or historic sources of contamination within 0.25 mile of the Project facilities. The Project facilities do not contain and are not located within 0.25 mile of any known contaminated sites. No landfills will be affected or are within 0.25 mile of the Project.

Transco does not anticipate any potential concerns relating to hazardous materials during construction or operation of the Project facilities. Should any hazardous materials be encountered during construction, Transco would implement its *Unanticipated Discovery of Contamination Plan* and would dispose of and/or mitigate for the hazardous materials in accordance with such plan applicable regulations.

## **B.3 WATER RESOURCES**

### **Groundwater**

The Project area is located in the coastal lowlands aquifer system in southeastern Texas, which extends along the Gulf Coast of the U.S. and is characterized as an unconfined aquifer with unconsolidated sand and clay deposits. The coastal lowlands aquifer system yields large amounts of water for public, agricultural, and industrial uses. Groundwater occurs at maximum depths ranging from 200 feet below mean sea level (msl) to 2,000 feet below msl. There are no designated groundwater or source water protection areas or EPA designated sole source aquifers in the Project area.

### **Public and Private Water Supply Wells**

Two private wells (owned by Transco) are located within 150 feet of the Construction Storage Yard (decommissioned Compressor Station 20). We do not anticipate any impacts on these wells if Transco follows the measures in its Plan during Project construction and maintenance to minimize potential impacts. There are no other wells (public or private) or springs located within 150 feet of the Project area.

### **Groundwater Contamination**

The Project facilities do not contain and are not located within 0.25-mile of any known contaminated sites that could potentially introduce contamination during construction. Should hazardous materials be encountered during construction, Transco would implement its *Unanticipated Discovery of Contamination Plan* (contained within the SPRP) and will dispose of and/or mitigate for the hazardous materials in accordance with applicable regulations.

There could be minor indirect impacts on shallow groundwater from changes in overland water flow and surface soil infiltration caused by vegetation clearing, grading, an increase in impervious surfaces, and soil compaction from the operation of heavy equipment. Transco would install stormwater management facilities in accordance with state permit requirements and its Plan and Procedures. Any impacts to infiltration or groundwater recharge due to surface changes, vegetation clearing, or soil compaction would be minor because Transco would restore and revegetate the ground surface in temporary workspace areas. Additionally, any impervious areas created by the Project would be relatively small in comparison to the surrounding area available for aquifer recharge.

Spills or leaks of hazardous liquids resulting from the refueling of construction vehicles and storage of fuel, oil, and other fluids during construction could potentially contaminate shallow groundwater or aquifers. Transco would follow its SPRP during all

phases of Project construction. The SPRP identifies the types and quantity of materials handled, stored, or used during construction; measures to be taken for spill prevention and control; emergency response procedures; and spill reporting and notification procedures. Due to the shallow excavation necessary to construct Project facilities and Transco's implementation of its Plan and its SPRP, we conclude that the Project would not have significant impacts on groundwater resources.

## **Surface Water Resources**

### **Waterbodies**

No perennial waterbodies are located within the proposed construction or operational footprint of the Project. The Project is not located near any scenic waterbodies or waterbodies listed in the Nationwide Rivers Inventory or National Wild and Scenic Rivers System. Furthermore, no sensitive surface waters occur within the Project vicinity, nor are there any crossings of surface waterbodies containing known contaminated sediments.

Transco conducted field delineations for wetlands and waterbodies in the Project area. Several drainage ditches, two detention ponds, and one grey-water pit were identified during the field surveys. The Project would cross three waterbody features as shown in table B-2. A description of waterbodies in the Project area is provided below.

### **Compressor Stations 23 and 32**

Transco identified one ephemeral agricultural drainage ditch (W-005) along the southern and eastern boundary of the Compressor Station 23 site. Transco noted that the ditch contained standing water (approximately 1-2 inches deep) throughout portions of the waterbody at the time of survey. This ditch would be avoided by construction.

At Compressor Station 32, Transco would install a culvert for an access road that passes over an ephemeral roadside ditch (W-013) along County Road 211 on the west side of the Compressor Station 32 site. Transco's surveyors noted that the roadside ditch was completely covered in vegetation (grass) and lacked standing water. The culvert would be permanent, but would be designed to minimize impacts on the ditch and provide safe access to the site.

### **Compressor Station 40**

The existing Compressor Station 40 site is surrounded by a levee/berm with two ephemeral drainage ditch systems (W-006 and W-007) that transfer rainwater to one of two water pumps. The pumps transfer the water out of the site into an adjacent roadside ditch. Additionally, one detention pond (W-009) is located in the southeast corner of the

site. The detention pond holds pumped water from the southern drainage system (W-007) before it is discharged into an adjacent roadside ditch through a pipe. A permitted RRC grey-water pit (W-010 - RRC Pit Permit #010930) is located on the western portion of the site. Transco would avoid the detention pond and the RRC grey-water pit during construction.

Transco would need to cross sections of the two drainage ditches (W-006 and W-007) during construction to access the temporary workspace areas and would use timber mats or other measures to minimize construction-related impacts. Transco would cross drainage ditch W-007 using an open-cut crossing method to connect the station piping to Transco's mainline pipeline system. Transco would not install permanent aboveground structures that could impede or redirect potential flows from any of the constructed drainages. Transco does not anticipate that Project activities would have permanent impacts on the site drainage ditch systems.

### **Construction Storage Yard (Decommissioned Compressor Station 20)**

One isolated, manmade, dry pond (W-004) is located in the southeast corner of the proposed construction storage yard (decommissioned Compressor Station 20). Three ephemeral drainage ditches/swales (2 agricultural ditches [W-002 and W-003] and 1 roadside ditch [W-001]) are located on the southern portion of the site. During field surveys, Transco noted that all three ditches were covered in grass and lacked an observable ordinary high water mark. Transco would try to avoid all waterbodies located at the proposed construction storage yard during construction. However, because they are located in the temporary construction workspace, temporary impacts to these ditches could occur due to equipment/material staging and driving equipment across the ditches to install the communication tower and guy wires. As indicated in table B-2, each crossing would involve timber mats or similar materials to minimize impacts. No trenching or soil disturbance is anticipated to occur within these ditches as a result of the Project construction activities.

### **Compressor Station 30**

There is one perennial stream (Jones Creek) that borders the existing Compressor Station 30 site. The stream and the facility site are separated by fencing. Transco would not cross Jones Creek. However, Transco is requesting a modification to the FERC Procedures to conduct construction activities within its fence line 25 feet of Jones Creek.

### **Compressor Station 35**

Four small manmade drainage features (swales) are located throughout the Compressor Station 35 site. During field surveys, Transco noted that these swale features lacked a discernable bed and bank or ordinary high water mark. There is also an

additional larger drainage ditch that runs along the south, east, and west boundaries of the site, draining to a bayou approximately 200 feet south of the site. Because some of the drainage ditches are located in the temporary construction workspace, temporary impacts to these ditches could occur due to equipment/material staging and driving equipment across the ditches to install the communication tower and guy wires. As indicated in table B-2, each crossing would involve timber mats or similar materials to minimize impacts. No trenching or soil disturbance is anticipated to occur within these ditches as a result of the Project construction activities.

To minimize impacts to water resources during construction and operation of the Project, Transco would implement its Plan and Procedures. Crews would maintain a silt fence around the drainage features to be avoided during construction and implement best management practices to limit impacts on drainage features from construction activities. After construction is complete, Transco would ensure that temporary workspace areas are revegetated, original contours are restored, and the permanent footprint is stabilized with an impervious surface.

**TABLE B-2  
Waterbodies Affected by the Project**

Site Location	Feature ID	Waterbody Type	Feature Description	FERC Waterbody Classification <sup>a/</sup>	Impact	Acreage Impacted <sup>b/</sup>	
						Const. <sup>c/</sup>	Perm.
Compressor Station 32	W-013	Ephemeral	Drainage ditch	Minor	Culvert	0.2	0.2
Compressor Station 40 (Existing Station)	W-006	Ephemeral	Drainage ditch	Minor	Crossing <sup>d/</sup>	0.2	0
	W-007	Ephemeral	Drainage ditch	Minor	Open cut	0.4	0
Compressor Station 35	W-018	Ephemeral	Drainage ditch	Minor	Crossing <sup>d/</sup>	<0.1	0
	W-019	Ephemeral	Drainage ditch	Minor	Crossing <sup>d/</sup>	<0.1	0
	W-020	Ephemeral	Drainage ditch	Minor	Crossing <sup>d/</sup>	<0.1	0
	W-021	Ephemeral	Drainage ditch	Minor	Crossing <sup>d/</sup>	<0.1	0
Construction Storage Yard/ Communication Tower	W-001	Ephemeral	Drainage ditch	Minor	Crossing <sup>d/</sup>	<0.1	0
	W-002	Ephemeral	Drainage ditch	Minor	Crossing <sup>d/</sup>	<0.1	0

Notes:  
a/ Minor – includes all waterbodies less than or equal to 10 feet wide at the water’s edge at the time of crossing.  
b/ All impact acreages provided are approximate.  
c/ Includes construction temporary workspace within the facility property limits.  
d/ Temporary impact from equipment/material staging and driving equipment across the ditches. Crossing would involve timber mats or similar materials to minimize impacts.

Spills, leaks, or other releases of hazardous materials during construction or operation of the proposed compressor stations could adversely impact water quality. Transco would minimize the risk of accidental leaks and spills by following best management practices contained in its Plan including, no storage of hazardous materials, chemicals or lubricating oils, and no parking of vehicles overnight within 100 feet of the edge of a waterbody or wetland, unless otherwise approved by FERC. Transco would also follow protection measures included in its SPRP to minimize the risk of spills of fuels and hazardous materials and ensure prompt cleanup should such a spill occur. The SPRP addresses personnel training, hazardous substance storage and disposal procedures, refueling areas, spill response procedures, mitigation measures, and the best management practices designed to reduce or eliminate potential adverse impacts on surface water resources.

In Texas, stormwater discharges from oil and gas facilities remain in part under the jurisdiction of the EPA, if they are subject to regulation under the federal National Pollution Discharge Elimination System (NPDES) program, as discussed in Texas Administrative Code Title 16, Part 1, Chapter 3, Rule 3.30 Memorandum of Understanding Between the RRC and the TCEQ under Section (e)(6)(A). Stormwater discharges from construction and operation of the new compressor station facilities would be exempt from industrial stormwater permitting, which is consistent with the EPA published a Final Rule: Amendments to the Storm Water Regulations for Discharges Associated with Oil and Gas Construction Activities. To facilitate stormwater drainage, Transco would construct a system of drainage features within the proposed compressor station facilities in accordance with state permit requirements.

Due to limited impacts on ephemeral waterbodies and Transco's adherence to its Plan, Procedures, and its SPRP, we conclude that the Project would not have a significant impact on waterbodies.

### **Hydrostatic Test Water**

In compliance with USDOT requirements, Transco would perform hydrostatic testing of the new piping at the compressor station facilities prior to placing them into service. The Project would require about 375,000 gallons of water for hydrostatic testing. Transco would obtain all hydrostatic test water from local municipalities or Transco's existing on-site water wells. Transco would apply for water withdrawal permits, as required, through the TCEQ prior to pipeline construction. All hydrostatic test discharge activities would be performed in accordance with Transco's Plan and applicable permit requirements.

After testing is completed, Transco would discharge the water into a well-vegetated upland area within or adjacent to the facility. Crews would discharge waters using an energy dissipating device to minimize erosion and sedimentation and provide additional filtering. Test water would not be discharged directly into streams/rivers. Transco would not use chemicals for testing or drying the pipeline following the hydrostatic testing.

### **Wetlands**

Transco completed field delineations for wetlands in the Project area in February, May and June 2016 and March 2017. There are two palustrine emergent marshes (PEM) wetlands at the existing Compressor Station 40 site. One of the wetlands (W-012) encompasses most of the western portion of the site, while the other wetland (W-011) is located in the southeast corner of the site and surrounded by access roads and berms. Two PEM wetlands were observed in the survey area at Site 27, but these wetlands would be avoided during construction of the communication towers.

Due to limited upland areas within and adjacent to the Compressor Station 40 property, Transco would temporarily impact about 5.3 acres of PEM wetlands. Dominant vegetation in this wetland includes spikerush, bulrush, jointed flatsedge and bushy bluestem. The site, which is mostly PEM wetland, is surrounded by agricultural fields (rice farms) to the north and east and pine/hardwood forest (silviculture) to the south and west. Therefore, Transco would need to locate temporary workspace (laydown and storage areas) within PEM wetlands. Transco provided sufficient justification for deviations to Section VI.B.1.a. of the FERC Procedures, which requires that extra work areas should be at least 50 feet from wetland boundaries, except where the adjacent uplands consist of cultivated or rotated cropland or other disturbed land. Transco's requested modifications to the FERC Procedures are shown in table A-1 in section A.6.

Transco would implement the wetland construction techniques specified in the Procedures to minimize impacts on wetlands. These measures include: (1) limiting the amount of equipment and use of temporary workspace in and adjacent to wetlands to the maximum extent possible; (2) using equipment stabilization such as timber mats within wetlands; (3) limiting grading in wetlands; and (4) conducting follow-up monitoring to ensure that each wetland becomes re-established successfully. Transco would ensure that all wetlands affected would be restored to preconstruction elevation and allowed to revegetate naturally following construction. Construction crews would minimize the risk of accidental leaks and spills by following Transco's Plan and Transco's SPRP. Transco would also adhere to all federal, state, and local regulations and permit requirements regarding wetland impacts.

The Project would not have permanent impacts on wetlands. Because of Transco's measures to minimize impacts and restore all wetlands after construction, we conclude that the Project would not have a significant impact on wetlands.

## **B.4 Vegetation and Wildlife**

### **Vegetation, Habitat Types, and Wildlife**

The Project would occur in agricultural areas and open/developed land. The vegetation cover in these areas is mostly corn (agricultural areas), scrub-shrub uplands dominated by huisache, and herbaceous areas dominated by bermudagrass and huisache growth. Developed areas consist of frequently mowed grasses. There is an emergent wetland community (PEM wetland) within the existing Compressor Station 40 site, as described previously. One of Transco's existing sites includes a small group of trees (live oak and green ash), but these trees would not be affected by Project activities. Site 27 consists of open land consisting of a mosaic of woody, scrub-shrub, and herbaceous vegetation containing several species of grasses, sugarberry, Chinese tallow tree, and dense stands of Macartney rose. Table B-3 shows acreages of vegetation cover types

affected by the Project. Developed areas containing mostly paved areas with mowed grasses were not included in the table because these areas are not classified as a vegetation cover type.

<b>TABLE B-3 Construction and Operation Impacts on Vegetation Cover Types (Acres)</b>						
<b>Facility</b>	<b>Herbaceous/scrub shrub</b>		<b>Agricultural Crops</b>		<b>Emergent Wetland</b>	
	<b>Construction</b>	<b>Operation</b>	<b>Construction</b>	<b>Operation</b>	<b>Construction</b>	<b>Operation</b>
<b>Compressor Stations/Interconnect</b>						
Compressor Station 17 (New)	0.0	0.0	49.4	24.6	0.0	0.0
Corpus Christi Interconnect (New)	0.0	0.0	4.5	1.3	0.0	0.0
Compressor Station 23 (New)	55.7	15.0	0.0	0.0	0.0	0.0
Compressor Station 32 (New)	0.0	0.0	30.7	6.2	0.0	0.0
Compressor Station 40 (Existing)	0.0	0.0	0.0	0.0	5.3	0.0
Communication Tower – Site 27	1.3	0.1	0.0	0.0	0.0	0.0
<b>Access Roads</b>						
Compressor Station 23 Access Road (AR-23)	2.2	0.8	0.0	0.0	0.0	0.0
Compressor Station 32 Access Roads (AR-32 / AR32-01)	0.0	0.0	0.4	0.4	0.0	0.0
Site 27 Communication Tower Access Road	0.1	0.1	0.0	0.0	0.0	0.0
<b>PROJECT TOTALS</b>	<b>59.3</b>	<b>16.0</b>	<b>85.0</b>	<b>32.5</b>	<b>5.3</b>	<b>0.0</b>

Typical wildlife species that could inhabit the areas affected by the Project include the American crow, cattle egret, mourning dove, coyote, eastern cottontail, raccoon, striped-skunk, white-tailed deer, red-tailed hawk, American kestrel, scissor-tailed flycatcher, northern mocking bird, house sparrow, Virginia opossum, and the nine-banded armadillo. Species that could utilize wetlands in the Project area include the swamp rabbit, great blue heron, great egret, white ibis, red-winged black bird, green tree frog, northern cricket frog, and diamond-back watersnake.

Upland grass and scrub shrub habitat provides habitat for ground nesting birds and bedding and foraging opportunities for small mammals. Snakes, lizards, and other reptiles could also utilize these areas for basking, shading, and foraging.

Some aquatic species and amphibians could utilize man-made ponds and drainage ditches during wetter periods when standing water is present. However, these areas are generally considered low quality habitat because they are located at existing industrial sites.

Transco has agreed to adopt TPWD's recommendations including general impacts and avoidance measures for wildlife which are detailed below:

- A. avoiding and/or minimizing potential impacts on migratory birds by vegetation clearing outside the March 15-September 15 migratory bird nesting season in order to fully comply with the Migratory Bird Treaty Act (MBTA). If clearing must occur during nesting season, prior to clearing, the vegetation to be cleared should be surveyed for active nests by a qualified biologist. If active nests are observed, a 150-foot buffer of vegetation should remain around the nest until the young have fledged or the nest is abandoned.
- B. using the most recent Texas Natural Diversity Database (TXNDD) database information as well as consulting with TPWD Annotated County List of Rare Species to determine if habitats for state-threatened species occurs within the project area. An on-the-ground survey by qualified biologist should be performed in areas of suitable habitat to determine if species are present. If present, actions or best management practices to avoid impacts to these species should be taken.
- C. during excavation when excavated area is left open, the excavated area should have an escape ramp placed at multiple locations. This would allow wildlife to escape should they fall into the excavated area. Should a state listed species be trapped in the excavated area, they should be removed by personnel permitted by TPWD to handle state-listed species.
- D. a pre-construction survey should be conducted to determine if horned lizards are present within Project sites. Surveys should be conducted during warmer months of the year when horned lizards are active. Fact sheets, including survey protocols and photos can be found on TPWD website. Avoid

- disturbance of the Texas horned lizard and colonies of the Harvest ant during clearing and construction. If horned lizards are found on site. Contact TPWD to discuss relocation options, particularly if there is likelihood the species would be harmed by Project activities. Also, use the best management practices described in TPWD's Texas Horned Lizard Watch – Management and Monitoring Packet which can be found on TPWD's website.
- E. Project plans should include comments to inform contractors of the potential for the state-listed snake species to occur in the Project area. Contractors should be advised to avoid impacts to Texas indigo snakes and other snakes as long as the safety of the workers is not compromised. TPWD encourages construction sites to have a “no kill” policy in regards to wildlife encounters.
  - F. monitoring the listing status of the spot-tailed earless lizard throughout the Project planning, construction, and operation that occurs in the Project areas and perform consultation, permitting, and mitigation with the USFWS if the species becomes listed under the Endangered Species Act (ESA). Contractors should be instructed to avoid impacting any individuals of this species if found on site within the easement.

## **Fisheries**

There are no perennial streams or other suitable aquatic habitat to support fisheries populations, fisheries of special concern, or essential fish habitat within the construction or operational footprint of the compressor station sites. Man-made ponds at Project sites may support common small fish species such as Texas shiners, fathead minnows, bullhead catfish, suckers, and larger species of shiners, sunfish, black bass, catfish, temperate bass, gar, and crappie. Given the low quality habitat, ephemeral nature of the agricultural or roadside drainage ditches within the Project areas, and the lack of any state or federal designation, the waterbody features present in the Project areas are not likely to support any fisheries of special concern.

The nearest perennial waterbody feature with suitable aquatic habitat to support fisheries populations is Jones Creek, which borders the northern portion of the existing Compressor Station 30 site. No construction activities would directly impacts Jones Creek and Transco would follow its Procedures to minimize any potential indirect impacts. Transco is requesting permission to modify the FERC Procedures because construction activities could occur within 25 feet of Jones Creek (see table A-1).

In general, construction of the Project would have short-term and minor long-term impacts on vegetation and wildlife habitat, resulting in localized impacts on wildlife populations. Project construction could have direct impacts, including mortality for species with limited mobility, such as small amphibians and mammals. Adult mammals, birds, and some reptiles would be mobile enough to avoid mortality during construction

activities. Following construction, wildlife species would be expected to resume their normal habits.

The Project would also result in indirect impacts on wildlife species through habitat removal and noise disturbance from construction activities and vehicle traffic. The magnitude of these impacts on wildlife resources depends on several factors including the type and duration of disturbance, species of wildlife present, the time of year, and the implementation of recommended and required mitigation measures. Most impacts on wildlife from construction activities would be short-term, localized, and temporary. Permanent impacts on wildlife would result from the conversion of habitats from open land to industrial areas consisting of permanent buildings.

Because no perennial streams, fisheries, or essential fish habitat are located within the proposed Project areas, the Project would not impact any fisheries of concern. Transco would avoid impacts on man-made ponds in the Project area that could support small fish species. Indirect impacts to warmwater fisheries in adjacent waterbodies, such as Jones Creek, could occur from offsite erosion and sedimentation. However, to avoid impacts to offsite resources, Transco would implement the erosion and sediment control best management practices contained in Transco's Plan and Procedures. Transco would also implement the SPRP to minimize the risk of spills of fuels and hazardous materials and ensure prompt cleanup should such a spill occur.

Transco would minimize impacts on wildlife by conducting and timing construction activities in accordance with rules and guidance from regulatory agencies. Given that vegetation cover and foraging habitats are relatively abundant in the surrounding areas and Transco's adherence to its Plan, including restoration of areas temporarily affected, we conclude that impacts on vegetation and wildlife resources would be minimal.

## **Migratory Birds**

Migratory birds are species that nest in the United States and Canada during the summer, and make short or long-distance migrations for the non-breeding season. Neotropical birds migrate to and from the tropical regions of Mexico, Central and South America, and the Caribbean.

Migratory birds are protected under the MBTA (16 U.S. Code 703-711), and Bald and Golden Eagles are additionally protected under the Bald and Golden Eagle Protection Act (16 U.S. Code 668-668d). The MBTA, as amended, prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, or nests unless authorized under a USFWS permit. Executive Order 13186 directs federal agencies to identify where unintentional take is likely to have a measurable negative effect on migratory bird populations and avoid or minimize adverse impacts on migratory

birds through enhanced collaboration with the USFWS, and emphasizes species of concern, priority habitats, and key risk factors, and that particular focus should be given to population-level impacts.

On March 30, 2011, the USFWS and the Commission entered into a Memorandum of Understanding (MOU) that focuses on avoiding or minimizing adverse effects on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the Commission and the USFWS by identifying areas of cooperation. This voluntary MOU does not waive legal requirements under the MBTA, the ESA, the NGA, or any other statutes and does not authorize the take of migratory birds.

Most of the Project area is within the Bird Conservation Region (BCR) 37 (Gulf Coastal Prairie of the U.S.) with the exception of Compressor Station 40, which is within BCR 25 (West Gulf Coastal Plain/Ouachitas). BCR 37 is characterized by flat grasslands and marshes, which are located near the coast of the Gulf of Mexico. BCR 25 is characterized by shortleaf pine in the north and longleaf pine in the south. Appendix A-1 shows bird species listed on the USFWS' Birds of Conservation Concern (BCC) list within BCR 37 and 25 that have the potential to breed in the Project area.

Transco did not find any nesting habitat within the proposed Project workspaces for any of the BCCs with the potential to breed in the area. Transco intends to begin construction in late December or January, so land clearing activities would occur outside of peak primary nesting season of migratory birds, which is March 15 through September 15. Because birds are highly mobile, they would likely avoid the Project areas during construction.

Communication towers could result in a flying hazard to some birds, particularly the communication tower that would be constructed using guy wires. Transco would install bird diverters on guy wires to minimize the risk of collision. To avoid and minimize impacts on migratory birds, Transco would construct the communication towers in accordance with the USFWS *2016 Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning*. Lighted towers would be lit in accordance with Federal Aviation Administration (FAA) obstruction and marking standards (i.e., FAA Advisory Circular AC 70/7460-1L) and the USFWS' 2016 recommendations.

Transco would provide environmental training to the Environmental Inspectors, all other inspectors and the construction contractors and ensure all construction personnel are educated in the measures relative to migratory birds. Should clearing activities be conducted within the migratory bird nesting season, Transco would have a qualified biologist survey for active nests prior to commencing work. In the event an active nest is found, Transco would provide a 150-foot buffer around any identified active nests until

the young have fledged or the nest is abandoned. Transco would coordinate with USFWS and TPWD to ensure protection of any identified active nests in accordance with the MBTA.

In addition to the MBTA, the bald eagle and golden eagle receive protection under the Bald and Golden Eagle Protection Act. There is no bald eagle or golden eagle habitat present in the Project area. Communication towers would be located at least 2,500 feet away from the nearest known bald eagle nest, active wood stork colony, or other wading bird nesting colony.

Based on the type of land use and habitat that would be affected, Transco's adherence to a vegetation clearing window outside of the nesting season, and Transco's implementation of USFWS' recommendations for the construction and operation of communication towers, we have determined that construction and operation of the Project would not result in population-level impacts or significant measureable negative impacts on birds of conservation concern or migratory birds.

### **Special Status Species**

Special status species are those species for which state or federal agencies provide an additional level of protection by law, regulation, or policy. Included in this category are federally listed and federally proposed species that are protected under the Endangered Species Act (ESA), or are considered as candidates for such listing by the USFWS, and those species that are state-listed as threatened or endangered.

Transco, acting as the FERC's non-federal representative for the purpose of complying with Section 7(a)(2) of the ESA, initiated informal consultation with the USFWS regarding federally listed threatened and endangered species (T&E) potentially affected by the Project. The USFWS identified 17 federally listed T&E that could potentially occur in the Project area. Transco identified suitable habitat for two of these species – the northern Aplomado falcon (*Falco femoralis septentrionalis*) and Eskimo curlew (*Numenius borealis*). The USFWS also suggested that the whooping crane (*Grus americana*) may utilize the Project areas and could be affected by the Project.

The USFWS identified five candidate species that could occur in the Project area, including Sprague's pipit (*Anthus spragueii*), Golden Orb (*Quadrula aurea*), Texas Fawnsfoot (*Truncilla macrodon*), Texas Pimpleback (*Quadrula petrina*), and Smooth Pimpleback (*Quadrula houstonensis*). Candidate species are provided no statutory protection under the ESA; however, candidate species were included with the assessment of threatened and endangered species. Transco did not identify suitable habitat for the Candidate species and, therefore, we conclude that the Project would have no effect on these species.

Transco consulted the TPWD annotated county lists of rare, threatened, or endangered species that are known to potentially occur in Hardin, Wharton, Victoria, Refugio, and San Patricio counties. State-listed species with suitable habitat in the Project area include the black-spotted newt (*Notophthalmus meridionalis*), sheep frog (*Hypopachus variolosu*), Bachman’s sparrow (*Peucaea aestivalis*), Eskimo curlew, and northern Aplomado falcon, the latter two of which are also federally listed.

Table B-4 provides information for all special status species with the potential to occur in the Project area. A discussion of the species that could be affected by the Project is provided below.

<b>Table B-4</b>			
<b>Threatened and Endangered Species with the Potential to occur in the Project Area</b>			
<b>Species</b>	<b>Listing Status</b>	<b>Habitat</b>	<b>Potential for Occurrence and Effect Determination</b>
<b>Northern Aplomado falcon</b> <i>(Falco femoralis septentrionalis)</i>	Federal: Endangered  State: Endangered	Open country, especially savanna and open woodland, and sometimes very barren areas. Utilizes grassy plains and valleys with scattered mesquite, yucca, and cactus	Refugio and San Patricio Counties, TX  Possible migrant foraging over Project area <b>May Affect, not likely to adversely affect</b>
<b>Eskimo Curlew</b> <i>(Numenius borealis)</i>	Federal: Endangered  State: Endangered	Found in grasslands, pastures, plowed fields, and less frequently on marshes and mudflats	San Patricio County, TX  Possible wintering migrant over Project area <b>May Affect, not likely to adversely affect</b>
<b>Whooping Crane</b> <i>(Grus americana)</i>	Federal: Endangered  State: Endangered	Potential migrant throughout most of state to coast. Winters in coastal marshes of Aransas, Calhoun, and Refugio counties	Wharton, Victoria, Refugio, and San Patricio Counties, TX  Possible migrant over Project area <b>May Affect, not likely to adversely affect</b>
<b>Black-spotted Newt</b> <i>(Notophthalmus meridionalis)</i>	State: Threatened	Moist areas such as arroyos, canals, ditches, or shallow depressions with submerged vegetation	Victoria, Refugio, and San Patricio Counties, TX  Potential habitat at Compressor Stations 20 and 23 <b>Not likely to impact</b>

<b>Table B-4</b>			
<b>Threatened and Endangered Species with the Potential to occur in the Project Area</b>			
<b>Species</b>	<b>Listing Status</b>	<b>Habitat</b>	<b>Potential for Occurrence and Effect Determination</b>
<b>Sheep Frog</b> <i>(Hypopachus variolosus)</i>	State: Threatened	Grassland and savannas; moist sites in arid areas	Refugio and San Patricio Counties, TX  Potential habitat at Compressor Stations 20 and 23 <b>Not likely to impact</b>
Bachman's Sparrow <i>(Aimophila aestivalis)</i>	State: Threatened	Open pine woods with scattered bushes and grassy understory, brushy or overgrown grassy hillsides, overgrown fields with thickets and brambles, grassy orchards, remnant grasslands in Post Oak Savannah region.	Hardin County, TX  Potential habitat at Compressor Station 40 <b>Not likely to impact</b>

### Federally Listed Species

#### ***Northern Aplomado Falcon***

The northern Aplomado falcon is federally and state-listed as endangered in Refugio and San Patricio counties. The northern Aplomado falcon inhabits open grasslands dispersed with patches of shrubs or trees or bordered by forests. Shrubs and trees may provide perching and nesting sites. Their diet consists primarily of other birds but they may also consume insects, bats, rodents, lizards, and other small animals. These falcons may take over nests of other birds rather than build their own nests.

Suitable habitat may be present adjacent to the proposed Project areas at Compressor Station 17/Corpus Christ Interconnect (San Patricio County) and Compressor Station 20 (Refugio County). It is possible that the falcon could utilize the sites while foraging; however, adjacent areas also provide suitable foraging habitat. Given their highly mobile and transient nature, they would most likely avoid the Project areas during construction. Therefore, we conclude that the Project *may affect, but would not likely adversely affect* the northern Aplomado falcon. The USFWS concurred with this determination in an email from Mary Orms (USFWS) to Amanda Mardiney (FERC Biologist) dated July 27, 2017.

### *Eskimo Curlew*

The Eskimo curlew is federally and state-listed as endangered. The Eskimo curlew spends winters in Texas and was historically found in grasslands, pastures, plowed fields, and sometimes marshes and mudflats. The Eskimo curlew is considered critically endangered and possibly extinct. Potential suitable foraging habitat may be present in the vicinity of Compressor Station 17/Corpus Christi Interconnect during the winter months. Because abundant wintering and foraging habitat occurs adjacent to the Project area and individuals would most likely avoid the site during construction activities, we conclude that the Project *may affect, but would not likely adversely affect* the Eskimo curlew. The USFWS concurred with this determination in an email from Mary Orms (USFWS) to Amanda Mardiney (FERC Biologist) dated July 27, 2017.

### *Whooping Crane*

The whooping crane is federally listed endangered species that inhabits a variety of habitats including marsh, tidal flats, and uplands. The Project lies within the 200-mile migration corridor of the whooping crane, which extends from Canada to the Texas coast. Whooping cranes arrive at wintering grounds on the Texas coast between late-October and mid-November. In the spring, they fly back to their breeding grounds between March 25 and May 1. In recent years, whooping cranes have been extending their time spent on wintering grounds, coming earlier and staying later in the season. Most crane losses occur during migration rather than on wintering grounds.

According to the USFWS, the availability of stopover habitat is essential to migrating cranes. Whooping cranes fly at lower altitudes when seeking stopover habitats and will fly low for up to two miles from a stopover site to forage. They may also interrupt migration flights to drink and/or forage in agricultural fields or wetlands for brief periods and may be at low altitudes during mid-day. The cumulative loss of suitable stopover habitat may cause whooping cranes to endure extended flights, resulting in the use of more energy reserves, increased exposure to risks (e.g., collisions, predation), and the use of suboptimal habitat.

Due to these factors, the USFWS recommends that Transco adopt appropriate measures to avoid and minimize impacts on whooping cranes. The USFWS' recommended Transco follow the specific measures listed below.

1. Avoid construction during the whooping crane season, October 15th to April 15th. If that is not possible implement measure 7, below.
2. Employees are educated on the appearance, status and measures to be implemented relating to the whooping crane.
3. If a whooping crane appears within 1,000 feet of the project area, a biological monitor or project manager with the authority to stop work will be notified.

4. All work will cease until the whooping cranes move beyond the 1,000 foot buffer.
5. The presence of a whooping crane will be documented (date, time, activity).
6. The monitor or project manager will notify the Whooping Crane Coordinator, Wade Harrell at Aransas National Wildlife National Wildlife Refuge, (361) 286-3559 or the Service's Texas Coastal Office, Corpus Christi Office, at (361) 994-9005 of the whooping crane's sighting.
7. If large equipment or cranes 15 feet or taller in height are being used, that equipment will be lowered at night if possible or flagged to assist in avoiding or minimizing potential whooping crane collisions.

Because Transco cannot avoid the whooping crane season, they have agreed to implement recommendations 2 through 7 listed above to avoid impacts on the whooping crane. In a letter dated September 22, 2016 the USFWS provided Transco with concurrence that due to the implementation of these measures, the Project *may affect, but would not likely adversely affect* the whooping crane (USFWS 2016a).

Since September 2016, Transco modified the Project to include communication towers and several modifications of project activities at specific sites. Transco sent a letter to the USFWS informing them of these project changes. Transco informed the USFWS that they would construct the towers using the USFWS 2016 *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning*. The USFWS concluded that because, the new cell towers would follow FAA and USFWS recommendations, potential effects would be negligible and discountable.” (USFWS 2017). We conclude that the Project *may affect, but would not likely adversely affect* the whooping crane, Eskimo curlew, and northern Aplomado falcon due to Transco’s adherence to the protection measures requested by the USFWS. The USFWS concurred with this determination and therefore consultation under Section 7 of the ESA is complete.

### State-listed Species

#### ***Black-spotted Newt***

The black-spotted newt is state listed as threatened in Victoria, Refugio, and San Patricio counties. The black-spotted newt inhabits temporary ponds, road side ditches, and quiet stream pools. Potential habitat may exist at the proposed construction storage yard (Decommissioned Compressor Station 20), where a man-made pond is located at the southeast corner of the property. Transco noted that this pond was dry at the time of survey, but may retain water during wetter periods. Transco would avoid impacts on the dry pond. In general, the drainage areas at the site are routinely mowed and usually do not retain sufficient moisture for prolonged durations. There is also an agricultural ditch along the southern and eastern boundary of the proposed Compressor Station 23 that could provide habitat for the newt. Transco’s surveyors noted that parts of the ditch

contained 1-2 inches of standing water during field surveys. However, the drainage ditches at this site are not likely to be sufficiently inundated for prolonged periods. These sites are not likely to have high enough quality habitat to support the black-spotted newt.

Transco did not find evidence that the black-spotted newt inhabits these areas during field surveys, and the areas identified as suitable habitat would not be directly impacted during construction. Therefore, we conclude that impacts on the black-spotted newt would not be likely.

### ***Sheep Frog***

The sheep frog is state listed as threatened in Refugio and San Patricio Counties, Texas. The sheep frog inhabits moist sites in grasslands and savannas and typically breeds in temporary pools following heavy rains. They have been found to inhabit temporary wet areas including roadside ditches, railroad right-of-way ditches, and natural pothole basins. Sheep frogs will migrate from underground sites to ephemeral ponds formed during and after it rains.

The same man-made pond and agricultural ditches described above may provide potential habitat. These sites are not likely to have high enough quality habitat to support the sheep frog.

Transco did not find evidence that the sheep frog inhabits these areas during field surveys, and the areas identified as suitable habitat would not be directly impacted during construction. Therefore, we conclude impacts on the sheep frog would not be likely.

### ***Bachman's Sparrow***

The Bachman's sparrow is state listed as threatened in Hardin County, Texas. The Bachman's sparrow inhabits open pine or oak woods, palmetto scrub, bushy pastures, and open grassy areas. These birds can be found utilizing open areas such as clear-cuts, powerline right-of-ways, and old pastures. Their diet consists of mostly seeds and insects. Females construct nests from grasses usually on the ground at the base of a shrub, clump of grass, or a palmetto.

Although Transco did not identify individuals or nests during the field surveys, potential habitat may exist at Compressor Station 40 given that the Bachman's sparrow utilizes a diverse range of habitats, including open grassy areas. Project activities at this site would be limited in scope and occur within an existing facility site. Because there is an abundance of suitable habitat outside of the existing compressor station, the Bachman's sparrow would be able to avoid the site during construction and operation. Furthermore, construction is proposed to begin in fall of 2017, so land clearing activities would occur outside of the Bachman's sparrow nesting season. Therefore, we conclude

that construction and operation of the Project would not likely impact the Bachman's sparrow.

### **Other state-listed species**

In a letter dated October 10, 2016 from TPWD to the Secretary of the Commission, TPWD provided recommendations for Transco to follow during construction regarding protection of state-listed species and specific sensitive species such as the Texas horned lizard, spot-tailed earless lizard, and state-listed snakes that could occur in the Project area. Transco has agreed to follow several of TPWD's recommendations, which are listed below.

1. Transco would provide environmental training to the Environmental Inspectors, all other inspectors and the construction contractors and ensure all construction personnel are educated in the protection measures relative to state-listed species.
2. When practicable, Transco would utilize escape ramps in open trenches or excavated areas to prevent wildlife from becoming trapped in a trench. If escape ramps are not practicable, Transco would implement alternative measures as recommended by TPWD. If any state-listed species become trapped in an excavated site, the trapped species would be removed by personnel permitted by the TPWD.
3. Transco would adopt a "no-kill" policy in regard to wildlife encounters including but not limited to the Texas indigo snake and other non-venomous snakes. The policy would allow encountered snakes and other wildlife to safely leave the site on their own.
4. Transco would monitor the listing status of the spot-tailed earless lizard and perform consultation with the USFWS if the species becomes listed under the ESA. Transco would provide environmental training to the Environmental Inspectors, all other inspectors and the construction contractors and ensure all construction personnel are educated in the measures relative to the spot-tailed earless lizard.
5. Prior to construction, Transco would conduct a pre-construction survey, in accordance with TPWD protocols, to determine if Texas horned lizards are present within the project site. TPWD further recommends that Transco avoid disturbance and minimize impacts to Texas horned lizards by using best management practices in the *Texas Horned Lizard Watch – Management and Monitoring Packet*. TPWD also recommends if a Texas horned lizard is found on site during construction, Transco should contact TPWD for relocation options.

## **Conclusion**

Table B-4 provides a summary of the species discussed above. Due to Transco's implementation of mitigation measures, the temporary duration of ground disturbing activities, and the small permanent footprint of the Project, we conclude the Project would not have significant impacts on special status species during construction and operation.

## **B.5 CULTURAL RESOURCES**

Section 106 of the National Historic Preservation Act, as amended, requires the FERC to take into account the effect of its undertakings on properties listed, or eligible for listing, on the National Register of Historic Places (NRHP), and to afford the Advisory Council on Historic Preservation an opportunity to comment. Transco, as a non-federal party, is assisting the FERC in meeting our obligations under Section 106 and its implementing regulations at 36 CFR Part 800.

Transco completed cultural resources surveys for Compressor Stations 17, 23, and 32, the associated access roads, and the Corpus Christi Interconnect. A total of 292 acres was surveyed. The survey included both archaeological and architectural resources. The resulting survey report was provided to the FERC and the Texas State Historic Preservation Office (SHPO). As a result of the surveys, no archaeological or architectural resources were identified. On July 29, 2016, the SHPO concurred with the results of the report. Transco also contacted the SHPO regarding the activities at Compressor Stations 30 and 40, and the contractor yard at Compressor Station 20. On May 17, 2016, the SHPO indicated that no historic properties would be affected. In addition, Transco provided a "Categorical Exclusion" agreement with the SHPO identifying minor construction activities that would not require review by the SHPO, to be used by Transco as applicable.

Subsequently, Transco identified project modifications and conducted additional cultural resources survey for Compressor Stations 27 and 35, and additional visual assessments for proposed microwave tower locations at Compressor Stations 17, 20, 23, 27, and 32. As a result of the survey, one historic archaeological site and one architectural resource (a residence) were identified. Both were recommended as not eligible for the NRHP. On June 26, 2017, the SHPO indicated that no historic properties would be affected by the project. We concur with the SHPO and have determined that the project would not affect historic properties.

Transco contacted the Comanche Nation of Oklahoma and the Tonkawa Tribe of Oklahoma regarding the project, and provided both tribes with the survey report. In letters dated June 15 and July 28, 2016, the Comanche Nation indicated "no properties" had been identified by the project. No response has been received from the

Tonkawa Tribe of Oklahoma. We sent our NOI to these same tribes. No response to our NOI has been received. In addition, in response to our NOI, the Bureau of Indian Affairs indicated it had no concerns with the project.

Transco provided a plan to address the unexpected discovery of historic properties and human remains during construction. We requested revisions to the plan. Transco provided a revised plan which we find acceptable.

## **B.6 LAND USE, RECREATION, AND AESTHETICS**

### **Land Use**

Land uses in the Project areas consist of agriculture, commerce/industrial, open land, and wetlands. Agriculture and open land is the dominate land use surrounding the Project facilities. In total, about 228 acres of land would be disturbed during construction and about 52 acres for operations. Construction of the Project would affect almost equal proportions of three land use categories: agricultural, commercial/industrial, and open. Table B-5 summarizes the land use requirements associated with construction and operation of the Project.

The Project would not affect any federally-designated or recognized natural, recreational, or scenic areas, wildlife refuges, National Parks, state parks, golf courses, public or private hunting areas, Indian reservations, wild and scenic rivers, trails, wilderness areas, or natural landmarks or other public lands. The Project would not cross or impact coastal zone management areas.

Land use would be temporarily affected by construction activities and permanently affected by operations. However, with the exception of the new compressor stations and communication tower, land use would return to its previous use. For example, construction affects about 85 acres of agricultural land, but only 32.5 acres would be retained for operations. The remaining 52.5 acres could be placed back into agricultural production following restoration. Furthermore, there are no residences within 50 feet of the Project.

### **Visual Resources**

The Project would not be located within any federal, state, or locally designated scenic areas, such as National Wild and Scenic Rivers and scenic highways. The Project could alter existing visual resources in three ways: (1) construction activity and equipment may temporarily alter the viewshed; (2) clearing along the right-of-way during construction would alter existing vegetation patterns; and (3) aboveground facilities would create permanent alterations to the viewshed.

The new compressor stations would be visible from the adjacent roadways (west, east, north and south). Compressor stations 23 and 32 each have one residence located more than 4,000 feet from the stations. Based on distance and location within the existing landscape, as well as some vegetation or existing structures that would screen or partially obscure views, the compressor stations would pose varying degrees of viewshed impacts on the two identified residences.

The proposed communication towers would be within the existing property boundaries and would not cross or be within any federal, state, or locally designated visual resource. There are no major parks or recreational features within the view of the proposed communication towers. We conclude that the Project would not have a significant impact on visual resources.

## **Conclusion**

Based on the proximity of existing industrial infrastructure and the limited scope of activity, we do not anticipate that the Project would have a significant impact on land use, recreational activities, visual resources, or coastal zone management areas.

Table B-5 Land Use Affected By Construction and Operation of the Proposed Project								
Facility	County, State	Land Use Affected By Construction				Land Use Affected By Operation		
		Open	Agricultural	Wetland (PEM)	Commerce /Industrial	Open	Agricultural	Commerce/ Industrial
Compressor Station 17	San Patricio, TX	0	49.4	0	0.7	0	24.6	0.3
Corpus Christi Interconnect	San Patricio, TX	0	4.5	0	0.1	0	1.3	0.1
Compressor Station 23	Victoria, TX	55.7	0	0	0	15.0	0	0
Compressor Station 30	Wharton, TX	0	0	0	18.4	0	0	<0.1
Compressor Station 32	Wharton, TX	0	30.7	0	0	0	6.2	0
Compressor Station 35	Harris, TX	0	0	0	16.9	0	0	0.8
Compressor Station 40	Hardin, TX	0	0	5.3	13.2	0	0	0.1
Communication Tower Site 27	Jackson, TX	1.3	0	0	0	0.1	0	0
Construction Storage Yard (Decommissioned Compressor Station 20)	Refugio, TX	0	0	0	18.9	0	0	1.0
Compressor Station 17 Access Road (AR-17)	San Patricio, TX	0	0	0	9.1	0	0	0
Construction Storage Yard 20 Access Road (AR-20)	Refugio, TX	0	0	0	0.9	0	0	0.9
Compressor Station 23 Access Road (AR-23)	Victoria, TX	2.2	0	0	0	0.8	0	0
Compressor Station 32 Access Road (AR-32/AR32-01)	Wharton, TX	0	0.4	0	0	0	0.4	0
Communication Tower Site 27 Access Road (AR-27)	Jackson, TX	0.1	0	0	0	0.1	0	0
<b>Total</b>		<b>59.3</b>	<b>85</b>	<b>5.3</b>	<b>78.2</b>	<b>16.0</b>	<b>32.5</b>	<b>3.2</b>

## **B.7 AIR QUALITY AND NOISE**

### **Air Quality**

Air quality in the Project area would be affected by construction and operation of the Project. Although air emissions would be generated by construction activities involving the proposed compressor stations, interconnect, piping and valve modifications, the majority of air emissions associated with the Project would result from operation of the new Compressor Stations 17 and 23. Compressor Station 32 is an electric motor-driven compressor that would not result in direct operational emissions.

### **Existing Air Quality**

The Project area encompasses five counties in southeastern Texas: Wharton, Victoria, Hardin, San Patricio and Refugio Counties. The climate in the Project area is characterized as warm during the summer with an average daily temperature greater than 86 degrees Fahrenheit, and cool during winter with an average daily high temperature around 68 degrees Fahrenheit. Precipitation is generally well-distributed throughout the year with slightly more precipitation in summer and fall, and an average annual precipitation of 52.7 inches.

Federal and state air quality standards are designed to protect human health. The EPA has developed National Ambient Air Quality Standards (NAAQS) for criteria air pollutants such as oxides of nitrogen (NO<sub>x</sub>) and carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and inhalable particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>). PM<sub>2.5</sub> includes particles with an aerodynamic diameter less than or equal to 2.5 micrometers, and PM<sub>10</sub> includes particles with an aerodynamic diameter less than or equal to 10 micrometers. The NAAQS were set at levels the EPA believes are necessary to protect human health and welfare. Volatile organic compounds (VOC) and hazardous air pollutants (HAP) are also emitted during fossil fuel combustion. At the state level TCEQ has adopted the NAAQS, as promulgated by the EPA, and does not have any additional standards.

Air quality control regions (AQCR) are areas established by the EPA and local agencies for air quality planning purposes, and through 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. Each AQCR, or portion thereof, is designated based on compliance with the NAAQS for each pollutant. Compressor Stations 17, 23, and 32 are located in the San Patricio, Victoria, and Wharton counties. Wharton County is located within the Metropolitan Houston-Galveston Intrastate AQCR and San Patricio and Victoria counties are located within the Corpus Christi-Victoria Intrastate AQCR. Temporary construction-related emissions will

also occur in Hardin County, which is located in the Southern Louisiana-Southeast Texas Interstate AQCR. The construction-related emissions in Refugio County are considered negligible. All project-related AQCRs are classified as either “better than national standards”, “unclassifiable” (insufficient data is available, however areas are treated as attainment), or “attainment” (criteria pollutant concentrations are less than the NAAQS).

The EPA, state and local agencies have established a network of ambient air quality monitoring stations to measure concentrations of criteria pollutants across the U.S. The data are then used by regulatory agencies to determine compliance with the NAAQS and if an area is in attainment, nonattainment (criteria pollutant concentrations exceed the NAAQS) or maintenance (area was formerly nonattainment and is currently attainment). The entire Project area is designated attainment for all criteria pollutants.

Greenhouse Gases (GHG) produced by fossil-fuel combustion are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O). GHGs status as a pollutant is not related to toxicity. 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 Clean Air Act. GHGs emissions due to human activity are the primary cause of increased levels of all GHG since the industrial age. These elevated levels of GHGs are the primary cause of warming of the climate system since the 1950s. These existing and future emissions of GHGs, unless significantly curtailed, will cause further warming and changes to the local, regional and global climate systems. During construction and operation of the Project, these GHGs would be emitted from construction equipment. Emissions of GHGs are typically expressed in terms of CO<sub>2</sub> equivalents (CO<sub>2e</sub>).

### **Permitting/Regulatory Requirement**

Air quality in the United States is regulated by federal statutes in the Clean Air Act (CAA) and its amendments. The provisions of the CAA that are applicable to the Project are discussed below.

### **Prevention of Significant Deterioration and Nonattainment New Source Review**

Proposed new or modified air pollutant emission sources must undergo a New Source Review (NSR) prior to construction or operation. Through the NSR permitting process, state and federal regulatory agencies review and approve project emissions increases or changes, emissions controls, and various other details to ensure air quality does not deteriorate as a result of new or modified existing emission sources. The three basic categories of NSR permitting are Prevention of Significant Deterioration (PSD), Nonattainment New Source Review (NNSR), and minor source NSR. PSD, NNSR, and NSR are applicable to projects depending on the size of the proposed project, the projected emissions, and if the project is located in an attainment area or nonattainment/maintenance area. The TCEQ administers the PSD and NNSR permitting

programs in Texas. PSD regulations define a major source as any source type belonging to a list of name source categories that have a potential to emit 100 tons per year (tpy) or more of any regulated pollutant or 250 tpy for sources not among the listed source categories. These are referred to as the PSD major source thresholds.

Compressor stations 17, 23, and 32 are not anticipated to exceed the PSD major source thresholds for any pollutants and are considered minor sources located in attainment areas. Therefore, the proposed construction and operation of Compressor Stations 17, 23, and 32 does not trigger PSD or NNSR Review.

### **Title V Permitting**

Title V is an operating air permit program run by each state for each facility that is considered a “major source.” The major source threshold level for an air emission source is 100 tpy for criteria pollutants, 10 tpy for any single hazardous air pollutant (HAP) and 25 tpy for total HAPs. The proposed Compressor Stations 17, 23, and 32 are considered minor sources and would therefore not require a Title V permit.

### **New Source Performance Standards**

The EPA promulgates New Source Performance Standards (NSPS) to establish emission limits and fuel, monitoring, notification, reporting, and recordkeeping requirements for stationary source types or categories. These regulations apply to new, modified, or reconstructed sources. NSPS Subpart JJJJ sets emissions standards for nitrogen oxides (NO<sub>x</sub>), CO, and volatile organic compounds (VOC) for emergency and non-emergency engines. Subpart JJJJ would apply to the emergency generators at Compressor Stations 17, 23, and 32.

NSPS Subpart KKKK applies to stationary combustion turbines with a heat input rating greater than or equal to 10 million British thermal units per hour and sets limits on NO<sub>x</sub> and SO<sub>2</sub> emissions. Subpart KKKK applies to Compressor Stations 17 and 23.

NSPS Subpart OOOOa sets requirements for new, modified, or reconstructed wet seal centrifugal compressor and reciprocating compressor; limits for bleed rates for natural-gas driven pneumatic controllers; requires work practice standards for compressor rod packing compressor units; and sets leak detection and repair requirements for fugitive emission components. The various components of Subpart OOOOa would apply, as applicable, to Compressor Stations 17, 23, and 32. Transco anticipates that any pneumatic supply gas controllers procured for the Project will be continuous low-bleed, intermittent bleed, or operate on supplied air. Transco will also be required to perform leak survey and repairs at Compressor Stations 17, 23, and 32 as required, to address fugitive equipment emissions. Note that at the time of this document’s publication, Subpart OOOOa is currently under review by the EPA.

## **National Emission Standards for Hazardous Air Pollutants**

The 1990 CAA Amendments established a list of 189 hazardous air pollutants (HAPs), resulting in the promulgation of National Emission Standards for Hazardous Air Pollutants. The National Emission Standards for Hazardous Air Pollutants regulate HAP emissions from specific source types located at major or area sources of HAPs by setting emission limits, monitoring, testing, record keeping, and notification requirements. Compressor Stations 17, 23, and 32 would be an area source of HAPs. Subpart ZZZZ applies to all reciprocating internal combustion engines at area sources and would therefore apply to the emergency generators at Compressor Stations 17, 23, and 32. However, Transco would comply with Subpart ZZZZ by meeting the requirements of NSPS JJJJ.

### **General Conformity**

The lead federal agency must conduct a conformity analysis if a federal action would result in the generation of emissions that would exceed the conformity threshold levels of the pollutant(s) for which a county is designated nonattainment or maintenance.

General conformity assessments must be completed when the total direct and indirect emissions of a project would equal or exceed specified pollutant thresholds on a calendar year basis for each nonattainment or maintenance area. The operational emissions that would be permitted or otherwise covered by major or minor New Source Review (NSR) permitting programs are not subject to the general conformity applicability analysis. Estimated emissions for the Project are not subject to review under the general conformity thresholds because the Project is in an area classified as attainment/unclassifiable for all criteria pollutants.

### **Greenhouse Gas Emissions and the Mandatory Reporting Rule**

The EPA's Mandatory Reporting of Greenhouse Gases Rule requires reporting from applicable sources of GHG emissions if they emit greater than or equal to 25,000 metric tons of GHG (as CO<sub>2</sub>e) in one year. The Mandatory Reporting Rule does not require emission control devices and is strictly a reporting requirement for stationary sources based on actual emissions. Although the rule does not apply to construction emissions, we have provided GHG construction emission estimates, as CO<sub>2</sub>e, for accounting and disclosure purposes in this section. Operational GHG emission estimates for the Project are presented, as CO<sub>2</sub>e, in table B-8. Based on the emission estimates presented, actual GHG emissions from operation of Compressor Stations 17 and 23 will likely exceed the 25,000 tpy reporting threshold for the Mandatory Reporting Rule. Recent additions to the Mandatory Reporting Rule effective for calendar year 2016 require reporting of GHG emissions generated during operation of the natural gas pipeline transmission system, which would include blowdown emissions, equipment leaks, and vent emissions at compressor stations, as well as blowdown emissions between compressor stations (40 CFR 98 Subpart W). Also, 40 CFR 98 Subpart W would apply

to the entire commonly owned Transco system. The various components of the Mandatory Reporting Rule and Subpart W would apply specifically to Compressor Stations 17, 23, and 32 if the actual emissions from any of the compressor stations are greater than 25,000 metric tpy.

### **State Air Quality Regulations**

This section discusses the potentially applicable state air regulations for the proposed facility. In addition to federal standards, the TCEQ establishes permit review procedures for all facilities with pollutant emissions. Any new or modified facility is required to obtain an air quality permit prior to initiating construction. Additional review may then be triggered if emissions exceed PSD major source thresholds, however Compressor Stations 17, 23, and 32 are anticipated to be minor sources and additional review is not required. State permit applications to register Compressor Stations 17, 23 and 32 were submitted in September 2016.

### **Construction Impacts and Mitigation**

Air emissions would be generated during construction of all Project components. Construction activities for the proposed activities would result in temporary increases in emissions of some pollutants due to the use of equipment powered by diesel or gasoline engines. Construction activities would also result in the temporary generation of fugitive dust due to land clearing and grading, ground excavation, and driving on unpaved roads. Emissions would also be generated by delivery vehicles and construction workers commuting to and from work areas on paved roads.

Construction emission estimates were based on the fuel type and anticipated frequency, duration, capacity and levels of use of various types of construction equipment. Construction emissions were estimated using emission factors provided in EPA's NONROAD (2008) and Mobile Vehicle Emissions Simulator (MOVES, 2010) software. Fugitive dust emissions were conservatively estimated using the Western Regional Air Partnership Fugitive Dust Handbook (WRAP, 2006). Table B-6 provides Project total construction emissions, including tailpipe emissions from on-road and off-road construction equipment and vehicles, construction worker vehicles for commuting, and vehicles used to deliver equipment/materials to the site, as well as fugitive dust from construction activities and wind erosion of disturbed areas prior to revegetation.

Table B-6 Potential Construction Emissions for the Project (tpy)									
Location <sup>1</sup>	Source	NOx	CO	VOC	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	Total HAPS	GHG <sup>2</sup>
San Patricio County, TX	Tailpipe Emissions	38.71	46.74	3.96	2.72	2.63	0.05	<0.01	8,334
	Fugitive Dust	-	-	-	11.57	3.37	-	-	-
	Total	38.71	46.74	3.96	14.29	6	0.05	<0.01	8,334
Victoria County, TX	Tailpipe Emissions	33.12	38.26	3.35	2.32	2.25	0.04	<0.01	7,052
	Fugitive Dust	-	-	-	9.72	2.84	-	-	-
	Total	33.12	38.26	3.35	12.04	5.09	0.04	<0.01	7,052
Wharton County, TX	Tailpipe Emissions	37.72	45.98	3.88	2.65	2.56	0.04	<0.01	8,101
	Fugitive Dust	-	-	-	11.01	3.23	-	-	-
	Total	37.72	45.98	3.88	13.66	5.79	0.04	<0.01	8,101
Hardin County, TX	Tailpipe Emissions	4.6	7.72	0.53	0.32	0.31	0.01	<0.01	1,049
	Fugitive Dust	-	-	-	1.29	0.39	-	-	-
	Total	4.6	7.72	0.53	1.61	0.7	0.01	<0.01	1,049
<b>Project Total<sup>3</sup></b>		<b>114.15</b>	<b>138.7</b>	<b>11.72</b>	<b>41.6</b>	<b>17.58</b>	<b>0.14</b>	<b>&lt;0.01</b>	<b>24,536</b>
1	Refugio County construction-related emissions were considered miniscule due to intermittent use and were not calculated								
2	As CO <sub>2e</sub>								
3	All construction emissions were conservatively predicted to occur in 2018; emissions will likely be spread over 16 months								

The construction phase of the proposed Project would result in the generation of diesel and gasoline combustion emissions associated with the operation of construction equipment and vehicles. Transco will use construction equipment and vehicle engines that are properly maintained and comply with EPA mobile and non-road emission regulations. Equipment will be operated on an as-needed basis, and buses or vans will be used to transport construction workers to the work site to the extent practicable.

Fugitive dust would result from land clearing, grading, excavation, concrete work, and vehicle traffic on paved and unpaved roads. The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and roadway characteristics. Emissions would be greater during dry periods and in areas of fine-textured soils subject to surface activity. Transco has prepared a Dust Control Plan<sup>4</sup> that describes the mitigation

<sup>4</sup> The Applicants' Dust Control Plan was included as appendix 9D to Resource Report 9 in its August 2016 application (Accession No. 20160816-5260). The Dust Control Plan can be viewed on the FERC website at

measures that would be implemented to control fugitive dust during Project construction. We have reviewed the Dust Control Plan and find it acceptable.

Project construction would occur over an approximate 11-month period commencing in the fall of 2017. These construction emissions would occur over the duration of construction activity and would be emitted at different times and locations throughout the Project. Construction emissions would be minor and would result in short-term impacts in the vicinity of Compressor Stations 17, 20, 23, 30, 32, 40 and Corpus Christi Interconnect. Open-burning is not anticipated for Project construction, but if burning becomes necessary, Transco would comply with all applicable state and local regulations. With the mitigation measures proposed by Transco, air quality impacts from construction equipment would be temporary and should not result in a significant impact on regional air quality.

### **Operational Impacts and Mitigation**

The Project will generate air emissions during the operation of one 7,800 horsepower (hp) gas turbine-driven compressor unit and an emergency generator at Compressor Station 17, two 10,800 hp gas turbine-driven compressor units and an emergency generator at Compressor Station 23, and an emergency generator at Compressor Station 32. Compressor Station 32 will have a 1,250 hp electric motor-driven compressor unit and will not generate direct emissions.

Compressor Stations 17, 23, and 32 would also generate emissions from ancillary process equipment, including a total of three 4,200-gallon oily-water storage tanks, three 8,820-gallon capacity natural gas condensate liquids storage tanks, blowdown activities, and fugitive emissions from piping components.

The Corpus Christi Interconnect is anticipated to have emissions from blowdown activities and fugitive emissions from piping components. Fugitive emissions associated with the piping and valve modifications at existing Compressor Stations 30 and 40 are anticipated to be minor and are not included in the Project emissions estimates. Table B-7 provide the annual potential emissions for the Compressor Stations 17, 23, and 32 and Corpus Christi Interconnect.

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<http://www.ferc.gov>. Using the “eLibrary” link, select “Advanced Search” from the eLibrary menu and enter 20160816-5260 in the “Numbers: Accession Number” field.

Table B-7 Potential Operational Emissions for the Project (tpy)										
Project Component	County in Texas	NO <sub>x</sub>	CO	VOC	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	Total HAPS	Formaldehyde	GHG (CO <sub>2</sub> e)
Corpus Christi Interconnect <sup>1</sup>	San Patricio	-	-	0.19	-	-	-	0.03	0.03	403
Compressor Station 17 <sup>2</sup>	San Patricio	18.85	29.51	5.23	2.09	2.09	1.08	1.08	0.91	41,668
Compressor Station 23 <sup>3</sup>	Victoria	48.09	91.02	9.23	5.53	5.53	2.85	2.75	2.42	107,240
Compressor Station 32 <sup>4</sup>	Wharton	1.17	0.76	2.92	<0.01	<0.01	<0.01	0.06	0.03	1,943
<i>PSD Major Source Thresholds</i>		<i>250</i>	<i>250</i>	<i>250</i>	<i>250</i>	<i>250</i>	<i>250</i>	<i>-</i>	<i>-</i>	<i>100,000</i>
<i>Title V Major Source Thresholds</i>		<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>25</i>	<i>10</i>	<i>100,000</i>
1	includes fugitive emission leaks and blowdowns									
2	includes one compressor turbine, startups/shutdowns, blowdowns, one emergency generator, condensate tank, oily water tank, and fugitive equipment leaks									
3	includes two compressor turbines, startups/shutdowns, blowdowns, one emergency generator, condensate tank, oily water tank, and fugitive equipment leaks									
4	Includes one emergency generator, blowdowns, condensate tank, oily water tank, and fugitive equipment leaks									

Estimates of fugitive emissions from all piping components at Compressor Stations 17, 23, and 32, and the Corpus Christi Interconnect were included in table B-7. In order to minimize fugitive emissions from valves, seals and other piping components, and from operation and maintenance activities, the Applicant would comply with EPA's 40 CFR Part 98, Subpart W and would comply with EPA's proposed 40 CFR Part 60, Subpart OOOOa standards, which both require leak detection and repair programs. In addition, the Applicant is a member of the EPA Natural Gas STAR program to share best practices for reducing methane emissions. Fugitive methane emissions are a source of GHG emissions from the proposed Project.

Air quality modeling was completed to determine potential regional air quality impacts from the Project. Modeling was completed for NO<sub>2</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, CO, and SO<sub>2</sub> using the EPA's AERMOD model in screening mode for the Compressor stations 17 and 23.

The results of the modeling analysis indicate that the Project would not cause or significantly contribute to a degradation of ambient air quality, and would result in continued compliance with the NAAQS, which are protective of human health. Table B-8 summarizes the results of the modeling analyses.

<b>Table B-8</b>					
<b>Existing Ambient Air Quality Monitored Values</b>					
<b>Pollutant</b>	<b>Averaging Period</b>	<b>Existing Background (µg/m<sup>3</sup>)<sup>1</sup></b>	<b>Maximum Modeled Concentration (µg/m<sup>3</sup>)</b>	<b>Combined Background and Maximum Model (µg/m<sup>3</sup>)</b>	<b>NAAQS (µg/m<sup>3</sup>)</b>
<b>Compressor Station 17</b>					
CO	1-hour	3,206	24.31	3,230.31	40,000
	8-hour	1,374	21.88	1,395.88	10,000
NO <sub>2</sub>	1-hour	37.6	24.03	61.63	188
	Annual	4.55	2.4	6.95	100
PM <sub>2.5</sub>	24-Hour	24.87	1.72	26.59	35
	Annual	9.23	0.29	9.52	12
PM <sub>10</sub>	24-Hour	62	1.72	63.72	150
SO <sub>2</sub>	1-Hour	10.48	1.47	11.95	196
	3-hour	12.31	1.47	13.78	1,300
	24-Hour	4.19	0.88	5.07	365
	Annual	0.99	0.15	1.14	80
<b>Compressor Station 23</b>					
CO	1-hour	1,946.50	62.48	2008.98	40,000
	8-hour	1,145	56.24	1201.24	10,000
NO <sub>2</sub>	1-hour	37.6	61.57	99.17	188
	Annual	4.55	6.16	10.71	100
PM <sub>2.5</sub>	24-Hour	24.87	4.41	29.28	35
	Annual	9.23	0.73	9.96	12
PM <sub>10</sub>	24-Hour	62	4.41	66.41	150
SO <sub>2</sub>	1-Hour	10.57	3.78	14.35	196
	3-hour	14.41	3.78	18.19	1,300
	24-Hour	5.24	2.27	7.51	365
	Annual	0.24	0.38	0.62	80
1	An average 3-year value (2013, 2014, 2015) was used for background values from most proximate monitor				

The Project would result in direct and indirect GHG emissions. GHG emissions were included in table B-7. The Project's requested certificated capacity is designated for two liquefied natural gas (LNG) facilities in Freeport and Corpus Christi, Texas. The downstream, indirect emissions were quantified assuming full capacity would be 9,200,000 tpy of CO<sub>2e</sub> which assumes 8,760 hours per year at maximum load. Total direct emissions from the Project would be 175,790 tpy of CO<sub>2e</sub>. While we do not know the ultimate fate of the Project's total requested natural gas capacity; some may be used domestically, or may be designated for liquefaction and shipped overseas. The downstream emissions were quantified assuming full capacity and assuming that the emissions were burned and not used as feedstock. If this were to be burned, and not replace coal or fuel-oil in Texas, this volume of GHG emissions would result in a 1.5 percent increase of GHG emissions from fossil fuel combustion in Texas.

## Noise

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.

### Federal and State Noise Regulations

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. The EPA has indicated that an  $L_{dn}$  of 55 dBA protects the public from indoor and outdoor activity interference. We have adopted this criterion and use it to evaluate the potential noise impacts from the proposed Project at noise-sensitive areas (NSAs). Due to the 10 dBA nighttime penalty added prior to the calculation of the  $L_{dn}$ , for a facility to meet the 55 dBA  $L_{dn}$  limit, it must be designed such that actual constant noise levels on a 24-hour basis do not exceed 48.6 dBA  $L_{eq}$  at any NSA.

No other state or local noise regulations were identified for the Project.

### Ambient Noise Conditions

Land use in the vicinity of the proposed Compressor Stations 17, 23, and 32 consist mainly of agriculture and open land. The proposed ambient noise surveys at the NSA nearest to Compressor Stations 17, 23, and 32 were completed on June 17, 2016 and the results are summarized in table B-9.

## **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. Construction equipment would be operated on an as-needed basis during this period. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and local. Noise mitigation measures that would be employed during construction include ensuring that the sound muffling devices, which are provided as standard equipment by the construction equipment manufacturer, are kept in good working order. If needed, additional noise abatement techniques and other measures could be implemented during the construction phase to mitigate construction noise disturbances at NSAs. Nighttime noise is not expected to increase during construction because most construction activities would be limited to daytime hours.

## **Operational Noise Impacts and Mitigation**

The proposed compressor stations would generate noise on a continuous basis (i.e., up to 24 hours per day) when operating. The noise impact associated with the compressor stations would attenuate with distance from the compressor stations. The specific operational noise sources associated with the compressor stations and the estimated impacts at the nearest NSAs are described below.

Transco provided ambient noise surveys and acoustical analyses for NSAs nearest to each Project compressor station. The results of the noise surveys are presented in table B-9.

<b>Table B-9</b>					
<b>Noise Quality Analysis for the Project</b>					
<b>Nearest NSA / Type</b>	<b>Distance and Direction to NSA</b>	<b>Existing Ambient Sound Level (dBA)</b>	<b>Estimated Sound Level Attributable to compressor station (dBA)</b>	<b>Total Sound Level (Station <math>L_{dn}</math> + Ambient <math>L_{dn}</math>) (dBA)</b>	<b>Potential Change in Noise Level Attributable to the Station (dB)</b>
<b>NSA Nearest to Compressor Station 17</b>					
NSA #1 / residence	10,000 feet southeast	49.5	29.6	49.5	0
<b>NSA Nearest to Compressor Station 23</b>					
NSA #2 / residence	4,900 feet northeast	48.1	38.6	48.6	0.5
<b>NSA Nearest to Compressor Station 32</b>					
NSA #3 / residence	4,300 feet southwest	45.7	34	46	0.3

The results of these acoustical analyses presented above in table B-9 included various assumed noise control measures. The noise control measures that Transco committed to take are as follows:

- enclose the new turbines and compressors inside acoustically-insulated metal buildings;
- include a silencer system in the turbine exhaust system that provides dynamic sound insertion loss (DIL);
- include at least one in-duct silencer in the turbine air intake system that provides DIL;
- ensure lube oil coolers do not exceed 65 dBA at 50 feet from the cooler perimeter;
- ensure the sound level generated by the multi-fan gas aftercooler that serves each compressor unit should not exceed 70 dBA at 50 feet at Compressor Stations 17 and 23 and 68 dBA at 50 feet at Compressor Station 32 at full rated operating conditions; and
- ensure gas piping be separated from other metal structures as practicable and suction pipe strainers should be removed soon after the compressor stations are placed in service.

In addition to the operational noise discussed above, there would also be blowdown events during which the pipeline would generate noise for short periods of time (e.g., 1 to 5 minutes). Transco has indicated that these potential blowdown events would be associated with each of the new compressor units, which would each be

outfitted with a blowdown silencer to ensure that the noise attributable to these blowdown events would be 70 dBA at a distance of 300 feet. Given the non-routine nature and short-term duration of these blowdown events, we do not believe that blowdown events would be a significant contributor to operational noise from the Project.

To verify compliance with the FERC's noise standards, **we recommend that:**

- **Transco should file noise surveys with the Secretary no later than 60 days after placing the Compressor Stations 17, 23, and 32 in service. If a full load condition noise survey is not possible at any of the stations, Transco should provide an interim survey at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at Compressor Stations 17, 23, and 32 under interim or full horsepower load conditions exceeds an  $L_{dn}$  of 55 dBA at any nearby noise-sensitive areas, Transco should file a report on what changes are needed and should install the additional noise controls to meet the level within 1 year of the in-service date. Transco should confirm compliance with the above requirement by filing a second noise survey with the Secretary no later than 60 days after it installs the additional noise controls.**

Based on the analyses conducted and mitigation measures proposed, we conclude that the Project would not result in significant noise impacts on residents, and the surrounding communities.

## **B.8 RELIABILITY AND SAFETY**

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

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

The USDOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues, prescribes the minimum standards for operating and maintaining pipeline facilities, and incorporates compressor station design, including emergency shutdowns and safety equipment. Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency.

The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials.

The Project's facilities associated must be designed, constructed, operated, and maintained in accordance with USDOT standards, including the provisions for written emergency plans and emergency shutdowns. Transco would provide the appropriate training to local emergency service personnel before the facilities are placed in service.

The Project's construction and operation would represent a minimum increase in risk to the public and we are confident that with the options available in the detailed design of the Project's facilities, that they would be constructed and operated safely.

## **B.9 CUMULATIVE IMPACTS**

The Project area was settled by American and European settlers in the 1800s, during which the primary industries were cattle ranching and agriculture. This continued and by 1900s most of the Project area's labor force worked in cattle ranching and agriculture. By the first quarter of the 20<sup>th</sup> century, farming had overtaken the region, with cotton becoming the most important cash crop. Today, the Project area economy is supported by energy, chemical and maritime industries, agriculture, and industrial manufacturing.

In accordance with NEPA, we identified other actions located in the vicinity of the Project facilities and evaluated the potential for a cumulative impact on the environment. As defined by the Council on Environmental Quality (CEQ), a cumulative effect is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. CEQ guidance states that an adequate cumulative effects analysis may be conducted by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. In this analysis, we consider the impacts of past projects as part of the affected environment (environmental baseline) which was described and evaluated in the preceding environmental analysis. However, present effects of past actions that are relevant and useful are considered. Actions located outside the geographic scope are generally not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project.

As described in the environmental analysis section of this EA, constructing and operating the Project would temporarily and permanently impact the environment. The Project would impact geology, soils, water resources, vegetation, wetlands, wildlife, cultural resources, visual resources, air quality, noise, and some land uses. However, we conclude that these impacts would not be significant.

We have determined, based on the scope and location of the Project area that the impacts of the Project on geology, soils, groundwater, wetlands, vegetation, fish and wildlife, and cultural resources when added to the impacts of other present and reasonably foreseeable future actions would not result in a meaningful cumulative impact on these resources.

Cumulative impacts on land use and aesthetics; air quality; and noise could occur and are discussed further. The geographic scope boundary for each remaining resource as well as regulatory guidance to determine the geographic scope for each resource was identified.

Based on the impacts of the Project as identified and described in this EA, a discussion of our analysis was based on the following resource-specific geographic scopes appropriate to assess cumulative impacts for the Project area:

Temporary impacts on air quality, including fugitive dust, would be largely limited to areas immediately around active construction about a 0.25 mile. Based on AERMOD modeling results, we determined that long-term impacts on air quality would be largely contained within about a 10-mile radius. We evaluated other projects/actions that overlap in time and location with construction activities and those with potentially significant long-term stationary emission sources within a 10-mile radius of the Project. A table of the projects/actions analyzed can be found in table B-11 below.

Land use and aesthetics impacts are highly localized. Therefore, we evaluated projects/actions that are within 0.5 mile of the Project.

Table B-10 identifies the present and reasonably foreseeable projects or actions that occur within the geographic scope of the new CSs. These projects were identified by a review of publicly available information; aerial and satellite imagery; and information provided by Transco.

The largest project considered is the Corpus Christi Liquefaction, LLC (LNG Terminal) and Cheniere Corpus Christi Pipeline, L.P. Project that would be located approximately 1.1 mile away and the LNG Terminal would impact about 991 acres during construction. Operation of the terminal would impact 469 acres. The Corpus Christi pipeline would impact about 420 acres during construction and 178 acres during operation. The Costal Bend Header Project located 17 miles southeast would impact about 1,171.5 acres during construction, and would impact 536.9 acres of operations. Due to the limited scope of construction and modifications to the existing compressor station associated with the Project in the area near the Costal Bend Header Project significant cumulative impacts are not anticipated and therefore not discussed further in the EA. The projects which may have cumulative impacts on land use, visual, air, and noise, when added to the impacts of the proposed Project are discussed further in this section.

In addition to the geographic relationship between the Project and other projects in the area, we also consider the temporal relationship between the Project and other projects in the area.

### **B.9.1 Land Use and Aesthetics**

The past, present and reasonably foreseeable future actions identified in table B-10 would result in temporary disturbances/losses of use and permanent conversions of land uses. As described previously, about 228 acres of land would be disturbed during construction of the Project. About 52 acres of land would be maintained for permanent

operation of the Project. Potentially affected land use would include primarily agricultural lands, open land, and commercial/industrial lands.

The Corpus Christi LNG Terminal is being constructed on property located on the northern shore of the Corpus Christi Bay. At the north end of the La Quinta Channel, north and east of the city of Corpus Christi in San Patricio (land-based facilities) and Nueces (Marine facilities) Counties, Texas. The terminal, currently under construction, is located west of the Sherwin Alumina Plant and on previously used industrial land. About 991 acres will be affected by construction of the terminal and 469 acres will be affected by operation of the terminal including the exclusion zone. Construction of the facility will have some visual impacts; however, because existing industrial nature of the land we believe that the visual impacts of this project would be minor. Furthermore, the terminal will be located in an industrialized area and there are no residences, schools, community parks, or public areas located within 1 mile of the terminal.

Construction of the Corpus Christi Pipeline, L.P. Project will affect about 420 acres. Operation of the pipeline will affect about 178.3 acres. About 296 acres of land used during construction is agricultural land of which 133.3 acres will be used for operations. About 93 acres of open land will be used for construction of which 38.4 will be used for operations. The remaining acres are currently used for industrial use. The majority of the agricultural and open land will be restored back to previous use. Therefore, construction and operation of the project would not result in significant long-term land use impacts.

As previously identified, the Project could also temporarily and permanently impact visual resources. These impacts include changes to the viewshed resulting from the placement of permanent buildings/structures. Other land use conversions and new structures built in support of other projects within the geographic scope could potentially result in a cumulative impact. However, we have determined that the impacts of the Project on land use and visual resources when added to the impacts of other past, present and reasonably foreseeable future actions would not result in a significant cumulative impact.

## **B.9.2 Air Quality and Noise**

Construction of reasonably foreseeable future projects and activities within the region of influence that may impact air quality are listed in table B-11 below. Construction would involve the use of heavy equipment that would generate emissions of air contaminants, fugitive dust, and noise. Construction and operation of the Compressor Station 17, 23 and to a lesser extent, 32 would contribute cumulatively to air quality impacts. The combination of these effects would contribute to a cumulative impact on air quality in the region.

<b>Table B-10 Potential Cumulative Impacts in the Project Vicinity</b>				
<b>Project Name</b>	<b>Approximate Distance (miles)</b>	<b>Status</b>	<b>Description</b>	<b>Anticipated Project Timeline</b>
<b>San Patricio County (Proposed CS 17)</b>				
Corpus Christi Liquefaction, LLC and Cheniere Corpus Christi Pipeline, L.P. Project Docket #: (CP12-507-000)	various parts of project range from 1.1 miles (compressor station) to 20 miles (export terminal) south	Under Construction	three liquefaction trains with 700 MMscf per day, three LNG storage tanks, two LNG carrier docks, 23-miles of 48-inch-diameter pipeline, and two additional compressor stations totaling (53,260 hp)	Operational 2018
Cheniere Corpus Christi LNG Stage 3 Project Docket #: (PF15-26-000)	various parts of project range from 1.1 miles (compressor station) to 20 miles (export terminal) south	Still in pre-filling no updates	Two additional liquefaction trains each with a capacity of 4.5 mtpy, 22-mile-long 42-inch pipeline, and an additional compression of 44,000 hp	undetermined
<b>Victoria County (Proposed CS 23)</b>				
Victoria WLE Power Station Expansion	7.4 miles north-northwest	Permits received, pending construction	installation of new 197 MW gas turbine and one new 483 MMBtu/hr heat recovery steam generator	December 2017-December 2018
Equistar Chemical Plant	1.8 miles southwest	Commenced	amendments to existing permits	currently operational
Invista s.a.r.l Victoria Plant	2.6 miles southwest	Multiple phases, some already under construction, others to begin construction in 2017	operational modernization to petrochemical manufacturing facility	operational late 2017
E.I. DuPont Victoria Plant	2.1 miles southwest	currently operational	increases in operating hours and emissions to meet demand; replacement of initiator pumps	currently operational

Table B-10 Potential Cumulative Impacts in the Project Vicinity				
Project Name	Approximate Distance (miles)	Status	Description	Anticipated Project Timeline
<b>Wharton County (Proposed CS 32)</b>				
Gulf South Coastal Bend Header Project	pipeline: adjacent; compressor station: 17 miles southeast	Permits received, pending construction	66 miles of new 36-inch-diameter pipeline	2017 - April 2018
Leedo Manufacturing Facility	8.8 miles northeast	currently operational	modifications to existing facilities	currently operational

The Corpus Christi LNG Terminal will have the following construction emissions in tpy: NO<sub>x</sub> = 6,805, VOC = 784, CO = 6,531, SO<sub>2</sub> = 439, PM<sub>10</sub> = 4,813, PM<sub>2.5</sub> = 1,119 and CO<sub>2e</sub> = 622,135. Operational emissions in tpy will be: NO<sub>x</sub> = 2,319, VOC = 143.1, CO = 2,010, SO<sub>2</sub> = 33.6, PM<sub>10</sub> = 59.1, PM<sub>2.5</sub> = 59.1 and CO<sub>2e</sub> = 3,340,000.

Construction equipment emissions would result in short-term emissions that would be highly localized, temporary, and intermittent. There are no projects listed in table B-11 that are located within 0.25-mile of the Project that will have construction activities occurring at the same time as the Project. Projects with construction occurring concurrently are located sufficiently far away so as not to result in cumulative air quality impacts.

The operation of Compressor Stations 17, 23, and to a lesser extent, 32 will be a source of air emissions and fugitive equipment leaks that will impact air quality. Based on the results of the modeling analysis summarized in table B-8, the maximum modeled concentrations, in addition to background concentrations, are well below the NAAQS. The modeling analysis used a 6.2 mile radius around Compressor Stations 17 and 23 to determine the maximum modeled concentrations. Generally, pollutant concentrations decrease with increasing distance from the source, with the highest concentrations occurring within a few hundred meters of the source. Based on these modeling results, the geographic scope of air quality impacts due to operation was reduced to a 10-mile radius (approximately 20 miles) around each compressor station. Table B-11 lists the nine projects occurring within a 10-mile radius of each compressor station that will contribute to cumulative air quality impact. Each air emissions source listed in table B-11 is regulated by its air permit to conform to federally-approved State Implementation Plans that ensure that national primary and secondary air quality standards are achieved and maintained. These projects must demonstrate compliance with the NAAQS through air dispersion modeling, in addition to other requirements. Air dispersion modeling completed for this Project and summarized in section B.6 demonstrate that the air quality impacts from each compressor station in addition to existing conditions (background)

would continue to be in compliance with the NAAQS and would therefore remain protective of human health.

With the exception of greenhouse gas (GHG) emissions, air quality impacts would be localized and confined primarily to the airshed in which the Project facilities occur. The combined effect of multiple projects occurring in the same airshed and timeframe could temporarily add to the ongoing air quality effects of existing activities. Based on the modeling results and emissions from the permitted source identified in the region of influence, we conclude that there will not be a significant impact to air quality.

The Project could contribute to cumulative noise impacts as a result of both construction and operation of the Project. Noise impacts due to construction would be temporary, highly localized, and attenuate quickly as distance from the noise source increases. There are no projects listed in table B-11 that are located close enough to the Project so as to contribute to cumulative noise impacts during construction. Operation of Compressor Station 17, 23, and 32 will contribute to noise impacts within a mile of the Project. The analysis completed in section B.6 quantifies predicted noise levels, including estimates of project-related noise based on proposed equipment and existing ambient noise levels collected by noise surveys. Predicted impacts to noise levels would likely range from 0 dBA to 0.5 dBA at nearby NSAs. However, the mitigation measures proposed by Transco would ensure that the FERC's noise criterion of 55 dBA would not be exceeded and the overall impact to noise levels would not be significant.

### **Cumulative Impact Conclusion**

Overall, the cumulative impacts of the Project are anticipated to be minimal due to the limited number of resource impacts identified within the Project's geographic scope that could occur during the construction and operation of the Project.

Given that the Project would contribute minor impacts and due to the limited footprint of the other projects within the geographic scope, we conclude that cumulative impacts of the Projects when combined with past, present, and reasonably foreseeable projects would have minimal cumulative effects on all other resources.

## **SECTION C – ALTERNATIVES**

In accordance with NEPA, we evaluated alternatives to Transco’s proposed action. Our evaluation criteria for selecting potentially preferable alternatives are:

- ability to meet the objectives of the proposed action (i.e., providing additional capacity to transport 475,000 dekatherms per day of natural gas),
- technically and economically feasible and practical; and
- provides a significant environmental advantage over the proposed action.

Our evaluation of alternatives is based on project-specific information provided by the applicant; concerned parties; publicly available information; our consultations with federal and state resource agencies; and our expertise and experience regarding the siting, construction, and operation of natural gas transmission facilities and their potential impact on the environment.

### **Evaluation Process**

Through environmental comparison and application of our professional judgment, each alternative is considered to a point where it becomes clear if the alternative could or could not meet the three evaluation criteria. To ensure a consistent environmental comparison and to normalize the comparison factors, we generally use desktop sources of information (e.g., publicly available data, GIS data, aerial imagery) and assume the same right-of-way widths and general workspace requirements. Where appropriate, we also use site-specific information (e.g., field surveys or detailed designs). Our environmental analysis and this evaluation consider quantitative data (e.g., acreage or mileage) and uses common comparative factors such as engineering constraints and land requirements.

The alternatives were reviewed against the evaluation criteria in the sequence presented above. The first consideration for including an alternative in our analysis is whether or not it could satisfy the stated purpose of the project. An alternative that cannot achieve the purpose for the project cannot be considered as an acceptable replacement for the project. All of the alternatives considered here are able to meet the project purpose stated in section A.1 of this EA.

Many alternatives are technically and economically feasible. Technically practical alternatives, with exceptions, would generally require the use of common construction methods. An alternative that would require the use of a new, unique or experimental construction method may not be technically practical because the required technology is not available or unproven. Economically practical alternatives would result in an action that generally maintains the price competitive nature of the proposed action. Generally, we do not consider the cost of an alternative as a critical factor unless the added cost to

design, permit, and construct the alternative would render the project economically impractical.

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. In comparing the impact between resources, we also considered the degree of impact anticipated on each resource. Ultimately, an alternative that results in equal or minor advantages in terms of environmental impact would not compel us to shift the impacts from the current set of landowners to a new set of landowners.

One of the goals of an alternatives analysis is to identify alternatives that avoid significant impacts. In section B of this EA, we evaluated each environmental resource potentially affected by the Project and concluded that constructing and operating the Project would not significantly impact these resources. Consistent with our conclusions, the value gained by further reducing the (not significant) impacts of the Project when considered against the cost of relocating the facility to a new set of landowners was also factored into our evaluation.

## **C.1 NO-ACTION ALTERNATIVE**

Under the no-action alternative, new compression and modifications to existing compression or appurtenant facilities would not be constructed and the Project objectives to provide additional natural gas supplies and firm transportation services would not be met. The existing facilities would continue to operate under current conditions and the environmental impacts identified in this EA would not occur. If the Project is not built, Transco's customers would likely seek alternatives to meet increasing demand of natural gas supplies, which could include the construction and operation of other facilities. Because of the limited footprint of the proposed action, we conclude that it is likely that the other facilities that would need to be constructed to replace the Project would have equal or greater impacts. Therefore, the no-action alternative would not offer a significant environmental advantage over the proposed Project. In addition, the no-action alternative would not meet the objectives of the proposed action.

## **C.2 SYSTEM ALTERNATIVES**

The purpose of identifying and evaluating system alternatives is to determine whether the environmental impacts associated with the construction and operation of the proposed Project could be avoided or reduced by using existing, modified, or other proposed facilities rather than constructing new facilities. We did not identify system alternatives that would meet the Project objectives and provide a significant environmental advantage.

### C.3 COMPRESSOR STATION ALTERNATIVES

The capacity of a pipeline is primarily a function of the diameter of the pipeline. Once the capacity of the pipeline is reached, the pipeline capacity needs to be expanded in order to transport additional gas. This expansion can be achieved by building a new compressor station or adding a new pipeline parallel to the existing pipeline (i.e., looping). We evaluated both approaches to the additional capacity provided by Transco's proposed Project.

In evaluating compressor station siting alternatives, we considered:

- **Footprint** – The site size needs to be adequate for constructing and operating the facilities. Larger sites can provide opportunity to set the facility back from surrounding properties.
- **Site Use** – Vacant land is preferred as pre-existing development on a site may present an unreasonable obstacle to securing control.
- **Availability** – Although section 7(h) of the NGA grants a Certificate holder the right of eminent domain, we prefer the proposed site and alternative sites that are available (such as by purchase, lease, or restrictive easement).
- **Access Road and Lateral Pipeline Length** – We consider the location of the site relative to existing roads and the associated pipeline, as the location will determine the length of the permanent access road and whether a pipeline lateral is required to connect the compressor station to the mainline facilities.
- **Engineering Constraints** – The general location of a compressor station is determined in large part by hydraulic modeling of the natural gas flow in the pipeline. A compressor station must be sited within a milepost range determined by the gas flow modeling in order to sustain the pressure needed to deliver the gas.
- **Environmental** – We consider environmental impacts on resources that may include, but not limited to, noise receptors, prime farmland, wetlands and water resources, vegetation, critical habitat, threatened and endangered species, cultural resources, visual resources, geologic hazards and surrounding land use.

We did not consider alternative locations for the proposed modifications to existing compressor stations because we did not identify alternative locations that could provide a significant environmental advantage over work proposed within an existing developed environment. No stakeholders suggested an alternative compressor station location for our consideration.

We identified one alternate location for Compressor Station 17 that had the potential to minimize environmental impacts. The alternative site would be located on Transco's mainline milepost 148.3. The alternative site consists of open and agricultural lands.

The proposed site has no impacts on wetlands, waterbodies, cultural resources, threatened and endangered species or critical habitats, and is not located within a 0.5 mile of any NSA. The alternative site also has no impacts on these resources; however, the alternative site would need to traverse multiple pipelines in order to tie into CS 17. While the alternative is technically feasible, it would not provide a significant environmental advantage over the proposed facility location.

We identified one alternative location for Compressor Station 32 that had the potential to minimize environmental impacts. The alternative site would be located on Transco's mainline milepost 271.2. The alternative site also consists of agricultural and open lands. Both the proposed site and alternative site have no impacts on wetlands, waterbodies, cultural resources, threatened and endangered species or critical habitats, and would meet FERC's 55 dBA ( $L_{dn}$ ) noise requirement. While the alternative is technically feasible, it would not provide a significant environmental advantage over the proposed facility location.

We identified no alternative sites and we received no stakeholder alternatives for Compressor Station 23.

### Looping

This alternative would utilize pipeline looping to eliminate or minimize the use of the new aboveground compressor stations and air emissions. The loop alternative would require over 200 miles of 42-inch-diameter pipeline looping and would significantly impact the amount of land disturbed as well as impacts on environmental resources and land owners. We estimate that the pipeline alternative would impact at least 2,500 acres of land and dozens of landowners. The alternative would also require impacts on wetlands, waterbodies, and forested lands. Consequently, the alternative would not provide a significant environmental advantage over the proposed facilities.

### **Conclusion**

We reviewed alternatives to Transco's proposal based on our independent analysis. During our review, we received no requests from stakeholders to consider alternatives. Our analysis concludes that no system or alternative site alternatives provide a significant environmental advantage over the Project. In summary, we have determined that the proposed action, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Project's objectives.

## SECTION D – STAFF CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if Transco constructs and operates the proposed facilities in accordance with its application and supplements, and the staff's recommended mitigation measures listed 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 include the measures listed below as conditions in any authorization the Commission may issue to Transco.

1. Transco 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. Transco 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 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 this Order, and take all steps necessary to ensure the protection of life, health, property, and the environment during construction and operation of the project, which shall include:
  - a. the authority to modify conditions of this Order;
  - b. stop-work authority and authority to cease operation; and
  - c. the imposition of any additional measures deemed necessary to assure continued compliance with the intent of the conditions of the Order as well as the avoidance or mitigation of unforeseen adverse environmental impact resulting from project construction and operation.
3. **Prior to any construction**, Transco 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 described in the EA, as supplemented by filed maps and/or alignment sheets. **As soon as they are available, and**

**before the start of construction**, Transco 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 work sites 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.

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

5. Transco shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying any revisions of facility removal sites, staging areas, storage/equipment 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 FERC's Plan and/or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all workspace 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 this authorization and before construction begins**, Transco shall file an Implementation Plan with the Secretary

for review and written approval by the Director of the OEP. Transco must file revisions to the plan as schedules change. The plan shall identify:

- a. how Transco would implement the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests), identified in the EA, and required by the Order;
  - b. how Transco would incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
  - c. the number of EIs assigned per spread, and how the company would ensure that sufficient personnel are available to implement the environmental mitigation;
  - d. company personnel, including EIs and contractors, who would receive copies of the appropriate material;
  - e. the location and dates of the environmental compliance training and instruction Transco would give to all personnel involved with construction and restoration (initial and refresher training as the project progresses and personnel change);
  - f. the company personnel (if known) and specific portion of Transco's organization having responsibility for compliance;
  - g. the procedures (including use of contract penalties) Transco would follow if noncompliance occurs; and
  - h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:
    - i. the completion of all required surveys and reports;
    - ii. the environmental compliance training of onsite personnel;
    - iii. the start of construction; and
    - iv. the start and completion of restoration.
7. Transco shall employ at least one EI for the Project. The EI(s) shall be:
- a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
  - b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
  - c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
  - d. a full-time position, separate from all other activity inspectors;
  - e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements

imposed by other federal, state, or local agencies; and responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Transco shall file updated status reports with the Secretary on a **monthly 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 Transco'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 during the reporting period both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies;
  - d. a description of the corrective actions implemented in response to all instances of noncompliance, and their cost;
  - e. the effectiveness of all corrective actions implemented;
  - f. a description of any landowner/resident complaints that may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
  - g. copies of any correspondence received by Transco from other federal, state, or local permitting agencies concerning instances of noncompliance, and Transco's response.
9. **Transco must receiving written authorization from the Director of the OEP before commencing construction of any Project facilities. To obtain such authorization**, Transco must file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).
10. Transco must receive written authorization from the Director of OEP **before placing the Project into service**. Such authorization would only be granted following a determination that rehabilitation and restoration of the areas affected by the project are proceeding satisfactorily.
11. **Within 30 days of placing the authorized facilities in service**, Transco shall file an affirmative statement with the Secretary, certified by a senior company official:

- a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities would be consistent with all applicable conditions; or
  - b. identifying which of the Certificate conditions Transco has complied with or will comply with. This statement shall also identify any areas affected by the project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.
12. Transco shall file noise surveys with the Secretary **no later than 60 days** after placing Compressor Stations 17, 23, and 32 in service. If a full load condition noise survey is not possible at any of the stations, Transco shall provide an interim survey at the maximum possible horsepower load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at Compressor Stations 17, 23, and 32 under interim or full horsepower load conditions exceeds an  $L_{dn}$  of 55 dBA at any nearby noise-sensitive areas, Transco shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 1 year** of the in-service date. Transco shall confirm compliance with the above requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

## SECTION E – REFERENCES

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## **APPENDICES**

## **APPENDIX A-1**

### **IPaC List of Migratory Birds of Conservation Concern that Breed in the Project Area and Their Potential Breeding Habitats within the Project Area**

**Appendix A-1**  
**IPaC List of Migratory Birds of Conservation Concern that Breed in the Project Area and Their Potential Breeding Habitats Within the Project Area**

Common Name ( <i>Scientific</i> ) <sup>a/</sup>	Relating to Project Site (Compressor Station)	Breeding Habitat <sup>b/</sup>	Nesting Preference <sup>b/</sup>	Breeding Habitat Present Within Project Area
<b>Land Birds</b>				
Dickcissel ( <i>Spiza americana</i> )	17, 20, 23, 30, 32, 40	Tall grasslands, including prairie, hayfields, lightly grazed pastures, and roadsides.	Placed slightly above ground in dense grasses or in trees saplings.	No
Mississippi Kite ( <i>Ictina mississippiensis</i> )	30, 32	Windbreak plantings within shortgrass and mixed prairie, in oak and mesquite savannah, and in cottonwoods and salt cedar lining rivers.	In almost any tree species, nest placement may be several feet to over hundred feet off ground.	No
Orchard Oriole ( <i>Icterus spurius</i> )	40	Open woodlands along river edges, as well as along marsh edges, lakeshores, open shrublands, and farms.	In trees of varying species. Nests are usually attached to forked twigs or branches away from the main trunk at varying heights from the ground.	No
Painted Bunting ( <i>Passerina ciris</i> )	32, 40	Semi-open areas with scattered shrubs or trees. May use abandoned farms, strips of woodland between overgrown fields, brushy roadsides or streamsides, and patches of grasses, weeds, and wildflowers.	Usually 3-6 feet off of the ground in dense foliage.	No

**Appendix A-1  
IPaC List of Migratory Birds of Conservation Concern that Breed in the Project Area and Their Potential Breeding Habitats Within the Project Area**

<b>Common Name (Scientific) <sup>a/</sup></b>	<b>Relating to Project Site (Compressor Station)</b>	<b>Breeding Habitat <sup>b/</sup></b>	<b>Nesting Preference <sup>b/</sup></b>	<b>Breeding Habitat Present Within Project Area</b>
<b>Land Birds (Continued)</b>				
Prothonotary Warbler ( <i>Protonotaria citrea</i> )	30, 32, 40	Breeds in wooded swamps and other bottomland forests.	In low cavities of trees.	No
Swainson's Warbler ( <i>Limnothlypis swainsonii</i> )	30, 32, 40	Southern forests with thick undergrowth (vine entangled), especially canebrakes and floodplain forests in lowlands.	Placed in shrubs.	No
Swallow-tailed Kite ( <i>Elanoides forficatus</i> )	40	Breeds in swamps, lowland forests, and marshes of the southeastern U.S.	In open woodlands or stands of trees.	No
<b>Shore Birds</b>				
Snowy Plover ( <i>Charadrius alexandrinus</i> )	17, 20, 23, 30, 32	Barren to sparsely vegetated sand beaches, dry salt flats in lagoons.	In depressions on dry ground.	No
<b>Water Birds</b>				
Least Bittern ( <i>Lxobrychus exilis</i> )	17, 20, 23, 30, 32, 40	Freshwater or brackish marshes with tall emergent vegetation.	On ground in dense, tall stands of marsh vegetation.	No
Little Blue Heron ( <i>Egretta caerulea</i> )	40	Uses many types of wetlands including swamps, marshes, ponds, streams, lagoons, tidal flats, canals, ditches, fish hatcheries, and flooded fields.	In low shrubs and small trees, in protected areas below the canopy.	No

**Appendix A-1**  
**IPaC List of Migratory Birds of Conservation Concern that Breed in the Project Area and Their Potential Breeding Habitats Within the Project Area**

Common Name ( <i>Scientific</i> ) <sup>a/</sup>	Relating to Project Site (Compressor Station)	Breeding Habitat <sup>b/</sup>	Nesting Preference <sup>b/</sup>	Breeding Habitat Present Within Project Area
<b>Water Birds (continued)</b>				
Louisiana Waterthrush ( <i>Parkesia motacilla</i> )	40	Hilly streams.	Breeds along gravel-bottomed streams though hilly, deciduous forest. Nest placed in small hollow or cavity on stream bank, under fallen log, or within roots of upturned trees.	No

Notes:  
a/ Species list obtained from IPaC (USFWS, 2016a)  
b/ Nesting habitats from All About Birds <https://www.allaboutbirds.org/> (Cornell, 2015a)

**APPENDIX A-2**  
**Site of Proposed Compressor Station 17**

TRANSCO GULF CONNECTOR EXPANSION ENVIRONMENTAL SURVEY SITES - STATION 17 CORPUS CHRISTI INTERCONNECT



LEGEND

- GULF CONNECTOR ENVIRONMENTAL SURVEY SITES
- SOIL - SSURGO

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CHECKED BY:	JW	STATE:	TEXAS
DATE:	2016-06-23	SHEET:	1 OF 7
DWG #:	080149-000	SCALE:	1:3,000

REVISIONS

DATE	REVISION	REV.
2016-06-23	ISSUED FOR REVIEW	A

PREPARED BY

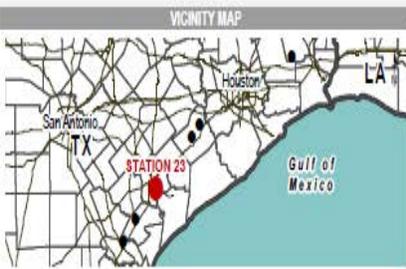
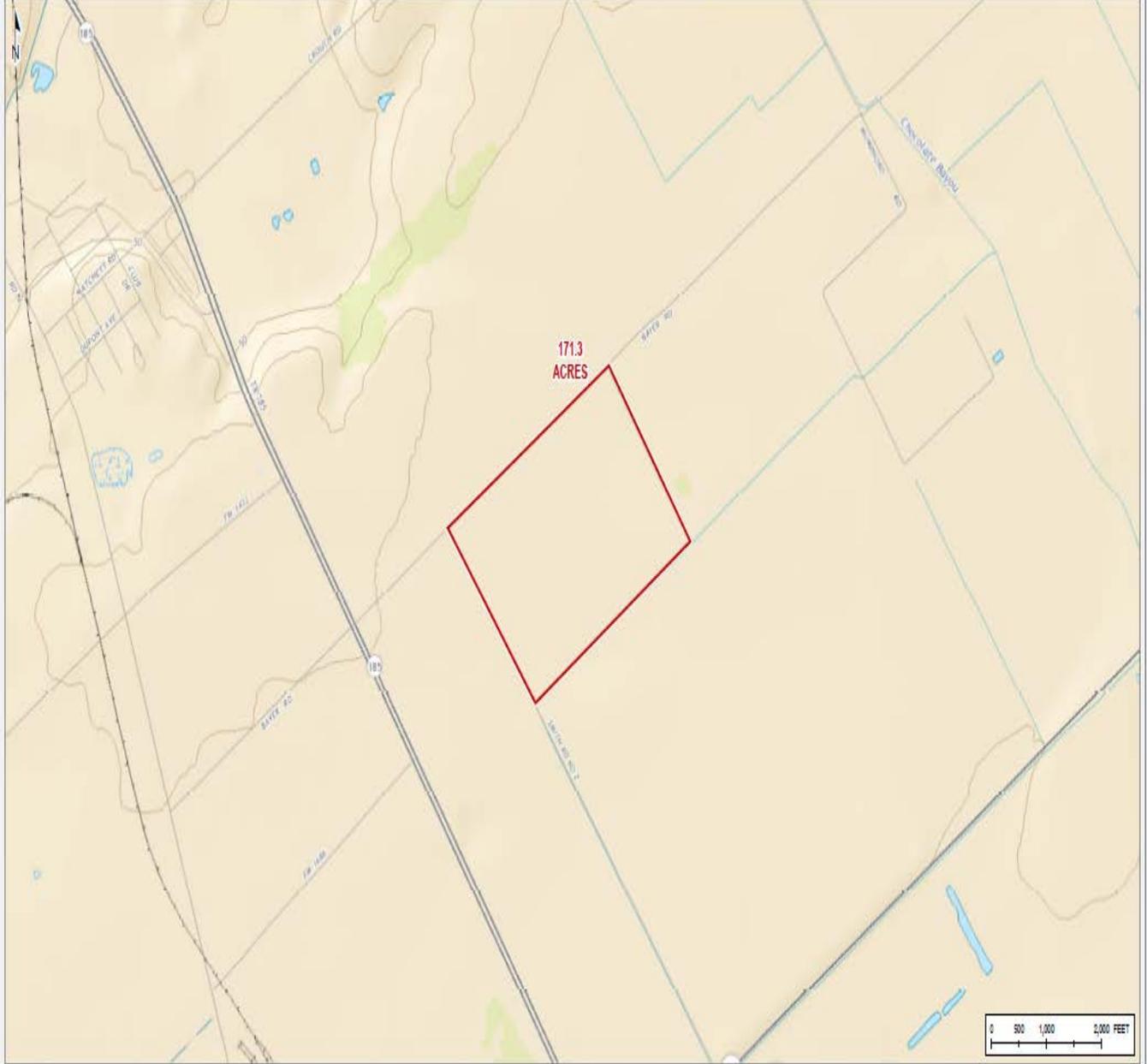
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TRANSCO GULF CONNECTOR EXPANSION

**APPENDIX A-3**  
**Site of Proposed Compressor Station 23**

TRANSCO GULF CONNECTOR EXPANSION PROJECT ENVIRONMENTAL SURVEY SITES - STATION 23



LEGEND

GULF CONNECTOR ENVIRONMENTAL SURVEY SITES

USGS Topographic Map Service:  
<http://basemap.nationalmap.gov/arcgis/rest/services/USGSTopo/MapServer/>

DRAWING INFORMATION

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DATE	REVISION	REV.
2016-06-23	ISSUED FOR REVIEW	A

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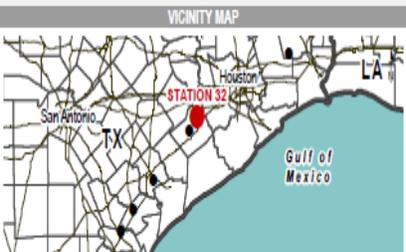
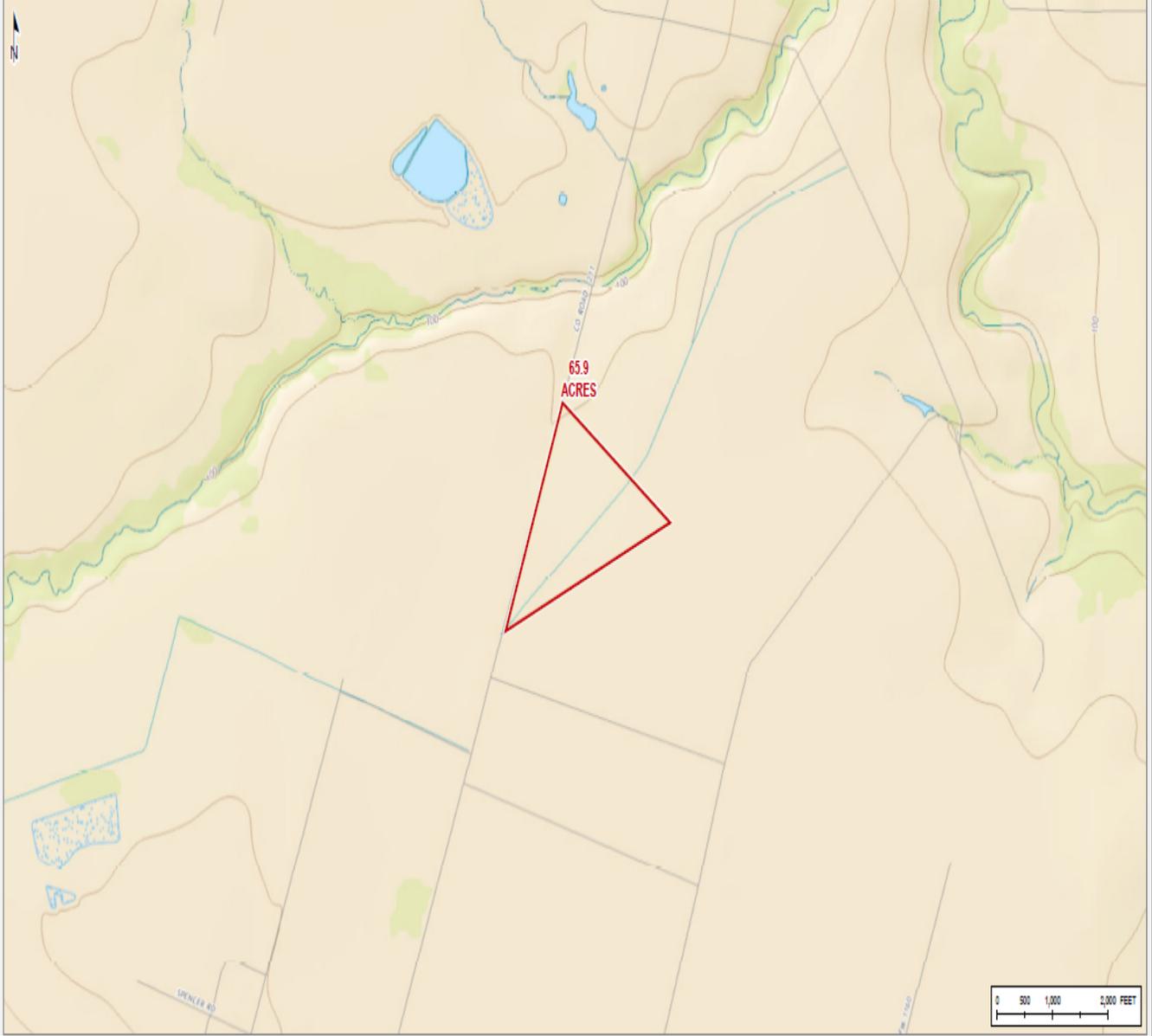
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TRANSCO GULF CONNECTOR EXPANSION

**APPENDIX A-4**  
**Site of Proposed Compressor Station 32**

TRANSCO GULF CONNECTOR EXPANSION PROJECT ENVIRONMENTAL SURVEY SITES - STATION 32



LEGEND

GULF CONNECTOR ENVIRONMENTAL SURVEY SITES

USGS Topographic Map Service:  
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DRAWING INFORMATION

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