Federal Energy Regulatory Commission
Office of Energy Projects, Division of Gas-Environment & Engineering

ENVIRONMENTAL ASSESSMENT REPORT

Name of Applicant: Natural Gas Pipeline Company of America, LLC

Date Filed: 8/1/2016	**Docket No:** CP16-488-000
Type: Section 7(b) and (c) – Construction and abandonment of facilities	**Cost:** $69,400,000

Facilities:

Natural Gas Pipeline Company of America, LLC (Natural) proposes to construct and operate a new 15,900 horsepower (hp) compressor station (Compressor Station 394) and an approximately 4,000-foot-long, 30-inch-diameter lateral in Cass County, Texas. In addition, Natural is requesting approval to abandon in place two 3,800 hp compressor units at its existing Compressor Station 301 located in Wharton County, Texas. This project is referred to as the Gulf Coast Expansion Project and would provide 460,000 dekatherms per day of long-term firm transportation service to two shippers that have subscribed to the capacity.

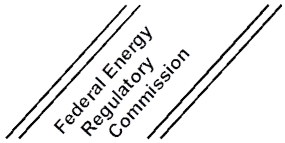
Environmental Impact -- Conclusions:

Categorical Exclusion	**Deficiency Letter Required**
Environment Not Involved	**EA/EIS Required**
X **Environment Complete**	**No NOI Required**
	NOI Required

Environmental Considerations or Comments:

An environmental assessment for the proposed facilities is attached.

Prepared by:	**Date:**	**Approved by Branch Chief:**	**Date:**
/s/Shahid M. Anis	4/21/2017	/s/ James Martin	4/21/2017



Office of

Energy Projects

April 2017

Natural Gas Pipeline Company of America, LLC **Docket No. CP16-488-000**

Gulf Coast Expansion Project

Environmental Assessment

Washington, DC 20426

GULF COAST EXPANSION PROJECT
ENVIRONMENTAL ASSESSMENT
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TECHNICAL ABBREVIATIONS AND ACRONYMS

ATWS	additional temporary workspace
BACT	best available control technology
BCC	Birds of Conservation Concern
CAA	Clean Air Act
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalents
CS	compressor station
Natural	Natural Gas Pipeline Company of America, LLC
Commission	Federal Energy Regulatory Commission
dBA	A-weighted decibel
DOT	U.S. Department of Transportation
Dth/d	dekatherms per day
EA	environmental assessment
ECMP	Environmental Compliance Management Plan
ECD	erosion control device
EI	environmental inspector
EPA	Environmental Protection Agency
EO	executive order
FERC	Federal Energy Regulatory Commission or Commission
FWS	U.S. Fish and Wildlife Service
FR	Federal Register
GHG	greenhouse gases
HAPs	hazardous air pollutants
Hp	horsepower
L_d	day sound level
L_{dn}	day-night sound level
L_{eq}	equivalent sound level
L_n	night sound level
MBTA	Migratory Bird Treaty Act
MMBtu/hr	million British thermal units per hour
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969 (as amended)
NESHAP	National Emission Standards for Hazardous Air Pollutants
NGA	Natural Gas Act
NOI	Notice of Intent
NO_x	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	noise sensitive area
NSR	new source review
O_3	ozone
OEP	Office of Energy Projects

PEM	palustrine emergent wetland
Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
Project	Gulf Coast Expansion Project
PSD	Prevention of Significant Deterioration
PSS	palustrine scrub-shrub wetlands
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPRP	Spill Prevention and Response Procedures
TCEQ	Texas Commission on Environmental Quality
TPWD	Texas Parks & Wildlife
TXDOT	Texas Department of Transportation
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compounds

SECTION A – PROPOSED ACTION

A.1 Introduction

On August 1, 2016, Natural Gas Pipeline Company of America LLC (Natural) filed an application with the Federal Energy Regulatory Commission (FERC or Commission) in Docket No. CP16-488-000 under Section 7(b) and (c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations. Natural seeks to obtain a Certificate of Public Convenience and Necessity (Certificate) to construct and operate the new 15,900 horsepower (hp) compressor station (CS 394) and an approximately 4,000-foot-long, 30-inch-diameter lateral connecting CS 394 to Natural's Amarillo to Gulf Coast Pipeline, all located in Cass County, Texas. In addition, Natural is requesting approval to abandon in-place two 3,800 hp compressor units at its existing Compressor Station 301 located in Wharton County, Texas. These facilities are collectively referred to as the Gulf Coast Expansion Project (Project).

We[1] prepared this environmental assessment (EA) in compliance with the requirements of the National Environmental Policy Act (NEPA); the Council on Environmental Quality's regulations for implementing the NEPA (Title 40 Code of Federal Regulations [CFR], Parts 1500-1508); and the Commission's regulations at 18 CFR 380. The EA is an integral part of the Commission's decision-making process whether to issue Natural a Certificate and authorization to construct, operate, and abandon 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 impacts; and
- facilitate public involvement in the environmental review process.

A.2 Purpose and Need

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

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

Section 7(b) of the NGA specifies that no Natural Gas Company shall abandon any portion of its facilities subject to the Commission's jurisdiction without the Commission first finding that the abandonment would not negatively affect the present or future public convenience and necessity.

Natural proposes to provide long-term firm transportation service to two shippers that have subscribed to the capacity created by the Project. The Project capacity is developed through the integration of existing capacity and expansion capacity of 240,000 dekatherms per day (Dth/d) which would enable Natural to transport 460,000 Dth/d of natural gas supplies to an existing delivery point and a new delivery point in the South Texas Gulf Coast area.

A.3 Proposed Facilities

The Project would consist of the following facilities:

- one new gas fired Compressor Station (CS 394) facility with approximately 15,900 hp and necessary auxiliary equipment, including piping facilities;
- pigging facilities and interconnection from CS 394 to the Amarillo to Gulf Coast Pipeline;
- construct approximately 4,000-foot-long new 30-inch-diameter pipeline lateral; and
- abandonment of two compressor units in place at Natural's existing Compressor Station (CS 301 – Units 5 &6), totaling approximately 5,600 hp.

Figure 1 illustrates the general location of the proposed facilities. Figure 2 indicates the site plan for CS 394 and shows the new 30-inch-diameter pipeline lateral. Figure 3 outlines the location of the existing CS 301.

A.4 Land Requirements

The total Project land requirement including both temporary and permanent impacts associated with pipeline right-of-way, additional temporary workspace (ATWS), aboveground facilities, and access roads would be approximately 39.9 acres. Permanent impact areas (27.3 acres) would include the new maintained pipeline right-of-way, the new CS 394 station and associated ancillary facilities, the Amarillo to Gulf Coast Pipeline Tie-in facility, and new permanent access roads. Temporarily affected areas (12.6 acres) primarily consist of those areas necessary to facilitate construction, including the construction right-of-way, ATWS, and temporary access roads. Following the completion of construction activities, areas temporarily affected would be restored to pre-construction conditions. Table 1 identifies the land requirements for the Project.

The abandoned units would be retired in place and involve minimal localized ground disturbance in previously disturbed areas to cut pipe and disconnect the abandoned units. Ground disturbance activities would occur entirely within previously disturbed upland areas of the existing compressor station yard.

Table 1- Land Requirements for the Project

Project Component	Land Affected during Construction (temporary & permanent) acres[1]	Land Affected During Operation (permanent) acres[2]
Pipeline Facilities		
Pipeline Lateral	8.4	4.6
ATWS[3]	1.5	0.00
Access Roads 2, 3, and 4	3.9	0.00
Pipeline Lateral Facilities Subtotal	13.8	4.6
Aboveground Facilities		
Compressor Station 394	21.5	21.5
Compressor Station 394 ATWS[4]	2.6	0.00
Tie-in- Facility ATWS[5]	0.3	0.3
Access Roads 1 and 5	0.9	0.9
Aboveground Facilities Subtotal	26.1	22.7
Project Total	**39.9**	**27.3**

[1] Land affected during construction is inclusive of operation impacts (permanent).
[2] Land affected during operation consists only of new permanent impacts.
[3] ATWS associated with temporary access roads 2-4 is captured in the overall pipeline lateral ATWS.
[4] ATWS associated with permanent access road 1 is captured in the overall Compressor Station 394 ATWS.
[5] ATWS associated with permanent access road 5 is captured in the overall A/G Tie-in facility ATWS.

Figure 1 – Gulf Coast Expansion Project – Vicinity Map

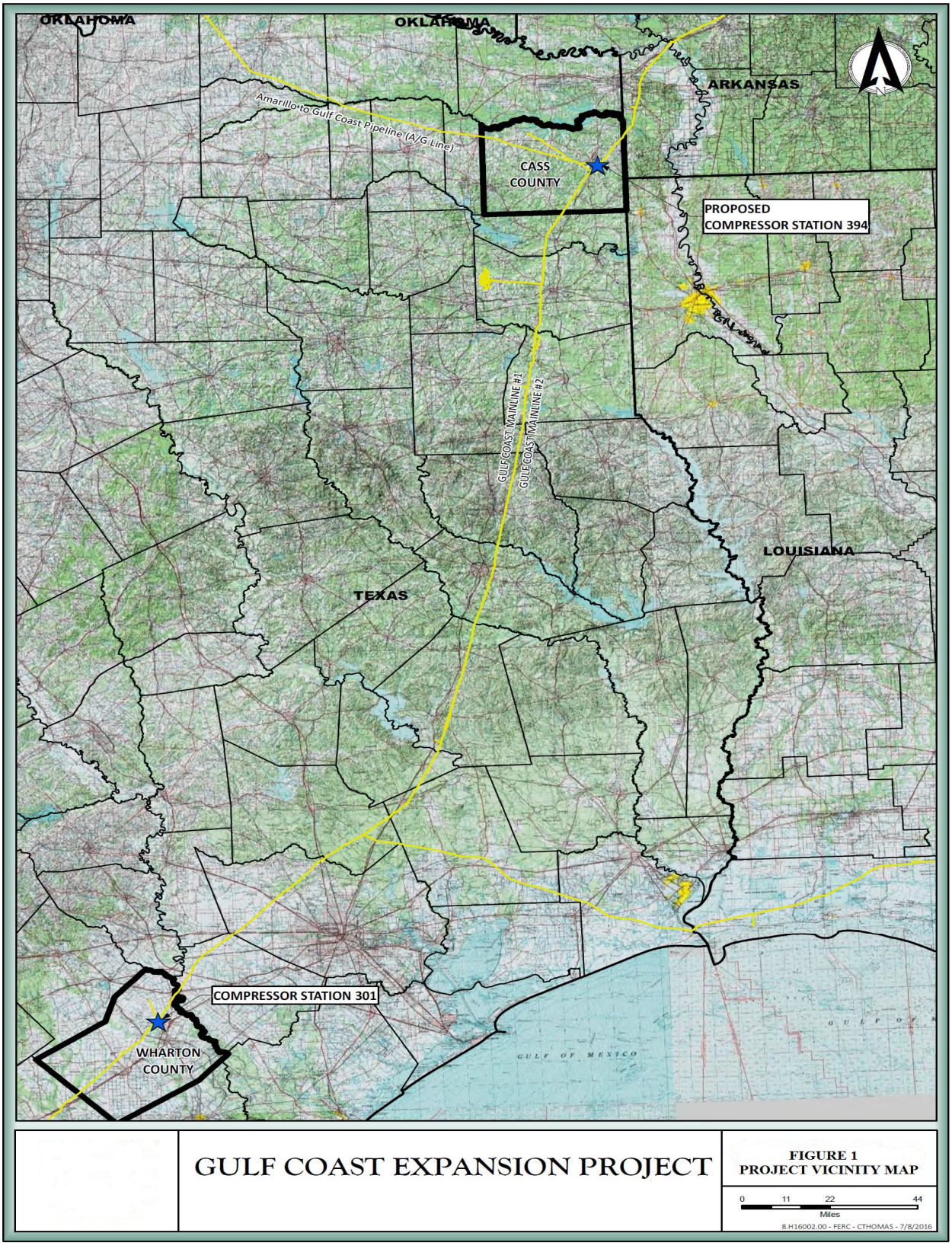


Figure 2 – Compressor Station 394 Site Map & 30" Pipeline Lateral

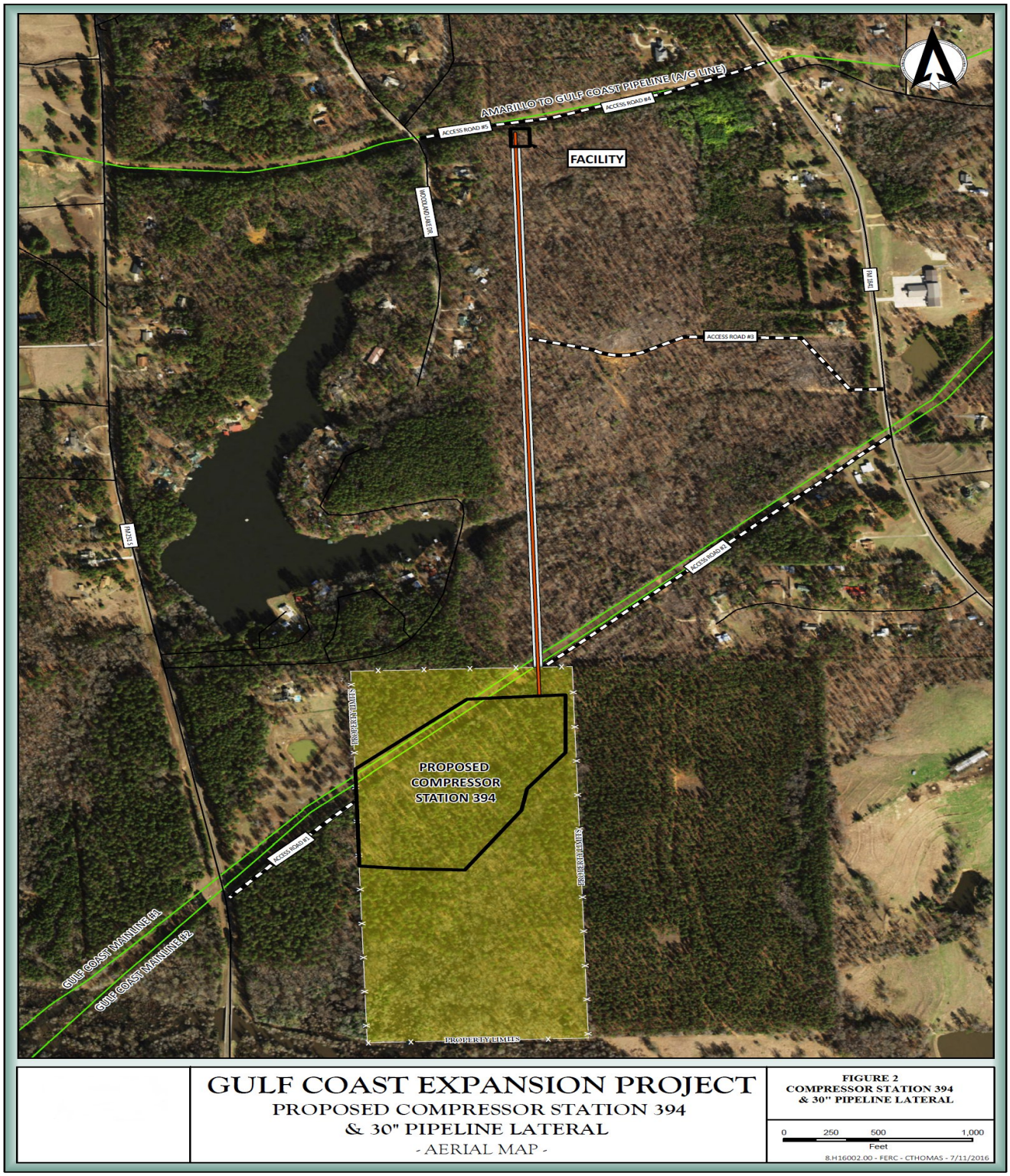


Figure 3 – Compressor Station 301 Abandonment of Units 5 and 6

A.5 Public Review and Comment

On September 14, 2016, the FERC issued a *Notice of Intent to Prepare an Environmental Assessment and Request for Comments on Environmental Issues for the proposed Gulf Coast Expansion Project* (NOI). The NOI was published in the Federal Register[2] and was mailed to interested parties including federal, state, and local officials; agency representatives; conservation organization; potentially interested Indian tribes; local libraries and affected landowners in the vicinity of the Project.

In response to our NOI, we received a comment letter on September 26, 2016, from United States Department of Homeland Security – Federal Emergency Management Agency Region VI Mitigation Division requesting that Communities' Floodplan Administrators' be contacted for the review and possible permit requirements for the Project, if federally funded in compliance with Executive Orders (EO) 11988 and 11990. The Project is not federally funded, therefore these EO's do not apply. In addition we received a comment letter from Texas Parks & Wildlife (TPWD) regarding Texas state listed threatened and endangered species; and fish and wildlife resources; the need for a revegetation plan; and invasive species. Further discussion and responses to the TPWD's comments is provided in Section B.3. In response to our NOI, the Bureau of Indian Affairs indicated it had no concerns with the Project. The Coushatta Tribe of Louisiana commented with a finding of "no historic properties affected, and requested to be notified in the event of unanticipated discoveries during construction. The Tonkawa Tribe of Oklahoma commented that it had no specifically designated historical or cultural sites in the Project area, but requested to be notified in the event of inadvertent discoveries during construction. The United Keetoowah Band of Cherokee Indians in Oklahoma commented that no historic properties would be affected by the Project, but requested to be notified of inadvertent discoveries during construction and also requested a cultural resources survey be conducted. Natural conducted the survey and provided the resulting report to the tribe. Natural's Plan for Unanticipated Discovery of Historic Properties or Human Remains During Construction, discussed in Section B.6 provides for notification of parties such as tribes.

A.6 Construction and Operational Procedures

The proposed facilities would be designed, constructed, tested, operated, and maintained to conform with or exceed federal, state, and local requirements, including the U.S. Department of Transportations (DOT's) Minimum Safety Standards in 49 Code of Federal Regulations (CFR) 192, "Transportation of Natural and Other Gas by Pipeline:

[2] 18 FR 64453 (September 20, 2016)

Minimum Federal Safety Standards", and 18 CFR 380.15, "Guidelines to be Followed by Natural Gas Pipeline Companies in the Planning, Clearing, and Maintenance of Right-of-Way and the Construction of Aboveground Facilities."

Natural would construct and abandon the Project facilities in accordance with FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) *and Wetland and Waterbody Construction and Mitigation Procedures* (Procedures) with some exceptions and incorporated them in Natural's Environmental Compliance Management Plan (ECMP). Eight exceptions to our Plan and Procedures were requested by Natural for site-specific reasons. FERC staff have reviewed and approved these exceptions and find them acceptable. Natural would implement equivalent effective compliance measures to minimize impacts to resources. Specific locations, justifications, and equivalent compliance measures are identified in Appendix A.

The Project ECMP also includes a Project-specific Spill Prevention and Response Procedures (SPRP), Plan for Unanticipated Discovery of Historic Properties or Human Remains During Construction, and other Project-specific plan. We have reviewed these plans, and find them acceptable.

The Project would be constructed via a combination of conventional and specialized construction procedures. Conventional open-cut pipeline construction techniques would be used for the majority of the pipeline lateral. Construction of the Project would consist of phased construction conducted in a sequential manner. The entire process would be coordinated in such a manner as to minimize the total time a tract of land is disturbed and therefore, exposed to erosion and/or temporarily precluded from its normal use.

Prior to initiating construction-related activities, Natural would secure right-of-way easements, or other required authorizations, from landowners whose properties would be crossed by the proposed pipeline lateral. Owners, tenants, and lessees of private land along the right-of-way would be notified in advance of construction activities that could affect their property, business, or operations.

Affected landowners would be notified prior to pre-construction staking, unless the landowner has previously requested otherwise. Following notification, a crew would stake the outside limits of the proposed construction right-of-way and ATWS, the centerline of the pipeline and drainages, highway crossing, and access roads. Following the establishment of workspace boundaries, the construction right-of-way would be cleared of vegetation and debris.

Trench spoil would be deposited adjacent to the trench within the construction work areas. In wetland areas, topsoil would be stockpiled separately per Natural's

ECMP. Natural would employ best management practices to minimize erosion during trenching operations and construction activities. Where necessary, temporary and permanent erosion control device (ECDs) would be installed and maintained to contain disturbed soils during trenching in uplands and to minimize potential erosion and sedimentation of wetlands and waterbodies.

Construction of CS 394 would begin with grading, leveling, and compacting the soils for the construction of required foundations. Building and equipment foundations would be installed and the Mars 100 Unit and associated equipment as well as any buildings, would be placed on the foundations. Pipe and other equipment would be assembled and welded on site. Aboveground and below ground piping would be installed at the station and would be hydrostatically tested prior to operation.

Following backfilling of the trench, the pipeline also be cleaned and hydrostatically tested to ensure that the system is free from leaks and is capable of operating at the design pressure.

Additionally, safety and control devices would be installed and tested prior to operation. Roads and parking areas would be constructed using gravel, asphalt, or concrete, as appropriate. Fencing would be constructed around the facility site. Once construction is complete, all disturbed areas not covered with gravel or asphalt would be graded, restored, and reseeded.

Construction of the tie-in facility would be conducted using the same general procedures as those described above for CS 394 and in accordance with the applicable federal and state regulations.

One temporary access road (Access Road 2) would occur in close proximity to residential areas; however, access to residences would not be impeded as a result of the construction activities.

The Project would require the crossing of Natural's two existing Gulf Coast Mainlines utilizing an open trench crossing method to lay the pipeline lateral below the two lines. Natural would maintain a minimum clearance of 18 inches between the existing pipelines and the proposed pipeline lateral wherever practicable.

Natural would assign an individual to perform the duties of Environmental Inspector (EI) to oversee and document environmental compliance and prepare the FERC weekly/biweekly reports throughout construction. All Project-related personnel would be informed of the EI's authority and would receive job-appropriate training prior to the beginning of work on the Project. Depending on the progress of construction, additional EIs may be added as necessary.

Natural proposes to abandon in place Compressor Units 5 and 6 both of which are rated at 2,800 hp at its existing CS 301. These units have not operated since 2006. The abandoned units would involve minimal localized ground disturbance in previously disturbed areas. The scope of work would consist of cutting pipe and disconnecting the abandoned units. Ground disturbance activities would occur entirely within previously disturbed upland areas of the existing compressor station yard.

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

A.7 Construction Schedule

Natural anticipates mobilization, clearing, and construction of the Project facilities to begin in the fourth quarter of 2017 in order to meet an in-service date of October 2018. Construction would be implemented in phases, form initial surveying and clearing to backfilling and finish grading. Construction duration of the pipeline lateral, CS 394, tie-in facility, and abandoned units at CS 301 would be completed within 12 months.

A.8 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. Non-jurisdictional facilities are those facilities that are related to or support and include facilities to be built and owned by other companies that are not subject to FERC jurisdiction.

Non-jurisdictional facilities associated with the Project include the addition of a new power line and new water well to service CS 394. The approximately 960-foot-long power line would originate from an existing domestic powerline drop along local road FM 251. The powerline would be installed adjacent to permanent Access Road 1 and terminate at an electrical substation within CS 394. The new water well would be on the CS 394 site. The power line and well water are part of private construction projects under state and local jurisdiction, and it is anticipated that the provider would obtain all necessary federal permits and approvals prior to construction of the non-jurisdictional facilities. The tie-in facility would require moderate power to operate the flow and pressure controls. Power would be provided through an existing domestic powerline located north of the adjacent pipeline corridor. These actions are not under the Commission's jurisdiction; however, in the EA we are providing information about these non-jurisdictional facilities with the cumulative impacts analysis in section B.9.

A.9 Permits and Approvals

Natural would obtain all necessary permits, licenses, clearances, and approvals related to construction and operation of the Project. Natural would provide all relevant permits and approvals to the contractor, who would be required to adhere to applicable conditions. Table 2 identifies all the federal, state, and local permits, authorizations, or clearances, as applicable, for construction of the Project.

Table 2 - Applicable Major Permits, Licenses, Authorizations, and Clearances for the Project

Permit/Clearance/Approval	Agency	Submittal/Receipt
Federal		
Certificate of Public Convenience and Necessity	Federal Energy Regulatory Commission	Application filed August 1, 2016
Section 404 Permit: Nationwide Permit No. 12	U.S. Army Corps of Engineers – Fort Worth Districts	Authorized without pre-construction notification – August 30, 2016
Endangered Species Act, Section 7 Consultation	U.S. Fish and Wildlife Service ("USFWS")– Arlington Ecological Field Office	CS 394 concurrence received – July 29, 2016
	USFWS – Clear Lake Ecological Field Office	CS 301 Further coordination is not necessary due to no effect determination for federally listed species and critical habitat, as indicated in a letter issued by USFWS in February 2012.
Bald and Golden Eagle Protection Act, *Migratory Bird Treaty Act*	USFWS – Arlington Ecological Field Office	Mitigation measures approved – November 15, 2016
State		
Clean Water Act Section 401 Water Quality Certification	Texas Railroad Commission	Automatic with Nationwide 12 Permit Authorization
Hydrostatic Test Water Discharge permit		Anticipated submittal 2nd Quarter 2018
Air Permit-by-Rule	Texas Commission on Environmental Quality	Permit 141869 issued – September 29, 2016
State Threatened and Endangered Species Consultation	Texas Parks and Wildlife Department	Recommendations provided – August 3, 2016.
National Historic Preservation Act Section 106 Consultation	Texas Historical Commission	CS 394 Concurrence received – July 5, 2016
		CS 301 abandonment activities at CS 301 would be conducted in accordance with Natural's Blanket Clearance Agreement issued on December 22, 2014.

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 to five years. Long-term impacts would eventually recover, but require more than five years. Permanent impacts are defined as lasting throughout the life of the Project.

Natural proposes to abandon in place two 2,800 hp compressor units (units 5 and 6) for a total of 5,600 hp at Natural's existing CS 301. This proposal would result in a total reduction of 5,600 hp at CS 301. As a result of its integrity management program, Natural would have been required to modify units 5 and 6 to meet current emission standards. Given the current demand on its systems, other integrity-related facility upgrades, and the costs associated with meeting the current emission standards required for units 5 and 6, Natural determined that the abandonment of these two existing units at CS 301 is appropriate. In addition these units have not operated since 2006.

The abandonment activities at CS 301 would take place entirely within existing, developed facilities. The abandoned units would involve minimal localized ground disturbance in previously disturbed areas to cut pipe and disconnect the abandoned units. Ground disturbance activities would occur entirely within previously disturbed upland areas of the existing compressor station yard.

Therefore, this EA does not address further the abandonment of the retired units, as they would neither affect nor have conflict with:

- groundwater (abandonment activities would not impact groundwater since ground disturbance activities would be minimal and occur within previously disturbed upland areas);
- cultural resources (abandonment activities would occur within previously disturbed areas of the existing compressor station yard);
- geology and soils (abandonment activities would not impact geology and soils ground disturbance activities would be minimal and occur within previously disturbed upland areas);
- residential areas (located in a very sparsely populated, rural area within existing compressor station yard);
- wetlands (no wetlands on the CS 301 site);
- visual resources (no visual impact as a result of the abandonment units since all abandonment activities are within the boundary of the existing CS 301; and

- air quality and noise (units have not operated since 2006, therefore operational air quality and noise impacts after the abandonment would be negligible).

B.1 Geology

B.1.1 Geologic Setting

The Project is located within the West Gulf Coastal Plain section of the Coastal Plain Physiographic Province. The West Gulf Coastal Plain section consists of late Cretaceous Period to Holocene Epoch deposits that were formed in a mostly marine environment 135 million years ago, were later uplifted, and now tilt seaward. Deposits are characterized as unconsolidated to semi-consolidated sands, silts, and clays. The West Gulf Coastal Plain of Texas is divided into three subsections. The Project is located in the Interior Coastal Plains subsection. The Interior Coastal Plains subregion consists of alternating belts of resistant, uncemented sands among weaker shales that erode into long, sandy ridges.

B.1.2 Mineral Resources

According to the Railroad Commission of Texas (RRC), historic coal mines, as well as active coal mines, are not present within 1 mile of the proposed Project facilities. Therefore, the Project would not impact any historic or active coal mines. One oil/gas well is located within 0.25 mile of the Project; however, the permit for this well is listed as canceled or expired. Due to the inactive status and distance of this well from the Project area, impacts on oil/gas wells are not anticipated to occur as a result of construction or operation of the Project facilities.

B.1.3 Geologic Hazards

Geologic hazards are naturally occurring physical conditions that are capable of producing property damage and loss of life. Seismic hazards include earthquakes, surface faulting, and soil liquefaction. According to the United States Geological Survey (USGS) Seismic Hazards maps for the U.S., the Project is situated in an area of low to moderate seismic probability. The USGS rates peak ground acceleration and probabilities as part of its Earthquake Hazards Program. Peak ground acceleration is the maximum acceleration experienced during the course of an earthquake and is measured in units of acceleration due to gravity. Damage to buildings and other structures is not likely to occur at ground accelerations of less than 10 percent gravity. Based on historic seismic activity in the area, the USGS estimates that an earthquake with a 10 percent probability of occurring within any 50-year interval would result in peak ground accelerations of 2 to 4 percent gravity and an earthquake with a 2 percent probability of

occurring within any 50-year interval would result in peak ground accelerations of 4 to 6 percent gravity.

A review of the USGS Quaternary Fault and Fold Database identified no faults or associated folds that are thought to be the result of large earthquakes in the last 1.6 million years in the Project area.

The above discussion on seismic hazards considers only natural seismic events. The USGS has recently compiled data to identify and determine the potential hazard of induced earthquakes, which are those that result from human activity, most commonly the disposal of wastewater from oil and gas production through its injection in deep underground wells. The USGS study resulted in a forecast for damage from natural and induced earthquakes. The chance of damage from an earthquake in the Northeast Texas area, including the CS 394 site, for 2016 is less than 1 percent.

The Project does not occur in any areas prone to flash flooding, but is located approximately 150 feet from a large waterbody, Fin and Feather Club Lake. However, this waterbody is not listed as an area prone to flash flooding by the Federal Emergency Management Agency; therefore, no impacts on the Project facilities are anticipated to occur from flash floods.

B.1.4 Blasting

The Project area is characterized by soils with potentially shallow depth to bedrock (bedrock less than 5 feet); however, blasting is not anticipated. In the event that shallow bedrock is encountered during construction, the technique used for bedrock removal would depend on factors such as strength and hardness of the rock. If consolidated rock is encountered during construction, Natural would fracture and excavate the bedrock using standard construction equipment. Blasting of bedrock would only be required as a last resort if hard bedrock is encountered that is not easily removed by conventional excavation methods. Should Natural determine that blasting is required; Natural would submit a Blasting Plan to FERC for review and approval prior to the commencement of any blasting activities.

B.1.5 Paleontological Resources

In the unlikely event that paleontological resources are discovered during construction in the proposed Project area, Natural would notify the state geological survey or natural history museum, as well as FERC, so that all finds may be properly documented. Due to the Project being located in an area of low to moderate seismic probability, outside of an area prone to flooding, and in an area with minimal impact to geologic resources, we conclude that the impacts on geology would not be significant.

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) Soil Resource.

Ground disturbing activities for the Project are wholly located within Cass County in northeastern Texas and cross seven soil map units. Descriptions regarding the general characteristics of each soils series within the Project area are presented below.

B.2.1 Existing Soil Characteristics and Limitations

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.

A total of 0.13 mile, or approximately 17 percent, of the soils crossed by the proposed pipeline lateral are considered to be prime farmland; however, these areas are not actively cultivated. No prime farmland soils are located within Compressor Station 394 or the tie-in facility.

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 Natural Resources Conservation Service (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. Appendix B provides the soils erosion potential within the Project area.

Clearing, grading, trenching, backfilling and equipment movement has the potential to accelerate the erosion process and, without adequate protection, result in discharge of sediment to waterbodies and wetlands. Natural would adhere to the ECMP, which details construction and restoration measures for upland, adjacent waterbody and wetland areas, in order to minimize impacts on soil resources.

Temporary erosion controls, such as interceptor diversions and sediment filter devices (including, but not limited to hay/straw bales and silt fences), would be installed after initial disturbance of the soils, where necessary to minimize erosion, and would be maintained throughout construction. As required, temporary trench breakers would be installed immediately following trench excavation. Temporary ECDs would be inspected on a regular basis. During construction, the effectiveness of temporary ECDs would be monitored by Natural's EI.

In order to minimize the potential for erosion, Natural may install permanent ECDs, such as permanent slope breakers, riprap, or rock outlet protection, in addition to performing regular restoration and revegetation activities. Permanent ECDs would be installed in accordance with revegetation measures outlined in the ECMP, applicable federal and state regulations, and specific landowner requests. Temporary ECDs would be maintained until the Project area has been successfully revegetated. Following successful revegetation of construction areas, the temporary ECDs would be removed. The effectiveness of revegetation and permanent ECDs would be monitored by Natural's operating personnel during the long-term operation and maintenance of the Project facilities.

B.2.2 Revegetation

All of the soils affected by the Project have moderate to high revegetation potentials. Additional information regarding revegetation potential for each soil map unit crossed by the Project pipeline lateral is provided in Appendix B.

Successful restoration and revegetation of the Project workspaces are important for maintaining productivity and protecting the underlying soil from potential damage. Fertility and erosion are generally the two main factors that would limit the regrowth of vegetation, but these can be mitigated through the application of fertilizers and/or seeding nets. Restoration and revegetation growth specifications would follow the measures outlined in the ECMP.

Natural would implement several management strategies to minimize the spread of exotic and invasive plant species following construction. Management and control measures such as minimizing the time in which bare soil is exposed and monitoring to verify invasives are not becoming established would be used.

Natural would apply soil amendments as needed in areas with low to moderate revegetation potential in order to create a favorable environment for the re-establishment of vegetation. Natural has reviewed documents and guidance specific to Texas to obtain recommendations for seed mixtures and soil amendments to be used during restoration of disturbed areas following construction activities. Following the completion of construction activities, disturbed areas would be reseeded in accordance with Natural's ECMP, and utilizing species recommended by the local NRCS office. Revegetation would be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands.

B.2.3 Rocky Soils and Shallow Bedrock Soils

Introducing stones or rocks to surface layers may reduce the capacity of the soil to retain moisture, resulting in a reduction of soil productivity. Additionally, areas with shallow depth to bedrock (less than 5 feet) are identified as areas that have potential to introduce rock to topsoil. Approximately 80 percent of the soils crossed by the proposed pipeline lateral are characterized by shallow bedrock. Two of these soils with shallow bedrock along the pipeline lateral have rock fragments greater than 3 inches, as indicated in Appendix B. There is potential to introduce subsurface stone and rock into surface soils during construction in this area; however, due to the short distance of the Project within these soils, and given that stones and rock fragments are likely already present at the surface, it is not anticipated that construction of the Project through these areas would change the soil composition.

B.2.4 Shrink-Swell Soils

Soil expansion occurs when soils consisting primarily of clay and silt expand as a result of increased moisture content, and shrink upon drying. Expansion and shrinking of soils due to moisture fluctuations can cause damage to concrete slabs, foundations, and other confining structures. Shrink-swell potential is the relative change in volume to be expected with changes in moisture content, measured as the linear extensibility percent. Based on the Soil Survey of Marion and Cass Counties, Texas, all of the soils in identified for the aboveground facilities (Project facilities with foundations that could be affected by expansive soils) have a moderate shrink-swell potential.

Shrink-swell soils are only a concern where there are building foundations. As indicated in Appendix B, the soil map units at the aboveground facility sites (Cuthbert fine sandy loam, Cuthbert gravelly fine sandy loam, and Kirvin gravelly fine sandy loam) are characterized by moderate shrink-swell potential, construction on shrink-swell soils requires special design and/or construction techniques or maintenance to mitigate for potential damage to foundations, the most basic of which is proper drainage. Natural

would develop a Drainage Plan, which would ensure proper drainage of the site to assist in the minimization of "swell" of soils following a rain event. Additionally, Natural would construct the aboveground facilities in accordance with all applicable federal, state, and local building codes and standards.

B.2.5 Inadvertent Spills or Discovery of Contaminants

The U.S. Environmental Protection Agency's NEPAssist online database for hazardous waste, water discharges, toxic releases, superfund and brownfield sites, as well as the Texas Commission on Environmental Quality's list of superfund sites indicate no contaminated sites located within 0.5 mile of the Project.

During construction, contamination from accidental spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely impact soils. In the event of a spill, Natural would implement the ECMP which specifies cleanup procedures in the event of soil contamination from spills or leaks of fuel, lubricants, coolants, or solvents. Natural and its contractors would implement the ECMP to prevent and contain accidental spills of any material that may contaminate soils. If necessary, additional measures would be implemented to ensure that inadvertent spills of fuels, lubricants, or coolants, are contained, cleaned up, and disposed of in an appropriate manner.

In the event that contaminated media is discovered during construction, Natural would adhere to the Plan for Unanticipated Discovery of Contaminated Soils or Groundwater, which is provided in the ECMP and outlines the steps to be followed in the event that contaminated sediments or soils, as identified by evidence of subsoil discoloration, odor, sheen, or other such indicators, are encountered during construction.

The use of the ECMP and ECDs would minimize erosion related to the Project. Therefore, effects on soils, erosion, and vegetation would be minor and not significant.

B.3 Water Resources and Wetlands

B.3.1 Groundwater

Existing Resources

The construction portion of the Project is underlain by the Texas Coastal Uplands aquifer system major aquifer and the Queen City minor aquifer. The Texas Coastal Uplands aquifer system is related and connected to the Mississippi Embayment aquifer system and consists of sand, silt, and clay deposits from the Claiborne Group and the Wilcox Group. This aquifer system spans across 70 counties in Texas and is subdivided into four aquifers that show similar hydraulic characteristics (USGS, 2009). This system

is recharged primarily through precipitation and infiltration. The southern portion of the aquifer is overdeveloped which has caused highly mineralized water to enter wells and the water level to drop by up to 300 feet. The water within the system is used mostly for agricultural, for the public, and for industrial needs.

The Queen City aquifer is a minor aquifer that spans from northern Texas through central Texas. This aquifer is composed of sediments of the Queen City Formation's sand, sandstone, and clay layers and the thickness ranges from 500 feet up to 2,000 feet. Excessive iron concentrations and high acidity can be found in the northeastern portion of the aquifer and salinity decreases from south to north. The Project is located in an outcrop area of this aquifer.

According to the USEPA, the Project is not underlain by a sole-source aquifer (USEPA 2015a). In addition, the Texas Commission on Enviornmental Quality (TCEQ) indicates that no source water protection areas are located in the Project area (TCEQ, 2016a; Ables, 2016).

Public and Private Water Supply Wells and Springs

Based on surveys conducted by Natural in the spring of 2016 and other available data, no springs are located within one mile of the Project area (Texas Parks and Wildlife Department [TPWD], 2016). No private wells are located within 150 feet of the Project area (Texas Water Development Board [TWDB], 2016b).

Natural would install one groundwater well at CS 394. This well would be utilized during the operation of the facility. Natural anticipates that approximately 25,000 gallons would be withdrawn annually for sanitary as well as for occasional maintenance/housekeeping uses. The total water use for Cass County in 2015 was estimated to be 2.5 billion gallons of which 439 million were sourced from groundwater (TWDB, 2016a). As such the volume of water proposed to be used for the project would be 0.006 percent of the total amount of groundwater used in the county. Based on these calculations, adverse groundwater supply impacts are not anticipated.

Contaminated Groundwater

Based on a review of TCEQ data, the Project facilities would not cross or disturb any sites of known groundwater contamination or leaking underground storage tanks (TCEQ, 2016d; Allen, 2016). If contaminated groundwater would be encountered during construction activities, Natural would implement measures in its SPRP which is included in its ECMP.

Impacts and Mitigation

Due to the limited scope and duration of Project activities overlying aquifers and Natural's efforts to minimize the potential for groundwater contamination through the ECMP, the Project is not likely to impact regional aquifer systems. The addition of a water well at the proposed CS 394 would not impact groundwater resources because withdrawal rates would be consistent with or lower than a residential supply well.

Water needed during construction for dust control, concrete mixing, and hydrostatic testing (approximately 211,465 gallons) would be obtained from a municipal source as well as from the groundwater well installed at CS 394. No chemicals would be added to the hydrostatic test water. Upon completion of testing, water would be discharged into a well vegetated upland area. Impacts would be mitigated with the implementation of best management practices as stated in the ECMP. Natural would comply with all permit conditions of the RRC for hydrostatic test water discharge.

Clearing and right-of-way grading would involve the removal of vegetation that would serve as a filter during water infiltration and the recharge of shallow aquifers. Natural would only clear vegetation where necessary. In addition vegetation in temporary work areas would be allowed to regenerate following construction in accordance with Natural's ECMP.

As trenches are dug to approximately 7 feet, they could temporarily impact shallow groundwater. Natural would limit the amount of time trenches are left open in order for local water tables to return to their original elevations as quickly as possible.

Spills or leaks of hazardous materials could result in long-term impacts on groundwater resources. Natural would implement measures outlined in its ECMP which includes storing any potential contaminants greater than 100 feet from wetlands and waterbodies. Natural would also prohibit refueling activities and storage of hazardous liquids within at least a 200-foot radius of all private wells and at least a 400-foot radius of all municipal or community well supplies.

Natural would provide a temporary water source to affected individuals should a previously unidentified water well or buried water line be damaged during construction activities. In the event that a water system would need to be repaired, Natural would obtain water from another municipal water source.

All Project components would be constructed in accordance with applicable government regulations, permits, and approvals and construction methods would be consistent with industry-recognized best management practices. Based on Natural's proposed minimization measures, acquisition of the appropriate local permits, and

implementation and compliance with its ECMP, we find that the Project would not result in any significant long-term or permanent impacts on groundwater resources or users of groundwater in the Project area.

B.3.2 Hydrostatic Test Water

Testing of all newly constructed pipeline components at the Project sites is required by the DOT (49 CFR § 192). After cleaning, the pipeline components would be tested in accordance with DOT standards to verify integrity and to ensure its ability to withstand the designed maximum operating pressures. Pipeline integrity is tested by capping the pipeline segments with test manifolds and filling the capped segments with water. Natural would obtain hydrostatic test water from municipal supplies trucked into the Project area and from the well at CS 394. The water would then be pumped into the test section behind a fill pig. Then, a high-pressure pump would be used to pressurize the test section to the designed test pressure. As mentioned above test water would contact only new pipe and no additives would contaminate the test water.

Natural estimates that a total of approximately 211,465 gallons of water would be needed to complete the hydrostatic pressure testing. As mentioned above Natural would follow its ECMP and applicable state discharge permits during hydrostatic testing and discharge. After hydrostatic testing is complete, the water would be discharged into either a frac tank and hauled to a separate authorized disposal location or discharged into a well-vegetated upland area within or adjacent to the existing facility. Discharge waters would be dispersed by an energy-dissipating device to minimize erosion and sedimentation, and provide additional filtering.

B.3.3 Surface Water Resources

Existing Resources

The TCEQ designates areas of primary influence for public water supplies. These are areas within 1,000 feet from the 3-mile-long stream reach upstream of a public water supply. No areas of primary influence are located in the Project area (TCEQ 2016e). In addition no surface water intakes for public water systems are located within three miles of the Project (TCEQ 2016b).

Natural identified eight waterbody crossings associated with the Project activities at CS 394. These waterbodies are identified in Appendix C. All of these waterbodies were identified as minor, ephemeral, unnamed tributaries of Fin and Feather Lake Club and Black Bayou.

Impacts and Mitigation

Impacts to surface waterbodies may occur due to in-stream construction or construction along the banks and slopes of adjacent waterbodies. These impacts include the modification of habitat, increased sedimentation and turbidity, decreased dissolved oxygen concentrations, the inadvertent release of chemical and nutrient pollutants from sediments, and the introduction of chemical contaminants.

Natural would conduct all stream crossings during low-flow periods to minimize these impacts. Approximately 979 feet of three ephemeral streams would be permanently filled to bring CS 394 to grade. A fourth would have a permanent culvert installed for Permanent Access Road 5. The filling of these waterbodies are required to meet safety and constructability standards. To fill these streams, clean fill would be brought in from an offsite source. The three waterbodies proposed to be permanently filled (SP1CA006, SP1CA005, and SP1CA001) only flow water for a brief time following a rainfall. To maintain site hydrology and to avoid impacts to the sub-basin, Northern would design the site drainage at CS 394 using standard drainage and erosion control measures.

Natural would also discharge any water pumped out of tranches through hay/straw bale structures and/or filter bags to reduce the water of water blow and to prevent scouring from runoff.

Because all affected streams are ephemeral and Natural would manage the minor storm flow currently conveyed by these streams, impacts on waterbodies would be minor. In addition, Natural would implement a variety of measures to minimize impacts on aquatic habitats and water quality, including the implementation of Natural's ECMP and SPRP. Therefore, through implementation of these measures, we conclude that impacts on aquatic resources and water quality, would be minor and temporary.

B.3.4 Wetland Resources

Existing Resources

Natural identified potential wetland areas by reviewing National Wetlands Inventory (NWI) maps and completed field delineation surveys in the spring of 2016. Natural completed these surveys using United States Army Corps of Engineers' (USACE) 1987 *Federal Manual for Identifying and Delineating Jurisdictional Wetlands* (USACE, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (Version 2.0) (USACE, 2010). Wetlands were classified as described in Cowardin et al., (1979). Two wetland types were identified in the Project work areas: palustrine emergent wetlands (PEM) and palustrine scrub-shrub wetlands (PSS). The wetlands crossed by the Project are presented in table 3 below.

A total of three PEM wetlands occur within the Project footprint. Dominant vegetation observed within the PEM wetlands included sand spikerush (*Eleocharis montevidensis*), common rush (*Juncus effusus*), sweetgum (*Liquidambar styraciflua*), cypress swamp sedge (*Carex joorii*), sensitive fern (*Onoclea sensibilis*), anglestem beaksedge (*Rhynchospora caduca*), tapered rosette grass (*Dichanthelium acuminatum*), roundhead rush (*Juncus validus*), woolgrass (*Scirpus cyperinus*), roundleaf greenbrier (*Smilax rotundifolia*), slender woodoats (*Chasmanthium laxum*), silver plumegrass (*Saccharum alopecuroides*), royal fern (*Osmunda regalis*), lizard's tail (*Saururus cernuus*), American hornbeam (*Carpinus caroliniana*), and swamp smartweed (*Polygonum hydropiperoides*).

One PSS wetland would be affected by the construction of the pipeline lateral. Dominant vegeatation in this PSS wetland includes sweetgum, American hornbeam, cypress swamp sedge, saw greenbrier (*Smilax bona-nox*), sweet bay magnolia (*Magnolia virginiana),* slender woodoats, woolgrass, common buttonbush (*Cephalanthus occidentalis*), hazel alder (*Alnus serrullata*), common rush, and sand spikerush.

Impacts and Mitigation

Construction impacts on wetlands would be limited to only 0.17 acre. Wetland crossings would be conducted consistent with minimization, protection, and restoration requirements within the ECMP. As such, Natural has narrowed the construction right-of-way to 75 feet in wetlands. The construction of the aboveground facilities would not result in temporary construction or permanent operational impacts on wetlands. Project access roads would result in a total of 0.07 acre of temporary construction impacts. The Project would also not impact any NRCS Wetland Reserve Program easements (NRCS, 2016; Stone 2016).

Restoration would be completed in accordance with the ECMP. Following restoration, revegetation of wetlands would be monitored periodically for the first three years following construction. If after three years revegetation is not successful, a remedial revegetation plan would be developed and implemented by Natural.

In addition to the direct impacts, wetland resources could be affected by accidental spills and erosion and sedimentation from ground-disturbing activities. Natural would minimize these impacts by adhering to their ECMP, which includes a SPRP. In consideration of the small area affected and the measures to minimize impacts and restore affected wetlands, we find that wetland impacts associated with the construction and operation of the Project would be minor.

Table 3 - Wetland Resources Crossed or Otherwise Affected by the Gulf Coast Expansion Project

Feature ID	Approximate Milepost / Facility	Hydrologic Unit Code (8 digit)	Wetland Type [a]	Proposed Crossing Method	Approximate Pipeline Crossing Length (feet)	Temporary Impacts (acres)	30-foot Corridor Operational Impacts (acres)[b]
WP1CA002_PSS	0.24	11140304	PSS	Open-cut	78	0.09	0.02
WP1CA002_PEM_D	0.26	11140304	PEM	Workspace Only	N/A	0.01	0.00
	Pipeline Lateral Subtotal				*78*	*0.10*	0.02
WP1CA005	Access Road 3	11140304	PEM	Timber Matting	N/A	0.05	0.00
WP1CA006	Permanent Access Road 5 ATWS	11140304	PEM	Timber Matting	N/A	0.02	0.00
	Access Roads Subtotal				*N/A*	*0.07*	0.00
	PROJECT TOTAL				**78**	**0.17**	**0.02**

[a] Cowardin Wetland Types: PEM - palustrine emergent; PSS - palustrine scrub-shrub; PFO - palustrine forested

[b] Operational impacts in this column are based on a 10-foot-wide operation impact on PSS wetlands that would be converted to herbaceous wetlands due to pipeline maintenance. Operation impacts on PFO wetlands in this column reflect potential for selective thinning of trees within 15 feet of the pipeline that have roots that could compromise the integrity of the pipeline coating. The 30-foot corridor includes the impacts associated with the 10-foot corridor operational impacts.

B.4 Vegetation, Wildlife, Fisheries, and Threatened and Endangered Species

B.4.1 Vegetation

The vegetation and land cover types affected by the construction and operation of the portion of the Project at CS 394 and the associated pipeline consist of the following:

- Open land (maintained right-of-way and recently clear-cut for timber harvest): Dominant vegetation within the open land in the Project area consists of bahiagrass (*Paspalum notatum*), wooly croton (*Croton capitatus*), broomsedge bluestem, (Andropogon virginicus), tapered rosette grass, (Dichanthelium acuminatum), roundhead rush (*Juncus validus*), Carolina geranium (*Geranium carolinianum*), black medick (*Medicago lupulina*), meadow fescue (*Festuca pratensis*), Johnsongrass (*Sorghum halepense*), little bluestem (*Schizachyrium scoparium*), and dogfennel (*Eupatorium capillifolium*).

- Forest: Forest within the Project area consists primarily of mixed hardwood-pine forest, the majority of which has been selectively harvested for pine in recent years as is evidenced by an early successional understory. Dominant vegetation within forested areas consists of red maple (*Acer rubrum*), loblolly pine, American elm (*Ulmus americana*), American holly (*Ilex opaca*), laurel greenbrier (*Smilax laurifolia*), saw greenbrier, blackjack oak (*Quercus marilandica*), post oak, white oak, water oak (*Quercus nigra*), laurel oak (*Quercus laurifolia*), cedar elm (*Ulmus crassifolia*), eastern redcedar (*Juniperus virginiana*), yaupon holly (*Ilex vomitoria*), turkey oak (*Quercus laevis*), muscadine grape (*Vitis rotundifolia*), farkleberry (*Vaccinium arboreum*), American beech (*Fagus grandifolia*), sweetgum, white ash (*Fraxinus americana*), sweetbay magnolia, broomsedge bluestem, tapered rosette grass, American beautyberry (*Callicarpa americana*), cinnamon fern (*Osmundastrum cinnamomeum*), Alabama supplejack (*Berchemia scandens*) and slender woodoats (*Chasmanthium laxum*).

- Wetland Vegetation: Common wetland vegetation was previously described in Section B.3.
- Developed land: Developed land in the Project area consists of road easements. Dominant vegetation observed along road easements in the Project area consists of bahiagrass, broomsedge bluestem, black medic, and Carolina geranium.

The impacts on each vegetation community are depicted in table 4 below.

Table 4- Summary of Habitat Impacts (acres)										
Facility	**Open Land**		**Forest**		**Wetland**		**Developed**		**Project Total**	
	Const. [a]	**Op. [b]**	**Const. [a]**	**Op. [b]**	**Const. [a]**	**Op. [b, c]**	**Const. [a]**	**Op. [b]**	**Const. [a]**	**Op. [b]**
Pipeline Facilities										
Pipeline Lateral	0.55	0.42	7.7	4.0	0.10	0.02	0.00	0.00	8.4	4.6
ATWS [d]	0.53	0.00	0.90	0.00	0.00	0.00	0.05	0.00	1.5	0.00
Access Roads 2, 3, and 4	3.7	0.00	0.08	0.00	0.05	0.00	0.08	0.00	3.9	0.00
Pipeline Facilities	*4.8*	*0.42*	*8.7*	*4.0*	*0.15*	*0.02*	*0.13*	*0.00*	*13.8*	*4.6*
Aboveground Facilities										
Compressor Station 394	21.4	21.4	0.08	0.08	0.00	0.00	0.00	0.00	21.5	21.5
Compressor Station 394 ATWS [e]	2.4	0.00	0.20	0.00	0.00	0.00	0.01	0.00	2.6	0.00
Tie-in Facility	0.00	0.00	0.29	0.29	0.00	0.00	0.00	0.00	0.29	0.29
Tie-in Facility ATWS [f]	0.43	0.00	0.38	0.00	0.02	0.00	0.01	0.00	0.84	0.00
Access Roads 1 and 5	0.89	0.89	0.00	0.00	0.00	0.00	0.02	0.02	0.91	0.91
Aboveground Facilities	*25.1*	*22.3*	*0.95*	*0.37*	*0.02*	*0.00*	*0.04*	*0.02*	*26.1*	*22.7*
PROJECT TOTAL	**29.9**	**22.8**	**9.6**	**4.4**	**0.17**	**0.02**	**0.17**	**0.02**	**39.9**	**27.3**

[a] Land affected during construction is inclusive of operation impacts (permanent).
[b] Land affected during operation consists only of new permanent impacts.
[c] Operational land use impacts associated with wetlands have been calculated based on the proposed 50-foot–wide permanent easement. Per the ECMP, Natural would maintain a 10-foot-wide cleared easement in wetlands. Trees within 15 feet of the pipeline with root systems that could compromise the integrity of the pipeline coating would also be selectively removed, for a total maintenance corridor of up to 30 feet. For more information on wetland impacts associated with the Project see Resource Report 2.
[d] ATWS associated with temporary Access Roads 2 – 4 is captured in the overall pipeline lateral ATWS.
[e] ATWS associated with permanent Access Road 1 is captured in the overall Compressor Station 394 ATWS.
[f] ATWS associated with permanent Access Road 5 is captured in the overall A/G Tie-in facility ATWS.

Invasive Species

According to a letter from the TPWD received by Natural on October 5, 2016, disturbed areas are especially susceptible to infestation of invasive terrestrial plant species. These species include Johnson grass, bahiagrass, Bermudagrass, King Ranch bluestem, other old world bluestems, and Bastard cabbage.

Impacts and Mitigation

Most of the impacts on vegetation resulting from construction would affect open land and forest. Construction activities would remove surface vegetation from approved work areas including the removal or leveling of stumps. Stumps would be cut flush with the ground and left in place in wetlands, except where removal is necessary to facilitate the creation of a safe and level workspace and within the pipeline trench. Construction of the pipeline would require a construction right-of-way of 100 feet in uplands and 75 feet in wetlands. Following construction a permanent 50-foot-wide right-of-way would be retained.

Project areas associated with new permanent aboveground facilities and permanent access roads would require the permanent conversion of vegetation to impervious, unvegetated surfaces. Clearing forest vegetation would also result in a long-term impact on wildlife and vegetation. Although the Project would contribute to forest fragmentation, much of the forest in the Project areas has been previously fragmented by logging, existing utility lines, roads, and residential properties. Vegetation could also be affected in the event of a spill or release of hazardous material during construction. In the event that this would occur, Natural would implement measures in its ECMP and SPRP.

Disturbed areas that would not be maintained as permanent right-of-way or would not be permanently fenced and maintained or contain permanent aboveground infrastructure would be revegetated following construction activities. Impacts to vegetation would be minimized by implementing measures in the ECMP. These include:

- revegetating all disturbed work areas following the completion of construction, unless otherwise requested by the landowner;
- preparing a seedbed to a depth of three to four inches using appropriate equipment; and
- adhering to recommended seed mixes, application methods and rates, and timing windows provided by local resource agencies or as requested by the landowner.

In a letter dated October 5, 2016 the TPWD recommended that all disturbed upland areas be restored to pre-construction contours and planted with a mixture of native herbaceous species. In order to implement these suggested measure Natural would plant TPWD preferred site-specific native species, which includes pollinator species. Based on consultation with the NRCS, native grasses that would be used during reseeding activities include little bluestem, yellow Indian grass, Eastern gammagrass, big bluestem, and switchgrass.

Construction or maintenance activities have the potential to increase infestations of noxious weed species, especially if native vegetation is to be cleared. Soils and mud on vehicle and equipment tires, tracks, and undercarriages have the potential to carry weed seeds and plant materials. Invasive or non-native species could also spread across access road and Project work areas. The potential for the introduction and/or spread of non-native species would be minimized by the implementation of the following measures:

- ensuring all construction equipment is cleaned prior to beginning work on the Project;
- requiring the construction contractor to use certified weed-free straw or hay bales for sediment barrier installations and/or mulch;
- controlling non-native or invasive plant species along the permanent easement and within fenced aboveground facilities using mechanical or herbicide application, as necessary;
- following the ECMP to ensure that soil movement and the associated movement of non-native seeds are minimized;
- using techniques that minimize the time bare soil is exposed, and thus minimize the opportunity for invasive species to become established; and
- monitoring the disturbed sites following construction to ensure that revegetation with suitable plant species has been successful and that invasive or non-native species have not become established.

Based on the types and amounts of vegetation affected by the Project and Natural's proposed avoidance, minimization, and mitigation measures to limit Project impacts, we conclude that impacts on vegetation from the proposed Project would not be significant.

B.4.2 Fisheries

Existing Conditions

All waterbodies crossed by the project are classified by the TPWD as warmwater fisheries. However, as they are ephemeral they do not support year-round fisheries. The pipeline portion of the Project crosses four small tributaries of the Fin and Feather Club Lake. This is a private lake which is popular for recreational fishing and is located approximately 150 feet from the Project area at its closest location.

Impacts and Mitigation

Pipeline construction activities could cause impacts downstream of the Project area due to increased sedimentation and turbidity; or through the introduction of water pollutants from accidental spills or leaks associated with fuel storage and equipment maintenance. However, the erosion containment and spill prevention measures included in the ECMP and SPRP, should eliminate or minimize migration of turbidity or fuels products from the immediate construction work areas. Therefore, we conclude that there would be little or no impact on fisheries.

B.4.3 Wildlife

Existing Resources

As mentioned above, the Project would impact distinct vegetation cover types including open land, forests, wetlands, and developed land. Common wildlife anticipated to be present in each of the four general habitat types are listed below.

- Open Land: Wildlife species common to open land include red fox (*Vulpes vulpes*), coyote (*Canis latrans*), northern mockingbird (*Mimus polyglottos*), Virginia opossum (*Didelphis virginianus*), and mourning dove (*Zenaida macroura*).

- Forest: Wildlife species common to forested land include white-tailed deer (*Odocoileous virginianus*), eastern screech owl (*Megascops asio*) red-headed woodpecker (*Melanerpes erythrocephalus*), eastern fox squirrel (*Sciurus niger*), raccoon (*Procyon lotor*) and eastern cottontail (*Sylvilagus floridanus*)

- Wetland: Wildlife species common to wetlands include American bullfrog (*Lithobates catesbeianus*), green tree frog (*Hyla cinerea*), mallard (*Anas platyrhynchos*), great egret (*Ardea alba*), great blue herons (*Ardea herodias*) beaver (*Castor canadensis*), muskrat (*Ondatra zibethicus*), and nutria (*Myocastor coypus*)

- Developed: Developed land typically does not provide good quality habitat for wildlife species; however, a variety of human commensal wildlife species may use developed areas including Virginia opossum, brown rat (*Rattus norvegicus*), common grackle (*Quiscalus quiscula*), rock dove (*Columba livia*), European starlings (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*).

Impacts and Mitigation

Potential impacts on wildlife from Project construction activities include loss of vegetation and habitat, as well as temporary species displacement and disturbance of wildlife species due to noise from construction and operational activities. Construction could result in the mortality of less-mobile animals such as small rodents, reptiles, amphibians, and invertebrates that may be unable to escape the immediate construction area. Mobile species would leave the area and relocate in neighboring suitable habitat. However, stockpiling of cleared vegetation, topsoil, excavated spoils, and construction materials could inhibit wildlife movement by creating barriers for smaller species. In addition, some species may be unwilling to cross a cleared area without concealing vegetative cover.

The construction of CS 394 would result in a permanent conversion of open land and forested vegetative covers to developed areas. Following construction, security fences would be installed around the permanent operational compressor station facilities. These fenced areas would create a permanent barrier for some terrestrial species; however there is sufficient undisturbed land adjacent to the facilities that would be open for uninhibited wildlife movement. The construction of CS 394 would also cause permanent noise impacts in the area surrounding the Project. However noise levels would attenuate with distance from the facility and may result in sensitive wildlife relocating to similar adjacent habitats.

To minimize impacts from temporary and permanent habitat and vegetation removal along the pipeline, Natural would minimize the amount of time that the trench would be open for construction and would inspect the trench each morning prior to the start of construction. Natural would also ensure that all workers would participate in environmental training that outlines the appropriate steps to take in the event that wildlife is encountered during construction activities. In addition all work

areas that would not be permanently graveled, paved, or contain buildings or aboveground infrastructure would be revegetated according to measures in the ECMP.

Based on the small area, the presence of similar habitats adjacent to and in the vicinity of construction activities, and the implementation of impact avoidance and minimization measures, we conclude that construction and operation of the Project would have only minor impacts on wildlife.

Unique and Sensitive Vegetation and Wildlife Resources

For the purposes of this analysis, special-status species include fish, wildlife, plants, habitats, and vegetation communities that are protected by law or otherwise afforded special consideration by jurisdictional resource agencies as discussed in the following sections.

Migratory Birds and Bald and the Golden Eagle Protection Act (EGEPA)

Existing Resources

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 Migratory Bird Treaty Act (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 United States Fish and Wildlife Service (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 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 Endangered Species Act (ESA), the NGA, or any other statutes and does not authorize the take of migratory birds.

A variety of migratory bird species, including songbirds, raptors, and waterfowl utilize the habitat found within the Project area. USFWS established Birds of Conservation Concern (BCC) lists for various regions in the country in response to the 1988 amendment to the Fish and Wildlife Conservation Act, which mandated USFWS to identify migratory nongame birds that, without additional conservation actions, were likely to become candidates for listing under the ESA. The BCC lists were last updated in 2008.

The Project is located within Bird Conservation Region 25-West Gulf Coastal Plain/Ouachitas (USFWS, 2008). Natural conduced field surveys in the spring of 2016 to evaluate wildlife habitat in the Project area. A list of BCC species that may occur in the project area and the habitat requirements for each is provided in Appendix E.

The bald eagle is a large bird of prey whose range covers virtually all of North America. Although no longer federally listed under the ESA, the bald eagle is protected under the BGEPA and MBTA. The BGEPA and MBTA prohibit killing, selling, or harming eagles or their nests, and the BGEPA also protect eagles from disturbances that may injure them, decrease productivity, or cause nest abandonment. No eagle nests were identified during field surveys.

Impacts and Mitigation

The potential impacts of the Project on migratory birds, including BCC-listed birds, would include the temporary and permanent loss of habitat associated with the removal of existing vegetation. The greatest potential to impact migratory birds would occur if Project construction activities such as grading, tree clearing, and construction noise take place during the nesting season. This could result in the destruction of nests and mortality of eggs and young birds that have not yet fledged. Clearing and grading would also temporarily remove nesting and foraging habitat and could destroy occupied nests resulting in the mortality of eggs and young, unfledged birds, if these activities are done during the nesting season.

Migratory birds, including BCC-listed birds, could also be affected during Project operation, which would permanently convert up to 9.6 acres of upland forest land to an herbaceous state. The reduction in available forest habitat could result in increased competition, a potential increase in parasitic bird species, edge effects, and ongoing disturbances associated with periodic mowing and other facility maintenance activities. It should be noted that the majority of the forested habitat in

the Project area has been recently disturbed through selective clearing and has been fragmented due to existing utility rights-of-way, roads, and timber harvests.

To minimize impacts on migratory birds, Natural would conduct restoration in accordance with the ECMP. Also, Natural would conduct tree clearing outside of the breeding/nesting season (April 15 through August 1).

Natural provided these mitigation measures to the USFWS in a concurrence request letter dated July 11, 2016 as well as in a phone call and email on November 14, 2016. On November 15, 2016 the USFWS stated that the measures proposed by Natural are consistent with what is recommended for similar projects and that no additional measures are recommended in reference to migratory bird protection.

We conclude that the loss of forest habitat would not result in population-level impacts on migratory birds in the region, that impacts on migratory birds (including BCC-listed species) would be minimal, and that effects on their habitat would be minimized.

B.4.4 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 ESA, or are considered as candidates for such listing by the USFWS, and those species that are state-listed as threatened or endangered.

Federal Listed Species

On July 11, 2016 Natural, 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 potentially affected by the Project.

We identified three federally listed species that could potentially occur in the Project area for the pipeline portion of the Project and the construction of CS 394 in Cass County: the least tern (*Sterna antillarum*), the piping plover (*Charadrius melodus*), and the red knot (*Caliidris canutus rufa*). However, according to the USFWS' Information Planning and Consultation (IPaC) system these species are only considered imperiled for wind energy projects.

Based on the information above, the Project would have no effect on any federally-listed species.

State Listed Species

Natural reviewed the TPWD county list for state listed species. The species that were identified to have the potential to occur in the Project area in Cass County are presented in Appendix F.

Based on field surveys, Natural determined that the Project would have no effect on 14 of the 19 state listed species. Natural also determined that the Project is unlikely to affect the remaining five state listed species (Bachman's sparrow, bald eagle, alligator snapping turtle, scarlet snake, and timber rattlesnake).

Natural submitted a letter to the TPWD on July 11, 2016 requesting concurrence with the determinations of the impacts on state listed species. The TPWD responded on August 3, 2016.

In this letter the TPWD stated that the listed timber rattlesnake and Northern scarlet snake may potentially occur within the Project area and are at risk of being affected by construction activities due to their limited mobility. Natural would implement the following TPWD suggested best management practices to minimize the potential impacts on the timber rattlesnake and Northern scarlet snake:

- All construction personnel would be required to complete environmental training. The environmental training would include identification of timber rattlesnakes and northern scarlet snakes, along with procedures to follow if these species are observed during construction.
- Natural would keep trenching and backfilling crews close together to minimize the amount of trenches left open at any given time. Trenches and/or excavation areas that are left open overnight would be inspected each morning prior to the start of work and backfilling activities. Further, Natural would install ramps at the TPWD recommended interval of 90 meters, to allow trapped wildlife to exit the trench.
- If a timber rattlesnake or Northern scarlet snake is encountered during construction, Natural would allow the animal(s) to leave the Project area. If the animal(s) does not or cannot leave the area, only an individual permitted with the TPWD would be allowed to handle the animal(s).
- Natural would ensure that any erosion control blankets or mats used during construction either do not contain netting or contain loosely woven natural fiber netting in which the mesh design allows the threads to move, thereby allowing the expansion of the net openings.
- Natural would not use plastic mesh netting. If timber rattlesnakes or Northern scarlet snakes are observed on site during construction, Natural would report

the observation to the TPWD to aid in the scientific knowledge of the species' status and current range.

The TPWD also stated in the August 3, 2016 letter, that seven plant species of greatest conservation concern occur in Cass County. These plant species are listed in Appendix G.

Natural conducted field surveys in March and May 2016. During this time the assessment of potential impacts to the protected species of greatest conservation need was conducted by comparing the preferred habitat of each species with the habitats observed within the Project area. In addition the Texas Natural Diversity Database (TXNDD) was also examined. As shown Appendix G, no affects to any of the seven plant species of greatest conservation need identified by the TPWD in Cass County are anticipated.

In the August 3, 2016 letter, the TPWD stated that populations of the migrating monarch butterfly (*Danaus plexippus*) have been declining. Natural committed to implementing the following measures, as recommended by the TPWD, to protect the monarch butterfly in the Project area:

- Natural would implement the recommended revegetation efforts by utilizing *Asclepias spp.* and nectar plants during reseeding activities.
- Natural consulted with the local NRCS office regarding recommended pollinator species to be utilized during reseeding activities. On November 15, 2016, the NRCS recommended to include at least five of the following species: Texas Indian paintbrush (*Castilleja indivisa*), winecup (*Callirhoe involuvrata*), scarlet sage (*Salvia coccinea*), Indian blanket (*Gaillardia pulchella*), lemon beebalm (*Monarda citriodora*), Southern wild senna (*Senna marilandica*), butterflyweed (*Asclepias tuberosa*), Mexican hat (*Ratibida columnifera*), black-eyed Susan (*Rudbeckia hirta*), and if available Illinois bundleflower (*Desmanthus illinoensis*).

Based on Natural's mitigation measures described above, the Project is not anticipated to significantly affect state listed species.

B.5 Land Use, Recreation, and Visual Resources

B.5.1 Land Use Affected by the Project

The predominant land uses within the Project area include open land (75%) and forest (24%), wetlands (less than 1%), and developed land (less than 1%). Table 4 summarizes the land use impacts associated with the construction (temporary and

permanent) and operation (permanent) of the Project. Wetlands are discussed in section B.3.3. Developed areas affected by the Project occur at the access road entrances from main public roads. Most of these areas are sparsely vegetated, as they are permanent roadside easements. Impacts on developed land from construction and operation of the Project would not alter the current land use in these areas.

Open Land

The Project will utilize 29.9 acres of open land for construction, including 22.8 acres of permanent impacts associated with the new pipeline easement and aboveground facilities. Along the pipeline lateral, the new permanent easement would be maintained in an herbaceous state and thus, would not result in a change of land use. Operation of CS 394 and the new permanent access roads for the Project would account for the conversion of 22.8 acres of open land to industrial. Aboveground facilities would be maintained as predominantly graveled, fenced facilities. Temporary impacts on open land would be short-term and minor.

Following the completion of construction activities, disturbed areas would be reseeded in accordance with Natural's ECMP, utilizing species recommended by the local NRCS office or as requested by landowners.

Forest

A total of 9.6 acres of forested land would be cleared for construction of the Project (inclusive of land affected during operation). Maintenance of the new permanent easement, aboveground facilities, and permanent access roads, totaling 4.4 acres, would preclude the reestablishment of trees and shrubs following construction. Temporary workspace areas that are cleared for construction would result in long-term impacts due to the time required for trees to reestablish.

Forest areas would be reseeded in accordance with the ECMP, agency requirements and recommendations associated with applicable permits, and landowner agreements. The rate of forest reestablishment in the non-maintained corridor would depend upon the type of vegetation, length of growing season, and natural fertility of the soils.

Pipeline Facilities

Installation of the pipeline lateral would require the use of a 100-foot-wide construction right-of-way. Natural would maintain a 50-foot-wide permanent easement along the pipeline lateral for operation and maintenance purposes.

After construction, in accordance with the ECMP, Natural may maintain a cleared corridor not exceeding 10 feet in width along the permanent easement in upland areas, as necessary, and may maintain the entire 50-foot-wide cleared permanent easement no more frequently than every three years.

The pipeline lateral would cross two of Natural's existing natural gas pipelines at mileposts 0.04 and 0.05 as the lateral exists CS 394. Natural would cross the pipelines utilizing an open ditch method to lay the proposed pipeline below the existing lines.

ATWS would be required to facilitate construction spoil storage associated with wetland and waterbody crossing, for equipment turning along access roads, and for the existing pipeline crossings. ATWS would be set back at least 50 feet from the edge of wetlands and waterbodies (see Appendix A for a list of site-specific exceptions to the 50-foot setback requirement). A total of 1.5 acres of ATWS would be temporarily utilized during construction of the pipeline lateral, including ATWS for temporary access roads, however, all ATWS would be restored to –re-construction conditions following construction. Locations, dimensions, acreages, and justification associated with the ATWS areas required for construction of the pipeline lateral are presented in Appendix D.

Aboveground Facilities

Compressor Station 394 and A/G Tie-in Facility

A total of 21.5 acres would be utilized during construction and operation of CS 394, and 0.29 acre would be required for construction and operation of the tie-in facility. The current land use at the proposed CS 394 consist primarily of open land as well as minor amounts of forest, while the Tie-in facility consists entirely of forest. After the completion of construction, both facilities would be fenced, and land within the permanent footprints not covered by rock would be maintained in an herbaceous state. In addition, a small 100 square foot area would be fenced around a tap valve and aboveground operator located 0.01 mile north of the fence line for the tie-in facility; however, this land would be maintained in an herbaceous state.

Additional Temporary Workspace

A total of 3.4 acres of ATWS would be utilized for construction of the aboveground facilities, including 2.6 acres of ATWS associated with construction of CS 394 and permanent Access Road 1 and 0.8 acre associated with the tie-in facility and permanent Access Road 5. ATWS would be restored to pre-existing conditions following construction activities, resulting in no permanent impacts. Locations, dimensions, acreages, and justification associated with the ATWS areas required for

construction of the aboveground facilities and permanent access roads are presented in table 5.

Table 5– Aboveground Facilities Additional Temporary Workspace Justification

ATWS ID	Facility	Dimensions (feet)		Justification	Land Use
		Length	Width		
16	A/G Tie-in facility	Irregular		ATWS necessary to accommodate safe turning of large equipment from the access road , to provide additional vehicular parking area for the interconnecting facility, to provide temporary material storage for interconnecting facility, and to accommodate additional spoil for installing connecting taps	Open, Forest
19	Access Road 5	50	25	ATWS necessary to accommodate safe turning of large equipment onto the permanent Access Road 5 from the public road.	Open, Developed
20	Access Road 5	50	25	ATWS necessary to accommodate safe turning of large equipment onto the permanent Access Road 5 from the public road.	Open, Developed
28	Access Road 1	150	25	ATWS necessary to accommodate safe turning of large equipment onto the permanent Access Road 1 from the public road.	Open, Developed
29	CS 394	113	200	ATWS necessary to provide additional vehicular parking areas for CS 394, and to provide temporary material storage and equipment staging for CS 394.	Open, Forest
30	CS 394	373	340	ATWS necessary to provide additional vehicular parking areas for CS 394, and to provide temporary material storage and equipment staging for CS 394.	Open, Forest

Access Roads

Access roads utilized during construction will allow for the passage of a wide range of vehicles, including high clearance vehicles and heavy trucks. A total of three temporary access roads (Access Roads 2, 3, and 4), requiring 3.9 acres of land, would be utilized for construction of the pipeline lateral. Access Roads 2 and 4 are located along maintained pipeline corridors; whereas, Access Road 3 is an existing dirt road. Access Roads 2, 3, and 4, would be returned to pre-construction conditions following completion of the Project.

Two permanent access roads (Access Roads 1 and 5) comprising 0.91 acre of open land and developed land, will be utilized for access to the Project area during construction and operation of the aboveground facilities. Access Road 1 will be graveled and will provide permanent access to CS 394 during operation. Access Road 5 will be along the existing Amarillo to Gulf Coast Pipeline permanent easement and will be graveled for permanent access to the tie-in facility.

All of the existing roads and easements would require modifications and improvements to allow for the safe passage of construction equipment and vehicles. The majority of the modifications would include grading and the addition of gravel to stabilize the road and minor tree trimming. In some instances, the road would also need to be extended with a gravel pad or apron at the entrance from a public road. Post construction, all temporary access roads would have gravel removed and be returned to pre-construction conditions; unless otherwise requested by the landowner. Details regarding the access roads that would be utilized for the Project facilities are provided in table 6 (Temporary and Permanent Access Roads for the Project) includes the access road ID, Milepost location, proposed use and existing use, upgrade requirements, length, and width.

Table 6 - Temporary and Permanent Access Roads for the Gulf Coast Expansion Project

Access Road ID	Milepost	Proposed Use	Existing Use	Upgrade requirements	Approximate Length (feet)	Approximate Width (feet)
Access Road 1	0.00	Permanent (CS 394)	Open land	Clearing, grading, and graveled	961	60
Access Road 2	0.04	Temporary	Open land	Grading and gravel	2,338	30
Access Road 3	0.48	Temporary	Existing dirt road	Gravel	2,063	30
Access Road 4	0.77	Temporary	Open land	Grading and gravel	1,282	30
Access Road 5	0.77	Permanent (A/G Tie-in Facility)	Open land	Grading and gravel	520	30

Existing Residences and Buildings

Residential land is described as existing residential areas that include single and multiple family dwellings as well as landscaped areas or driveways associated with an immediate residence. Table 7 provides a list of all structures within 100 feet of the Project area along with the structure type, and approximate distance from the Project. Structures were identified during field reconnaissance surveys and through review of aerial imagery. No structures were identified within 100 feet of the Project construction corridor for the pipeline or workspace associated with the aboveground

facilities. Two residences, and one garage, are located within 100 feet of Access Road 2, which would be used for temporary access during Project construction.

Table 7 - Structures Occurring within 100 feet of the Gulf Coast Expansion Project

Structure ID	Structure Type	Distance from Edge of Project Area (feet)
Access Road 2		
1	Residence	46
2	Garage	56
3	Residence	45

Construction of the Project facilities could result in short-term impacts on residential areas in close proximity to the access road, including increased construction-related traffic on local roads, as well as dust and noise generated during construction. Natural would minimize impacts on nearby residences through implementation of the measures outlined in the ECMP to reduce dust and noise during construction activities and limiting construction activities to daytime hours whenever feasible. Based on the above analysis, we conclude that the Project would result in minimal impacts on the current land use.

B.5.2 Recreation, and Other Designated Areas

The Project does not cross and is not located within 0.25 mile of any National Parks, or any National Wilderness Areas or registered National Landmarks (NPS, 2016; Wilderness.net; 2016). Additionally, the Project is not located within 0.25 mile of any state park, forest, or wildlife management area (Texas Parks and Wildlife, 2016a; 2016b). The Project would not cross any Wetlands Reserve Program or Grassland Reserve Program lands (Stone, 2016 NRCS, 2016). The Project does not cross any rives in the National Wild and Scenic Rivers System, and the nearest waterbody within this system is the Saline Bayou, located approximately 85 miles southeast of the Project in Natchitoches Parish, Louisiana (National Wild and Scenic Rivers System, 2009). No National Scenic Byways are crossed by the Project (FHA, 2016). According to the maps of Coastal Management zones form the National Oceanic and Atmospheric Administration, the Project is not located within a Coastal Management Zone (2012). Therefore, we conclude that construction and operation of the Project is not expected to have an impact on recreational and other designated areas.

B.5.3 Visual Resources

Impacts on visual and/or aesthetic resources would primarily occur during construction as a result of vegetation clearing and the presence of construction equipment. The majority of impacts on visual resources would be temporary; however, the creation of new easements and the installation of new aboveground facilities, including CS 394 and the tie-in facility would be permanent. However, CS 394 and tie-in facility would be surrounded by forest; therefore, visual impacts from the Project's aboveground facilities would be minimal, and additional visual screening methods are not anticipated to be necessary.

The Project would require the construction of two new permanent access roads, Access Road 1 for CS 394, and Access Road 5 for the A/G Tie-in facility. Access Road 1 would be located adjacent to Natural's existing Gulf Coast Mainline permanent easement and would be located approximately 790 feet from the nearest residence. Access Road 1 would be partially obscured from the residence by interspersed trees. CS 394 would be operated remotely; therefore, traffic would be minimal, consisting of occasional use by light-duty trucks. Access Road 5 would be located along Natural's existing Amarillo to Gulf Coast Pipeline permanent easement and is located within approximately 530 feet of two residences. Trees would line either side of the access road, naturally screening it form view of the residences. Additionally, Access Road 5 would only be used periodically for maintenance purposes and would not result in adverse impacts on visual resources surrounding the nearby residences. Therefore, we conclude that CS 394 and tie-in facility would not have significant adverse impacts on visual resources.

B.6 Cultural Resources

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

Natural completed a cultural resources survey for the project, and provided the resulting survey report to the FERC and Texas State Historic Preservation Office (SHPO). The survey employed surface inspection augmented by shovel testing, and included both archaeological and architectural resources. The survey covered a 40-acre tract for Compressor Station 394, a 300-foot-wide corridor for the pipeline, a 100-foot-wide corridor for the two permanent access roads, and a 50-foot-wide

corridor for the three temporary access roads. Approximately 85.0 acres were examined.

As a result of the survey, two newly recorded historic debris scatters (41CS353 and 41CS354), and one isolated historic find were identified. The portion of site 41CS353 within the Project area was recommended as a non-contributing element to NRHP eligibility. Site 41CS354 and the isolated find were recommended as not eligible for the NRHP. No architectural resources were identified, and no further investigations were recommended for the Project. On July 5, 2016, the Texas SHPO indicated that no historic properties would be affected by the project. In addition, Natural provided a "Blanket Clearance Agreement" with the SHPO, covering the proposed activities at Compressor Station 301, which stipulates certain construction activities not requiring review by the SHPO. We agree with the SHPO and find that the project would not affect historic properties.

Natural contacted the following Native American tribes, providing a project description, mapping, and a summary of the survey results: Alabama-Coushatta Tribe of Texas; Alabama Quassarte Tribal Town of Oklahoma; Apache Tribe of Oklahoma; Caddo Nation of Oklahoma; Chickasaw Nation; Choctaw Nation of Oklahoma; Comanche Nation of Oklahoma; Coushatta Tribe of Louisiana; Delaware Nation; Delaware Tribe of Oklahoma; Iowa Tribe of Oklahoma; Jena Band of Choctaw Indians; Kialegee Tribal Town of Oklahoma; Kickapoo Tribe of Oklahoma; Kiowa Tribe of Oklahoma; Miami Tribe of Oklahoma; Mississippi Band of Choctaw Indians; Muscogee (Creek) Nation; Osage Nation; Poarch Band of Creek Indians; Quapaw Tribe of Oklahoma; Seminole Nation of Oklahoma; Shawnee Tribe of Oklahoma; Thlopthlocco Tribal Town; Tonkawa Tribe of Oklahoma; Tunica-Biloxi Indian Tribe of Louisiana; United Keetoowah Band of Cherokee Indians in Oklahoma; and Wichita and Affiliated Tribes.

In a letter dated July 7, 2016, the Coushatta Tribe of Louisiana concurred with a finding of "no historic properties affected," and requested to be notified in the event of unanticipated discoveries during construction. In a letter dated July 11, 2016, the Tonkawa Tribe of Oklahoma indicated it had no specifically designated historical or cultural sites in the project area, but requested to be notified in the event of inadvertent discoveries during construction. In response to follow-up phone calls and emails from Natural, the Chickasaw Nation, Choctaw Nation of Oklahoma, Delaware Nation, Delaware Tribe of Oklahoma, Kickapoo Tribe of Oklahoma, Mississippi Band of Choctaw Indians, and Quapaw Nation indicated no concerns with the Project. The Alabama-Coushatta Tribe of Texas, Caddo Nation of Oklahoma, Comanche Nation, Jena Band of Choctaw Indians, Muscogee (Creek) Nation, Osage Nation, and United Keetoowah Band of Cherokee Indians in Oklahoma indicated no historic properties would be affected by the project, but

requested to be notified of inadvertent discoveries during construction. No other comments have been received. We sent our NOI to these same tribes. The United Keetoowah Band of Cherokee Indians in Oklahoma requested a cultural resources survey be conducted. Natural conducted the survey and provided the resulting report to the tribe. No other responses to our NOI have been received from the tribes. In response to our NOI, the Bureau of Indian Affairs indicated it had no concerns with the project.

Natural provided a plan to address the unanticipated discovery of cultural resources and human remains during construction. We reviewed the plan and find it acceptable.

B.7 Air Quality and Noise

B.7.1 Air Quality

Air quality would be affected by construction and operation of the Project. Though air emissions would be generated by operation of equipment during construction of the Project, most air emissions associated with the Project would result from the long-term operation of the compressor station. This section of the EA addresses the construction and operation emissions from the Project, as well as projected impacts and compliance with regulatory requirement.

Operation of the proposed CS 394 would be the primary source of long-term air quality impacts associated with the Project. A natural gas-fired turbine has been selected for installation at CS 394. The proposed Solar Turbines Mars 100 unit is manufactured by Solar Turbines and equipped with a system that achieves low emissions of nitrogen oxides (NO_x) through the use of lean-premix combustion technology, which is an alternative to older control techniques that involve water or steam injection into the combustion chamber. In addition to the compression equipment, CS 394 would also contain ancillary emission sources associated with an emergency generator, a small heater, storage tanks, natural gas venting, and fugitive emissions from natural gas equipment leaks.

The term air quality refers to relative concentrations of pollutants in the ambient air. The subsections below describe air quality concepts that are applied to characterize air quality and to determine the significance of increases in air pollution. This includes metrics for specific air pollutants known as ambient air quality standards, regional designations to manage air quality known as Air Quality Control Regions, and efforts to monitor ambient air concentrations.

The Clean Air Act (CAA) of 1970, amended in 1977 and 1990, is the primary federal statute governing air pollution. The CAA designates six pollutants as criteria pollutants, for which National Ambient Air Quality Standards (NAAQS) have been promulgated to protect public health and welfare. The six criteria pollutants are particulate matter including particulate matter of 10 microns or less (PM_{10}) and particulate matter of 2.5 microns or less ($PM_{2.5}$), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), lead, and ground-level ozone (O_3). Volatile organic compounds (VOC) and not considered a criteria pollutant but are analyzed since VOC are precursors to ground-level ozone formation. Lead emissions are not considered in this section because they are not expected to result from Project activities.

Greenhouse gases (GHGs) occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. The primary GHGs produced by fossil fuel combustion are carbon dioxide (CO_2), methane (CH_4), and NO_2. Emissions of GHGs are typically expressed in terms of carbon dioxide equivalents (CO_{2e}) where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of the heating potential of CO_{2e}, or its global warming potential.

Existing Environment

The U.S. Environmental Protection Agency (EPA) compares ambient air measurements of criteria pollutants from ambient monitoring stations to the NAAQS to assess the status of air quality in the different regions of the U.S. Based on these comparison, regions of the U.S. are designated as either “attainment,” “nonattainment,” or “unclassifiable.” A region is designated as attainment if monitoring shows that ambient concentrations of a specific pollutant are less than or equal to the NAAQS for that pollutant. The Project is located in Cass County which in 40 C.F.R. 81.344 (EPA, 2016c) is currently designated as an attainment area for all criteria pollutants (EPA, 2016c). Therefore, non-attainment New Source review or General Conformity is not applicable.

Permitting/Regulatory Requirements

New Source Review and Prevention of Significant Deterioration

Proposed new or modified air pollutant emissions sources must undergo a New Source Review (NSR) permitting process prior to construction or operation. CS 394 is located within an attainment area for all criteria pollutants; therefore, NSR provisions would not apply.

The PSD major source threshold for criteria pollutants is 100 tons per year (tpy) for 28 specifically listed source categories. For unlisted source categories, such as natural gas compressor stations, the PSD major source threshold is 250 bpy of potential emissions of any criteria air pollutant. Appendix H indicates that PSD major source criteria is below the threshold requirements for PSD permitting, therefore PSD would not be applicable for CS 394.

New Source Performance Standards Requirements

CS 394 would be subject to the Federal Standards of Performance for Stationary Combustion Turbines (Turbine NSPS). Pursuant to 40 C.F.R. § 60.4320(a), the turbine must meet the applicable NO_x emission limit set forth in table 1 to 40 C.F.R. Part 60, Subpart KKKK.

Pursuant to 40 CFR § 60.4340(a), annual performance tests must be conducted on the turbine to demonstrate continuous compliance with the NO_x limit.

The Turbine NSPS also limits the sulfur content of the fuel burned in the turbine. Pursuant to 40 C.F.R. 60.4330(a)(2), the fuel burned in the unit cannot contain total potential sulfur emissions in excess of 0.060 pound (lb) SO_2 per million British thermal units (MMBtu).

Natural would also ensure that all of the monitoring, recordkeeping, and reporting requirements from this rule are met in accordance with the specified timeframes.

The reciprocating internal combustion engine planned for installation at CS 394 as an emergency generator would be subject to the *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines,* 40 C.F.R. Part 60, Subpart JJJJ.

National Emission Standards for Hazardous Air Pollutants

The National Emission Standards for Hazardous Air Pollutants (NESHAPs) codified in 40 CFR 61 and 63; regulate the emissions of hazardous air pollutants (HAPs) for existing and new sources. The emission sources included in the Project would not emit pollutants regulated under 40 CFR 61; therefore, these NESHAP regulations would not apply. The 1990 CAA Amendments established a list of 189 HAPs, resulting in the promulgation of 40 CFR 63 NESHAP (Part 63). Part 63 regulates HAP emissions specific source types. This Project would not have PTE total HAPs emissions in excess of 25 tons per year (tpy), or the PTE any single HAP

emissions in excess of 10 tpy. However, potentially applicable regulations are discussed below.

Subpart M (*Asbestos Demolition and* Renovation) applies if during construction of the Project if conducting demolition and/or renovation activities asbestos containing material are found.

Subpart ZZZZ (*Stationary Reciprocating Internal Combustion Engines*) applies to area and major sources of HAPs that are new, existing, or reconstructed depending on the power rating of the reciprocating internal combustion engine.

BACT and MACT Requirements

Best Available Control Technology (BACT) at each emission unit is a required component of PSD permitting. CS 394 would not be subject to PSD review; therefore, a BACT analysis would not be required as part of the permitting process.

Clean Air Act General Conformity

The Project areas are in attainment/unclassifiable (considered attainment) for all criteria pollutants; therefore, a General Conformity analysis would not be required.

Greenhouse Gas Reporting and Permit Requirements

EPA's Mandatory GHG Reporting Rule is promulgated as 40 C.F.R. Part 98. Section 98.2(a)(2) specifies that GHG reporting requirements apply to a facility that contains any source category listed in 40 CFR 98, and that emits 25,000 metric tons of CO_2e or more per year in combined emissions from stationary fuel combustion units, miscellaneous uses of carbonate, and all applicable source categories. Potential GHG emissions from CS 394 are above the reporting threshold; however, the requirement to report is only triggered if actual GHG emissions are above the threshold in any given year. Annual GHG emissions from CS 394 would be tracked and emissions would be reported if required under 40 C.F.R. Part 98.

Texas Air Permitting Requirements

This section summarizes state-level regulatory requirements that are applicable to the Project. General requirements that are unrelated to approval for construction and operation (such as emissions reporting requirements) are not summarized herein.

Title V of the CAA requires states to establish an air operating permit program. The requirements of Title V are outlined in 40 CFR Part 70, and the permits required by these regulations are often referred to as Part 70 permits. These rules are incorporated into Texas regulations as 30 Texas Administrative Code ("TAC") Chapter 122. As outlined in 30 TAC § 122.10(14), the major source thresholds are 100 tpy for each criteria pollutant, 10 tpy for each individual HAP, and 25 tpy for total HAP. The potential emissions associated with operation of CS 394 do not exceed the major source thresholds established under 40 CFR 70; therefore, a Title V operating permit would not be required for CS 394.

Impacts and Mitigation

Construction Emissions and Impacts

Construction activities at the Project would result in temporary, localized emissions that would last for the duration of the construction period. Table 8 identifies the construction emissions for the Project. Construction emissions were calculated based on commuting to the construction site and the construction equipment emissions. Exhaust emissions of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), sulfur dioxide (SO_2), $PM_{2.5}$ (particulate matter less than 2.5 microns in diameter), PM_{10} (particulate matter less than 10 microns in diameter), greenhouse gases (GHGs), and hazardous air pollutants (HAPs) from construction equipment and vehicle engines used Project construction have been estimated based on the anticipated types of equipment as well as the frequency, duration, and levels of use.

Construction activities associated with the abandoned units would involve minimal localized ground disturbance in previously disturbed areas to cut pipe and disconnect the abandoned units. Ground disturbance activities would occur entirely within previously disturbed upland areas of the existing CS 301 station yard. Therefore, we conclude that the potential construction emissions for the abandoned units would be minimal and we have not included these in table 8.

Emissions from construction are not expected to result in a violation of any applicable ambient air quality standard. Construction equipment would be operated on an as-needed bases during daylight hours only. Gasoline and diesel engines used during construction would be operated and maintained in a manner consistent with the manufacturers' specifications and EPA standards, thus minimizing emissions.

Table 8 - Summary of Potential Construction Emissions for the Gulf Coast Expansion Project

Construction Activity	Emissions (tons)									
	NO_x	CO	SO_2	TSP	PM_{10}	$PM_{2.5}$	VOC	CO_2e	Formaldehyde	Total HAP
CS 394	6.1	3.2	0.01	19.8	6.35	1.1	0.91	2,170	0.02	0.05
Pipeline Lateral	1.9	0.83	0.00	6.1	2.70	0.4	0.24	666	0.00	0.02
TOTALS (Tons / Project)	**8.02**	**4.00**	**0.02**	**25.9**	**9.05**	**1.5**	**1.15**	**2,835**	**0.02**	**0.07**

Air quality impacts from fugitive dust generation due to soil disturbance and the operation of equipment and vehicles would be temporary, occurring only during the period of construction activities. Fugitive emissions would be intermittent, generally low-level releases, and would consist of larger dust particles that would be expected to settle out of the atmosphere proximal to their release point. Therefore, long-range transport of fugitive particulate emissions from land disturbance is not anticipated. Vehicle equipment and fugitive dust emissions are not expected to exceed ambient air quality standards.

Where necessary, fugitive dust emissions would be controlled by the use of water, calcium chloride, or other acceptable material. If necessary, construction worker traffic would be minimized by the use of offsite parking and shuttle buses.

As stated, impacts from construction equipment would be short-term and would not result in a significant impact on regional air quality or result in any violation of applicable ambient air quality standard.

Operational Emissions and Impacts

The primary emission source associated with CS 394 would be the Solar Turbines Mars 100 natural gas-fired turbine. Ancillary emission sources would likely include a natural gas-fired emergency generator, a natural gas-fired catalytic heater, and 4,200-gallon storage tanks for condensate, oily water, and used lubricating oil. Activities such as compressor blowdowns and purges would emit VOC and GHG and fugitive VOC would be released from natural gas equipment leaks.

Appendix J summarizes the average hourly and annual potential emission rates of potential emission rates of criteria pollutants, formaldehyde, total HAP, and GHG associated with CS 394.

CS 394 would be located in an attainment area, is anticipated to be below the threshold requirements for PSD permitting, and would not be a Title V major source. As a result, air dispersion modeling was performed to determine the ambient air quality impacts from these emission.

As shown in Appendix J CS 394 would not cause or significantly contribute to an exceedance of an ambient air quality standard. Natural would submit an application to the TCEQ to register the emission units at CS 394 under the Permit-by-Rule program.

Dispersion Modeling Results

Dispersion modeling was conducted for the emission units that have quantifiable emissions of a NAAQS pollutant to the atmosphere. The modeling parameters for CS 394 are provided in Appendix I.

These parameters were input into the EPA-approved dispersion model AERMOD 9 version 15181) to calculate downwind ground-level pollutant concentrations.

Results of the modeling are provided in Appendix J and demonstrate that the impacts of regulated pollutant emissions from the planned installation and operation of the CS 394 emission sources would not adversely impact air quality of the Project area. Only a single pollutant/averaging period value is shown to potentially exceed the respective Significant Impact Level (SIL). Modeled concentrations less than a respective SIL indicate no further analysis of that pollutant/averaging period is required.

The pollutant that potentially exceeds a SIL is the 1-hour NO_2 modeled concentration. The modeled NO_2 value conservatively assumes full conversion of exhaust NO_x to NO_2, whereas for typical natural gas-fired units an in-stack ratio of 0.3 is more appropriate. Applying such a ratio would likely return an even lower concentration, perhaps below the SIL, especially given that the impacts occur very near to the source.

Notwithstanding, the appropriate ambient background concentrations as described in the existing air quality section were used to add to the modeled concentration and form an aggregate value for comparison with the NAAQS. As shown in Appendix J, compliance is easily demonstrable; therefore no adverse impacts to existing air quality levels should occur as a result of the operation of CS 394.

Greenhouse Gas Emissions

Greenhouse gases occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. GHGs are gases that absorb infrared radiation in the atmosphere, and have been determined by the USEPA to endanger public health and welfare by contribution to human induced global climate change. The most common GHGs emitted during fossil fuel combustion and natural gas transportation are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Emissions of GHGs are typically expressed in terms of CO_2 equivalents (CO_{2e}), where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of the heating potential of CO_2 over a specific timeframe, or its global warming potential (GWP). The 100-year GWP of CO_2 is 1, CH_4 is 25 and N_2O is 298. During construction and operation of the Project, these GHGs would be emitted from non-electrical construction and operational equipment, as well as from fugitive methane leaks from the pipeline and aboveground facilities. GHG emissions are typically used as a proxy to evaluate impacts on climate change.

The GHG footprint of the Project is small and does not trigger PSD. Changes in GHG emissions rates would result from blowdown vents; isolation valves vents, and pneumatics valves. As indicated in Appendix H an estimated 72,051 metric tons per year of direct CO_{2e} would be attributable to CS 394. The Project capacity is developed through the integration of existing capacity and expansion capacity of 240,000 Dth/d which would enable Natural to transport 460,000 Dth/d of natural gas. Assuming that all of the expanded capacity of 240,000 Dth/d of natural gas that is being transported is used for combustion, downstream end-use would result in about 4.6 million metric tonnes of CO_{2e} per year. These emissions would not have any direct impacts on the environment in the Project area.

Conclusion

The results demonstrate that emissions from the construction and operation of CS 394 and the tie-in facility would not result in significant impacts on air quality. Thus, through implementation of construction work practices, the short duration of the construction activity, a review of the estimated emissions from construction and operation, and an analysis of the modeled air quality from operations, we find there would be no regionally significant impacts on air quality.

B.7.2 Noise and Vibration

Noise is generally defined as sound with intensity greater than the ambient or background sound pressure level. Noise quality can be affected both during construction and operation of projects. 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 to 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_{dn} is an energy average of the daytime L_{eq} (i.e., L_d) and nighttime L_{eq} (i.e., L_n) plus 10 decibel (dB). The A-weighted scale is used 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 A-weighted decibel (dBA); 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise.

Noise sensitive areas (NSAs) are defined as homes, schools, churches, or any location where people reside or gather. The Project area is surrounded by open areas and agricultural areas, with a few noise-sensitive receptors within a one-mile radius to the Project area. Although there are several residential dwellings within a 1-mile radius of the location of the compressor station, the six closest NSA's in each direction were identified and included in the noise assessment.

In 1974, the EPA published its 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 determined that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity noise interference.

Pursuant to 18 CFR 157.206(d)(5), FERC requires that the noise attributable to any new compressor engine or modifications during full load operation not exceed an L_{dn} of 55 dBA at any NSAs. In addition, FERC may impose sound requirements for temporary site construction activities, and FERC generally references the sound level of 55 dBA (L_{dn}) as a "benchmark criterion" for assessing the noise of construction activities.

State and Local Regulations

The proposed CS 394 would be located near the City of Atlanta, Texas, which has a local noise ordinance that is nuisance-based and does not provide any quantitative noise limits. CS 394 is located just outside of Atlanta city limits; therefore, the ordinance is unlikely to apply to the proposed compressor station. However, the proposed A/G Tie-in facility, which would be equipped with a blowdown valve, is located within the Atlanta city limits and is likely subject to the city ordinance.

No other applicable state or local noise regulations have been identified for the proposed facilities.

Construction Impacts

Noise would be generated during construction of the Project facilities. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and localized. The changing number and type of construction equipment at the site would result in varying levels of noise. Construction activities associated with the Project would be performed with standard heavy equipment. The most prevalent sound source during construction would be the internal combustion engines used to power the construction equipment, such as backhoes, track-excavators, and cement trucks. Construction would not generally affect nighttime noise levels as it would be limited to daylight hours. No significant noise impacts are anticipated during construction.

Construction activities associated with the abandoned units would involve minimal localized ground disturbance in previously disturbed areas to cut pipe and disconnect the abandoned units. Therefore, we conclude the noise impacts for these activities would be minimal.

Operational Noise Impacts and Mitigation

Compressor Station 394

Sound generated from operation of Compressor Station 394 would be continuous. A centrifugal compressor rated at 15,900 hp is planned to be installed at the station in an acoustically insulated building. The compressor would be driven by a Solar Mars 100 Turbine. A lube oil cooler would be located outside of the building. Six gas aftercoolers, each with three fans are planned. Additional noise sources include unit suction and discharge piping, a fuel gas skid, and a blowdown vent. Suction and discharge header piping would be buried. An emergency generator would at located at the station.

Sound level measurements were taken at the nearest NSAs around the proposed CS 394. Noise analyses was completed for CS 394 and the anticipated sound levels contributions at NSAs during normal operations are summarized in table 9. The measurements indicate that the current ambient sound levels range from 50 to 63 dBA L_{dn}.

At NSA 1 and NSA 3, the measured ambient values were above 55 dBA L_{dn} and the predicted increase at these NSAs was 0.3 and 0.1 dBA L_{dn}, respectively. NSA 2 would experience a noise increase of 2 dBA and NSA 4 would experience a noise increase of only 0.2 dBA. For reference, an average listener with normal hearing, a change in 3 dBA is considered perceptible.

Table 9 - Anticipated Sound Level Contributions at Noise Sensitive Areas During Normal Operations of Compressor Station 394

NSA	Distance to NSA (feet)	Direction to NSA	Calculated Ambient L_{dn} (dBA)	Estimated L_{dn} of Station (dBA) [a]	Predicted (Combined Station L_{dn} and Ambient L_{dn}) (dBA) [a]	Potential Increase Above Ambient (dB)
1	1,090	NW	63.0	**51.9**	63.3	0.3
2	1,870	NE	49.8	**47.4**	51.8	2.0
3	3,630	E	60.6	**41.3**	60.7	0.1
4	3,730	S	54.4	**41.5**	54.6	0.2

[a] Includes the effect of the anticipated noise control measures for the compressor units.

Blowdown Noise

The noise contribution at NSAs due to gas blowdown events was estimated for CS 394. This is a routine gas blowdown in which gas is vented via a silencer, and can occur when a compressor is stopped and gas between the suction/discharge valves and compressor(s) is vented to the atmosphere through a blowdown silencer.

Because of the short duration (typically ranging from less than one minute to few minutes in some instances and irregular timing of blowdown events, they have almost no influence on the 24-hour L_{dn} values for a facility. The proposed unit blowdown silencer is designed to produce no more than 70 dBA at 300 feet from the stack during the blowdown operation. With a silencer that meets this specification, the maximum predicted sound level during a single unit blowdown event is 50 dBA L_{eq} at NSA 2. This is not the closest NSA to the station, but blowdown noise levels are expected to be louder than at NSA 1 due to shielding effects, as the blowdown silencer would be located on the opposite side of the compressor building from NSA 1.

Blowdown events at the tie-in facility are expected to occur on a rare basis and for maintenance purposes only. Blowdown events at this location would involve small quantities of gas at low pressure, and no noise impacts are anticipated. With a maximum design sound level of 55 dB L_{eq} at a distance of 300 feet, the sound level contribution at the nearest NSA is predicted to be 49 dB(A). A short term noise contribution of this magnitude is not expected to cause a disturbance.

Vibration

Based on the type of driver/compressor (turbine/centrifugal) and other ancillary equipment proposed for CS 394, there would be no detectable increase in vibration at the NSAs. A perceptible level of vibration is extremely unlikely due to proper equipment design, balancing, and maintenance of operational compressor

equipment, which prevent vibrations that could be severe enough to be perceptible outside facility boundaries, as they could likely damage the equipment. The proposed configuration of the compressor station would not produce pulsating gas flow at levels significant enough to induce vibration in the associated piping systems.

Conclusions and Recommendations

While the noise contribution from the station may be perceptible audible at the NSAs during diminished background sound levels, particularly during nighttime hours; on a day-night average basis, the predicted sound level increase at full load station sound contribution at the nearby NSAs would be imperceptible.

However, to ensure that the proposed CS 394 operates within the predicted full load station sound contribution at the nearby NSAs, **we recommend that:**

> **Natural should file noise surveys with the Secretary of the Commission (Secretary) no later than 60 days after placing the Compressor Station 394 in service. If a full load condition noise survey is not possible, Natural 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 the equipment at Compressor Station 394, under interim or full horsepower load conditions, exceeds an L_{dn} of 55 dBA at any nearby NSAs, Natural 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. Natural 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.**

With Natural's commitments to install the noise mitigation measures, and our recommended conditions to ensure that noise from Compressor Station 394 does not increase the predicted noise levels, we conclude that noise impacts resulting from the Project's construction and operation would not be significant.

B.8 Reliability and Safety

The transportation of natural gas by pipeline involves some incremental risk to the public due to the potential for accidental release of natural gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight

inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death. Methane has an auto-ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5 and 15 percent in air. An unconfined mixture of methane and air is not explosive; however, it may ignite if there is an ignition source. A flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses upward rapidly in air.

The proposed facilities for the Project would be designed, constructed, operated, and maintained in accordance with the DOT 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 regulations require the pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency.

The facilities would be within a secured, fenced area and the engines and compressor units within buildings, without access to the public. Based on Natural's commitment to comply with DOT's regulations, construction and operation of the Project would represent a minimal increase in risk to the public, and we are confident that Natural's facilities would be constructed and operated safely.

B.9 Cumulative Impacts

In accordance with NEPA and FERC policy, we evaluated the cumulative impacts of the Project and other projects in the area. Cumulative impacts are the environmental effects that result from the incremental effects of two or more projects occurring in the same general area within a concerted timeframe. Cumulative impacts may result from individually minor, but collectively significant, actions that occur in the same location over a given period of time. Even though certain projects may not occur at the same time or even years apart, their impacts may be of such duration that overlaying the incremental effects of each could result in a greater cumulative impact. Other projects potentially contributing to cumulative impacts are identified in Appendix K.

Cumulative impacts may occur when the environmental effects associated with a project are added to either temporary (construction-related) or continual (operation-related) impacts associated with past, present, or reasonably foreseeable future action. For each resource, the cumulative impact assessment area is defined by the geographic scope.

Anglo settlement in the area that became Cass County began in the 1830s. Initially, agriculture spread with cotton as the main crop. This continued and by 1940 about 57 percent of the county's labor force worked in agriculture, with most of the county's cropland devoted to cotton and corn. During this period, forests of the county supported lumber export. Today, timber, paper industries, agribusiness, and some manufacturing are critical.

The geographic scope for our cumulative impacts analysis depends on the scope and size of the Project (i.e. larger projects would impact a larger area; smaller projects, a smaller area). For the Compressor Station 394, the lateral pipeline, and the tie-in, we considered the impact conclusions from the previous sections of this EA to focus the analysis on resources for which the Project could contribute cumulatively.

We determined that the Project would not contribute discernible cumulative impacts on geology and soils. No mineral resources would be affected by the Project. Given the relative distance to active mining or mineral resource exploration, no anticipated cumulative impacts to geologic resources are expected.

Cumulative impacts on soils would only occur if other projects are constructed at the same time and place as the proposed facilities. Therefore, the geographic scope for cumulative impacts on soils is the footprint of the proposed Project. Potential cumulative impacts associated with soil resources may include loss of agricultural land use at a regional level or diminished fertility of soils directly affected by projects. The land on which the Project is located is not currently being farmed.

Natural would utilize sediment and erosion controls that would be implemented in accordance with its ECMP. Temporary erosion controls such as silt fences, would be installed immediately following land disturbing activities, as required and as needed. The likelihood of cumulative impacts on soils is minimal and would be limited to development or construction activities from other projects directly adjacent to the right-of-way that could increase the erosion potential or affect soils.

Because all affected streams are ephemeral and Natural would manage the minor storm flow currently conveyed by these streams, we determined that the Project would not contribute to cumulative impacts on surface water resources or fisheries. Similarly, the Project would only permanently affect 0.02 acres of wetlands. So, we did not consider cumulative impacts on that resource.

Impacts on cultural resources would also be largely contained within or adjacent to proposed Project workspaces. Therefore, we evaluated other project/actions that overlapped with known areas of potential effects for cultural features potentially affected by the Project. However, as no projects were identified within or adjacent to the Project resources, cumulative impacts on cultural features are not discussed further.

The geographic scope boundary for each remaining resource as well as regulatory guidance to determine the geographic scope for each resource is identified in table 10. Due to the limited scope of the abandonment activities at Compressor 301, we determined that the abandonment would not contribute to regional cumulative impacts.

Table 10 - Resource Specific Geographic Scope for the Project

Resource	Geographic Scope	Rationale
Wildlife, and Vegetation	Watershed boundary (HUC 12)	Impacts wildlife and vegetation could extend outside of the workspaces, but would be contained to a relatively small area. Therefore, for these resources we evaluated other projects/actions within the HUC 12 sub-watershed.
Land Use, Recreation, and Aesthetics	1 mile	Impacts to land uses, recreation, and aesthetics generally occur within and adjacent to project areas.
Air Quality	50 kilometers (air)	The EPA considers 50 kilometers (km) to be the nominal distance at which most steady-state Gaussian plume models such as AERMOD, the EPA's preferred ambient air quality impact assessment model, are applicable.
Noise and Vibration	1 miles	Noise impacts are highly localized and attenuate quickly as the distance from the noise source increases.

For purposes of the cumulative impacts assessment, the proposed pipeline lateral and CS 394 were evaluated as a single Project area as new Project facilities. Since the filing of the application, Natural has determined that there are no nearby municipal water sources; therefore, no waterline would be installed for CS 394 and water supply would be provided by the proposed onsite water well. Activities associated with the nonjurisdictional power supply would occur concurrently and within the same easement as Permanent Access Road # 1 resulting in no disturbance

above and beyond Project impacts; therefore resources would not be cumulatively impacted as a result of the installation of the power supply to CS 394. Appendix K provides a summary of all past, present, and reasonably foreseeable future action were identified in the combined geographic scope (50-km radius for air quality). As noted in Appendix K three past, present, and reasonably future action projects were identified within 50-km geographic scope for air quality but outside the next largest geographic scope (HUC 12 watershed).

Below is a discussion of potential cumulative impacts resulting from the construction and operation of the Project and abandonment activities at CS 301 are provided.

B.9.1 Wildlife, and Vegetation

The Texas Department of Transportation (TXDOT) road widening project is located within the same Hydraulic Unit Code (HUC 12) watershed of the Project. Based on the anticipated schedule of the TXDOT road widening project, revegetation of temporarily disturbed areas is expected to be underway by the time construction would begin on the Project. Due to the short time-frame for reestablishment of herbaceous vegetation impacts on open land temporarily affected by both projects would be negligible. The CS 394 site currently consists of mostly open land that would be permanently converted to industrial land. The portion of State Highway 77 that is proposed to be widened as part of the TXDOT project would result in a similar permanent conversion to industrial land. Based on aerial photography a minor amount of trees were cleared adjacent to State Highway 77 for the planned road widening and the Project would only result in a minor amount of forest clearing.

Impacts on wildlife would primarily occur from the clearing of suitable habitat and noise associated with both the construction and operation of both projects. As mentioned above, the majority of the Project area has been recently cleared which decreases its value as wildlife habitat. In addition, the habitat cleared for the TXDOT road widening project was adjacent to the current State Highway 77 and residential areas which provided limited value for wildlife resources.

Cumulative impacts associated with noise during construction and operation of the Project and the TXDOT road widening project could also occur. However, construction of both of these projects would not be concurrent. Operational noise from CS 394 could serve as a deterrent for wildlife in the immediate area, however the cumulative impact on noise from both of these projects is anticipated to be negligible.

Natural would minimize impacts on vegetation and wildlife habitat by implementing the measures in the ECMP. As described in B.4 of this EA, impacts on vegetation and wildlife for the Projects would be mostly short-term. Based on the fact that the Project would contribute minor and mostly temporary impacts and the limited footprint of the other projects in the region, we conclude that cumulative impacts on vegetation and wildlife would be minor.

We conclude in section B.3.2 of this EA that the Project would have no effect on any federally listed species. As such the project would not contribute cumulatively to any impacts on listed species.

B.9.2 Air Quality

The geographic scope for air quality was considered to be a 50-kilometer radius of the Project. The 50-kilometer ("km") radius is considered by the EPA to be the nominal distance at which most steady-state Gaussian plume models such as AERMOD, the EPA's preferred ambient air quality impact assessment model, are applicable. Additionally, the geographic scope for construction emissions was considered to be 0.25 as recommended.

With respect to air quality, the following projects are located within the 50-km geographic scope and were considered for this cumulative impacts evaluation:

- International Paper Company
- Linn Operating, Inc.
- Tyson Poultry

No projects were identified within the 0.25-mile geographic scope for construction emissions; therefore, no cumulative impacts on air quality as a result of construction of the Project are anticipated.

Natural conducted dispersion modeling identified in Appendix J to assess ambient impacts from the operation emissions at CS 394. The operational emissions from CS 394 are predicted to yield attainment of the NAAQS.

A useful metric in determining the likelihood of overlapping or cumulative impacts is a screening method such as the North Carolina "20D" rule, which relates the annual emissions of a source to the distance from the source and if less than 20D, the likelihood of an overlapping or cumulative impact is very low (Mississippi Department of Environmental Quality, 2016). This Q/D screening method, where Q is the emissions in tons/year and D is the distance in kilometers suggests that as distance from a site increases, the required emissions also increases for the likelihood of a downwind impact to occur. For example, at a distance of 10 km the pending

future emission rate would need to be 200 ton/year (200/10 = 20) to satisfy the 20D rule and have a likely impact.

The 50-km geographic scope for air quality for CS 394 includes a number of counties and parishes in Texas, Arkansas, and Louisiana and air quality permitting information was sought from the air quality agencies in each state. The counties within the geographic scope for air quality includes Cass, Bowie, Marion, Harrison, and Morris counties, Texas, Miller County, Arkansas, and Caddo and Bossier parishes, Louisiana. The Texas Commission on Environmental Quality database was queried for pending permits in each of the five Texas counties. Two pending permits were found for Cass County with the nearest source to CS 394 being the International Paper Company facility located near Queen City, Texas. The pending permit action is for a NCG oxidation unit and listed as a construction type permit. The emissions associated with the permit action are listed as 20 ton/year of NOx, 69 ton/year of SO_2, 35 ton/year of CO, 15 ton/year of PM, and 30 ton/year of sulfuric acid.

The facility is located 20 km north by northeast of the planned CS 394 site. Total emissions of all pollutants (NO_x, SO_2, CO, and PM) are roughly 140 ton/year. Even that very conservative total ton per year estimate is much less than the 400 ton/year value needed to exceed the 20D criteria. Therefore it is unlikely that emissions from this pending project would have a cumulative impact with the CS 394 site. The other pending permit activity for an operation located in Avinger, Texas, Linn Operating, Inc., was noted as a Permit-by-Rule PBR activity. As Avinger is located more than 40 km from CS 394, the distance and low emissions associated with the activity are insufficient to cause a cumulative impact with the CS 394 site.

A number of pending projects were found in the query of permits for Bowie County, Texas. Most of the pending activity is located near Texarkana, Texas which is beyond 40 km from the Project site. None of the emission levels associated with these various pending projects exceeded 100 ton/year. Given the distance from the pending permit locations to the activity site, no cumulative impacts are likely to be associated from pending emissions in Bowie County.

A single pending permit action was found for Marion County, Texas for the Enbridge facility located near Avinger, Texas. The action included the replacement of a compressor engine at the facility which is about 40 km southwest of the CS 394 site. As the permit action was filed under PBR, the emissions associated with the pending permit and the distance to the site, are insufficient to cause a cumulative impact with CS 394. Due to advances in technology and federal emission standards, it is very likely that the compressor engine replacement results in a decrease in

emissions and ambient impacts; therefore the proposed permit action would not cause a cumulative impact with the CS 394 site.

There is a large number of pending permit actions in Harrison County, Texas, with the majority of the pending permit activity located in either Marshall, Texas or Longview, Texas, both of which are located beyond the 50-km geographic scope for air quality for the Project. A single pending permit activity for an operation located in Karnack, Texas was noted as a PBR activity. As Karnack is located more than 40 km from CS 394, the distance and expected low emissions associated with the activity are insufficient to cause a cumulative impact with CS 394.

Pending permit activity for Miller County, Arkansas was obtained from the Arkansas Department of Environmental Quality database. Two permits were found for the Tyson Poultry facility near Texarkana, Arkansas located nearly 40 km from the CS 394 site. Given the distance and type of permits (minor source) emissions would not be expected to exceed the 20D threshold and therefore cumulative impacts from any pending Arkansas permitting activity are not likely to occur with the CS 394 location.

Pending permits in the Louisiana parishes of Caddo and Bossier were obtained from the Louisiana Department of Environmental Quality permits database. No pending permit activity was found at sites located within the 50-km geographic scope in either of these parishes. Therefore, no cumulative impacts would occur from pending permitting activities associated with locations in either of these parishes.

B.9.3 Noise

The geographic scope for noise was considered to be NSAs within 1-mile that may be affected by another project. Noise impacts are highly localized and attenuate quickly as the distance from the source increases.

Construction of the TXDOT road widening project would be complete prior to the start of construction on the proposed Project; therefore, no cumulative impacts resulting from construction noise is anticipated. However, widening the road may allow for increased traffic flows that could result in an overall increase in noise in the area. TXDOT requires traffic noise to meet all Federal Highway Administration noise requirements, and the expansion of State Highway 77 would be subject to these regulations. The impact on traffic volumes as a result of the TXDOT road widening project is not known; therefore, cumulative impacts on noise resulting from operation of the Project cannot be fully assessed. However, based on the low population density in the area and extent of the TXDOT road widening project (1.08

miles) traffic volumes are not expected to double. Further, due to the distance of the TXDOT road widening project from the proposed Project (0.67 mile) it is anticipated that cumulative impacts on noise would be negligible.

B.9.4 Conclusions on Cumulative Impacts

The Project would have a minimal impact on the resources discussed. As demonstrated in Section B.7.1, our air dispersion modeling analyses for the Project indicate that concentrations of criteria pollutants due to operation of CS 394 would remain below applicable NAAQS standards when combined with background concentrations. Therefore, we conclude that pollutants potentially emitted by the operation of CS 394 would not result in a significant cumulative impact when combined with existing ambient air concentrations. Due to the distance of the TXDOT road widening project from the proposed Project we conclude that cumulative impacts on noise would be insignificant. Natural would minimize impacts by utilizing previous cleared/developed land whenever possible. Based on the fact that the Project would contribute minor and mostly temporary impacts and the limited footprint of the other projects in the geographic scope, we conclude that cumulative impacts on vegetation and wildlife would be minor. As previously concluded in this EA, impacts with the Project would be minor and mostly temporary and therefore, when considered with past, present, and reasonably foreseeable projects with the geographic scope, we conclude that cumulative impacts on resources would not be significant.

SECTION C – ALTERNATIVES

In accordance with NEPA and Commission policy, we considered alternatives to the proposed action, including the no-action alternative, system alternatives, and aboveground facility site alternatives. These alternatives were evaluated to determine whether they would be reasonable and provide environmental benefits compared to the proposed action.

Our evaluation of alternatives is based on project-specific information provided by the applicant, affected landowners, and other 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.

The evaluation criteria were considered in the order listed below:

- meeting Natural's stated objectives of the proposed Project (i.e. providing new firm transportation service of 460,000 Dth/d from existing receipt points);
- technical and economic feasibility and practicality; and
- significant environmental advantages over the proposed Project.

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.

The first criterion that must be satisfied before an alternative is considered further is that it must meeting Natural's stated objectives of the proposed Project. The Project is designed to satisfy additional natural gas transportation from defined receipt points to designated delivery points. Any alternative that does not facilitate this purpose is not evaluated here.

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. The determination must then balance the overall impacts and all other relevant considerations. In comparing the impact between resources, we also considered the degree of impact anticipated on each resource. Ultimately, an alternative that results in equal or minor advantages in terms of environmental impact would not compel us to shift the impacts 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 route/facility to a new set of landowners was also factored into our evaluation.

C.1 No-Action Alternative

Under the no-action alternative, Natural would not implement the proposed action. If the Project were not constructed, Natural would not be able to meet the shippers' stated need to transport 460,000 Dth/d of gas supply. Firm transportation capacity on Natural's existing system is not available to meet the shippers' need, and Natural does not have adequate horsepower or pipeline capacity to transport the additional gas volumes. Therefore, the No-Action Alternative is not considered a viable option because it does not meet the Project objectives. Further, the demand for the shippers' transportation capacity would not be met and we assume that alternative infrastructure would be required to satisfy the need. Although this alternative infrastructure is not known, based on the limited footprint of the Project, it is unlikely that any alternative would provide a significant environmental advantage.

C.2 System Alternatives

System alternatives to the proposed action would make use of existing or other proposed natural gas transmission systems/facilities to meet the stated purpose of the Project. Implementing a system alternative would make it unnecessary to construct all or part of the Project, although some modifications or additions to an existing transmission system/facility or other proposed transmission system/facility may be necessary.

Although we did not identify any other existing systems that could meet the Project's objectives, we do consider two other alternatives along Natural's existing natural gas pipeline system, including a loop-only alternative and an existing compression alternative.

Loop-Only Alternative

As natural gas travels through the pipeline system, pressure within the pipe drops as a function of gas velocity, distance, and topography. In order to increase the throughput capacity of a natural gas pipeline, a pipeline operator can "loop" the existing pipeline. A "looping only" option for the Project would require the installation of two pipeline loop segments totaling approximately 131.5 miles of new 36-inch-diameter pipeline. Construction of both these loops would require approximately 1482.4 acres of land disturbance. In addition, the loop-only

alternative would require 399.2 acres of land for operation as permanent pipeline easement, including 151.2 acres of forest and 15.8 acres of wetlands. The loop-only alternative would also cross about 255 waterbodies.

Because this alternative would clearly not provide a significant environmental advantage, the loop-only alternative was not considered further.

Existing Compression Alternative

As an alternative to installing CS 394, we considered the impacts of installing compression facilities and associated suction gas heat exchangers and discharge gas cooling equipment at the location of CS 304, which would allow the discharge pressure to increase to its maximum allowable operating pressure of 858 pounds per square inch gauge and allow an increase in flow to meet the Project requirements. However, instead of installing a Solar Turbines Mars 100 unit (15,900 ISO hp) at the proposed location at CS 394, Natural would need to install a Solar Turbines Titan 130 unit (20,500 ISO hp) at CS 304. Additionally, increasing the discharge pressure at CS 304 could reduce capacity at the various interconnecting meters that could result in a reduction in gas receipts into the Gulf Coast Mainline south of CS 304.

The additional horsepower required would result in greater air emissions and fuel requirements. In addition, Natural states that the alternative could cause a reduction in gas receipts and a lack of general system flexibility as compared to installation of CS 394. The alternative would have a slightly greater construction impact (about 1 acre), but would eliminate impacts on forests. Although the existing compression alternative could eliminate some impacts of the Project, we conclude that the increase in emissions would mean that it would not provide a significant environmental advantage and therefore did not consider it further.

Electric Compression Alternative (ECA)

The Electric Compression Alternative would require the installation of a 3.4-mile-long 69 kilovolt electric transmission line by Southwestern Electric Power Company (SWEPCO). For the purposes of comparing impacts it was assumed that the electric transmission line would require a 100-foot-wide right-of-way for both construction and operation. This would require substantially greater land disturbance (about 41.5 more acres) and greater forest clearing (about 9 more acres) and wetland impacts (about 0.4 more acres).

Although the electric motor driven compression alternative would result in zero emissions associated with gas compression at the station, emissions would increase at the power plants that generate electricity that is delivered into the SWEPCO transmission system. According to the SWEPCO website, in 2015, the

SWEPCO resource mix was comprised of 46% coal/lignite and 37% natural gas. Although it is not possible to determine the exact source of the emissions that would be associated with the power generated to drive the electric motors, there is the potential that the electric compression option could result in higher air emissions than the proposed gas-fired turbine driven compression.

Because it is clear that the electric motor driven compression alternative would not provide a significant environmental advantage over the proposed action, we did not consider it further.

C.3 Site Alternatives

A site alternatives analysis was conducted to determine if a site with fewer environmental impacts that also met the engineering requirements of the Project was available. Figure 2 identifies the location of the site alternatives.

Alternative Site 1

Alternative Site 1 is located approximately 0.53 mile southwest of the Proposed Site, and approximately 0.33 mile northwest from the intersection of FM 251 and County Road 4225. Alternative Site 1 would require 2,533 feet of additional pipe for a lateral to the Amarillo to Gulf Coast Pipeline, resulting in greater land disturbance. Alternative Site 1 would directly affect more landowners than the Proposed Site, due to the increased length of the associated pipeline lateral. The location of Alternative Site 1 would require the associated pipeline lateral to cross a major waterbody (Black Bayou) and large forested wetland complex utilizing a horizontal direction drill for approximately 1,500 feet to avoid and or minimize impacts on this complex. In addition, the proposed access road for this site would require permanent impacts on two unnamed tributaries of Black Bayou.

Because Alternative Site 1 would increase the length of the pipeline lateral, cross a major waterbody and wetland complex, and result in greater land disturbance, we conclude that it would not provide a significant environmental advantage over the proposed action and do not consider it further.

Alternative Site 2

Alternative Site 2 is located approximately 1.3 miles northeast of the Proposed Site, and 0.12 mile southeast from the intersection of State Highway 77 (Pinecrest Drive) and Oakwood Trail. This site is located adjacent to Natural's existing Gulf Cost Mainlines #1 and #2 and would require less land impacts for construction and operation compared to the Proposed Site, partially due to the minimal length of associated piping. However, there is a residence located within 15

feet of the Alternative Site 2 fence line. In addition to this residence, a neighborhood is located directly across State Highway 77, less than 500 feet from the Alternative Site 2 fence line. Due to the proximity of noise sensitive areas (residences) from the Alternative Site 2 fence line, we conclude that the alternative would not provide a significant environmental advantage over the proposed action and do not consider it further..

Alternative Site 3

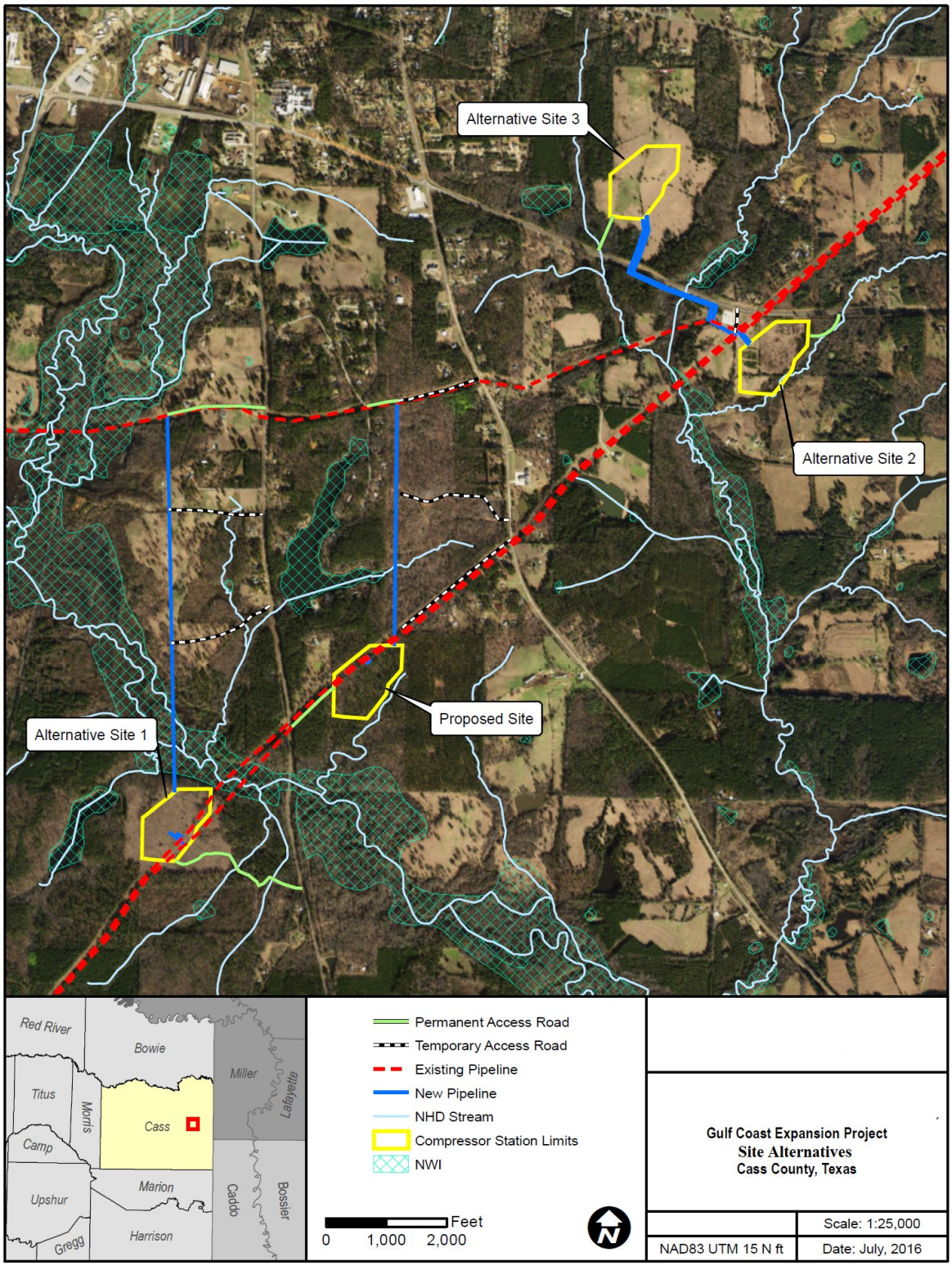
Alternative Site 3 is located 1.5 miles northeast from the Proposed Site and 0.44 mile northwest from the intersection of State Highway 77 (Pinecrest Drive) and Oakwood Trail. Alternative Site 3 would be located predominantly in open land; however, a larger construction footprint would be required due to the greater overall length of pipeline required for pipelines. The necessary pipelines include two 30-inch-diameter suction and discharge pipelines from the compressor station location to Natural's existing Gulf Coast Mainlines #1 and #2 in order to achieve the required bi-directional compression services on the Gulf Coast System; and one 30-inch-diameter bi-directional pipeline to the Amarillo to Gulf Coast Pipeline . The Alternative Site 3 location would require multiple crossings of State Highway 77, a minor waterbody (Hurricane Creek), and would directly impact multiple landowners. Station operational logistics would be constrained due to the distance of the station from Natural's existing Gulf Coast Mainlines and associated side-gate valves. Additionally, Alternative Site 3 is located near a greater number of noise sensitive areas than the Proposed Site. Based on these considerations, we conclude that the alternative would not provide a significant environmental advantage over the proposed action and do not consider it further.

C.4 Conclusion

We reviewed alternatives to Natural'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.

Natural would be abandoning in place two 2,800 hp compressor units (units 5 and 6) at its existing CS 301. These units have not operated since 2006. We did not consider an alternative to the abandonment of these units since the impacts to the resources would be insignificant or negligible (minimal localized ground disturbance in previously disturbed areas to cut pipe and disconnect the abandoned units).

Figure 4 – Site Alternatives



SECTION D – STAFF CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis in this EA, we have determined that if Natural 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 Natural.

1. Natural Gas Pipeline Company of America LLC (Natural) shall follow the construction procedures and mitigation measures described in its application and supplements (including responses to staff data requests) and as identified in the EA, unless modified by the Order. Natural must:
    a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
    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 has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during the construction and operation activities of the project. This authority shall allow:
    a. the modification of conditions of the Order; and
    b. the design and implementation of any additional measures deemed necessary (including stop-work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from project construction and operation.
3. **Prior to any construction**, Natural shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI 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**, Natural shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

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

5. Natural shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying any facility relocations, 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 the FERC's *Upland Erosion Control, Revegetation and Maintenance* 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 the authorization and before construction begins,** Natural shall file an Implementation Plan with the Secretary for review and written approval by the Director of the OEP. Natural must file revisions to the plan as schedules change. The plan shall identify:

   a. how Natural 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 Natural 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 instructions Natural will 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 Natural's organization having responsibility for compliance;

   g. the procedures (including use of contract penalties) Natural will follow if noncompliance occurs; and

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

      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. Natural shall employ at least one EI for the Project. The EI shall be:

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

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

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

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

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

f. responsible for maintaining status reports.

8. Beginning with the filing of its Implementation Plan, Natural 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 Natural's efforts to obtain the necessary federal authorizations;

b. the construction status of the project, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally-sensitive areas;

c. a listing of all problems encountered and each instance of noncompliance observed by the EI 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 Natural from other federal, state, or local permitting agencies concerning instances of noncompliance, and Natural's response.

9. **Prior to receiving written authorization from the Director of the OEP to commence construction of any project facilities,** Natural shall file with the Secretary documentation that it has received all applicable authorizations required under federal law (or evidence of waiver thereof).

10. Natural must receive written authorization from the Director of OEP **before placing the project into service**. Such authorization will only be granted following a determination that rehabilitation and restoration of the areas affected by the project are proceeding satisfactorily.

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

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

    b. identifying which of the Certificate conditions Natural has complied with or would 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. Natural shall file noise surveys with the Secretary **no later than 60 days** after placing the Compressor Station 394 in service. If a full load condition noise survey is not possible, Natural 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 the equipment at Compressor Station 394, under interim or full horsepower load conditions, exceeds an L_{dn} of 55 dBA at any nearby noise sensitive areas, Natural 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. Natural 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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SECTION F – LIST OF PREPARERS

Anis, Shahid – Environmental Project Manager – Introduction, Land Use, Recreation and Visual Resources, Air Quality and Noise, Reliability and Safety, Alternatives and Cumulative Impacts

M.S., Energy, Resources & Environment, George Washington University, 1977
B.S., Mechanical Engineering, University of Maryland, 1974

Boroa, Laurie – Cultural Resources

B.A., Anthropology/Archaeology, queens College, City University of New York

Jernigan, Anthony – Geology, Soils

B.A., Geophysical Sciences, 1995, The University of Chicago

Zielinksi, Jennifer – Water Resources, Fish, Wildlife, and Vegetation

M.S., Environmental Policy, 2015, George Washington University
B.S., Environmental Science, 2010, University of Delaware

Appendix A - Site-Specific Exceptions to the FERC Plan and Procedures						
Workspace ID	**Milepost**	**Stream or Wetland**	**Section of Plan and Procedures**	**Deviations to FERC Plan and Procedures**	**Justification**	**Equal Compliance Measures**
2	0.06	SP1CA009	Procedures Section V.B.2.a.	<50 feet from Stream	ATWS necessary for crossing two of Natural's existing natural gas pipelines.	Maintain greater than 10-foot buffer between ATWS and stream and install temporary erosion and sediment control devices along the edge of the construction ROW as necessary to prevent the flow of spoil or heavily silt-laden water into any stream.
3	0.22	WP1CA002_PEM; SP1CA010	Procedures Sections V.B.2.a and VI.B.1.a.	<50 feet from Wetland; ATWS in stream	ATWS necessary to accommodate spoil storage for wetland crossing.	Maintain 10-foot buffer between ATWS and stream and wetland and install temporary erosion and sediment control devices along the edge of the construction ROW as necessary to prevent the flow of spoil or heavily silt-laden water into any stream/wetland; equipment bridges to be designed and maintained to prevent spoil from entering the stream; timber mats would be used to cover the stream and reduce impact.
4	0.22	WP1CA002_PSS	Procedures Section VI.B.1.a.	<50 feet from Wetland	ATWS necessary to accommodate spoil storage for wetland crossing.	Maintain greater than 10-foot buffer between ATWS and wetland; install temporary erosion and sediment control devices along the edge of the construction corridor as necessary to prevent the flow of spoil or heavily silt-laden water into any wetland.
8	0.39	SP1CA013	Procedures Section V.B.2.a.	<50 feet from Stream	ATWS necessary to accommodate spoil storage for two stream crossings.	Maintain greater than 10-foot buffer between ATWS and stream and install temporary erosion and sediment control devices along the edge of the construction ROW as necessary to

Appendix A - Site-Specific Exceptions to the FERC Plan and Procedures						
Workspace ID	**Milepost**	**Stream or Wetland**	**Section of Plan and Procedures**	**Deviations to FERC Plan and Procedures**	**Justification**	**Equal Compliance Measures**
						prevent the flow of spoil or heavily silt-laden water into any stream.
12	0.64	WP1CA004	Procedures Section VI.B.1.a.	<50 feet from Wetland	ATWS necessary to accommodate spoil storage for wetland crossing.	Maintain greater than 10-foot buffer between ATWS and wetland and install temporary erosion and sediment control devices along the edge of the construction ROW as necessary to prevent the flow of spoil or heavily silt-laden water into any wetland.
15	0.68	WP1CA003	Procedures Section VI.B.1.a.	<50 feet from Wetland	ATWS necessary to accommodate spoil storage for wetland crossing.	Maintain 10-foot buffer between ATWS and wetland; install temporary erosion and sediment control devices along the edge of the construction ROW as necessary to prevent the flow of spoil or heavily silt-laden water into any wetland.
17	Access Road 5 (0.77)	WP1CA006; SP1CA016	Procedures Sections V.B.2.a and VI.B.1.a.	ATWS in wetland and stream	ATWS necessary to accommodate safe turning of large equipment onto the access road from the public road.	Timber mats would be used to cover the stream/wetland and reduce impacts associated with vehicle crossings.
18	Access Road 5 (0.77)	SP1CA016	Procedures Section V.B.2.a.	<50 feet from Stream	ATWS necessary to accommodate safe turning of large equipment onto the access road from the public road.	Timber mats would be used to cover the stream and reduce impacts associated with vehicle crossings.

Appendix B - Summary of Soils within the Gulf Coast Expansion Project Area													
Map Unit Name	**Map Unit Symbol [a]**	**Approx. Milepost**	**Pipeline Crossing Length (feet) / Impact Acreage [b]**	**Prime Farmland [a]**	**Hydric Soils [a]**	**Soil Rutting Hazard [a]**	**Compaction Potential [c]**	**K Factor [a]**	**Erosion Potential [d]**	**Steep Slopes [e]**	**Shallow Bedrock [f]**	**Shrink-Swell Potential [h, i]**	**Revegetation Potential**
Pipeline Facilities													
Bowie fine sandy loam, 1 to 5 percent slopes	BoC	0.15 - 0.22	372	Yes	No	Low	Moderate	.28	Moderate	No	No	N/A	High
Cuthbert gravelly fine sandy loam, 5 to 15 percent slopes [g]	CuE	0.22-0.31; 0.57 - 0.65; 0.68 - 0.72	1,166	No	No	Moderate	Moderate	.20	High	Yes	Yes	N/A	Moderate
Lulus fine sandy loam, 0 to 1 percent slopes, frequently flooded	lu	0.65 - 0.68	132	No	Yes	Moderate	Moderate	.24	Low	No	No	N/A	Moderate
Kirvin gravelly fine sandy loam, 1 to 5 percent slopes [g]	KiC	0.00 - 0.15; 0.72 - 0.77	1,044	No	No	Moderate	Low	.15	Low	No	Yes	N/A	Moderate
Kirvin soils, graded, 2 to 8 percent slopes	KiD	0.37 - 0.57	1,049	No	No	High	Low	.32	Low	No	Yes	N/A	Moderate
Sailes fine sandy loam, 1 to 5 percent slopes	SlC	0.31 - 0.37	316	Yes	No	Moderate	Low	.28	Low	No	No	N/A	High
Aboveground Facilities													
Compressor Station 394													
Cuthbert fine sandy loam, 5 to 15 percent slopes [g]	CtE	N/A	2.24	No	No	Moderate	Moderate	.37	High	Yes	Yes	Moderate	Moderate

Cuthbert gravelly fine sandy loam, 5 to 15 percent slopes [g]	CuE	N/A	11.13	No	No	Moderate	Moderate	.20	High	Yes	Yes	Moderate	Moderate
Kirvin gravelly fine sandy loam, 1 to 5 percent slopes [g]	KiC	N/A	8.15	No	No	Moderate	Low	.15	Low	No	Yes	Moderate	Moderate
A/G Tie-in Facility													
Kirvin gravelly fine sandy loam, 1 to 5 percent slopes [g]	KiC	N/A	0.29	No	No	Moderate	Low	.15	Low	No	Yes	Moderate	Moderate

[a] As designated by the Natural Resources Conservation Service. [b] Represents total length (in feet) crossed by the pipeline lateral or acres of impacts associated with construction of the aboveground facilities. [c] Compaction Potential – Based on soil rutting hazard: Low (slight), Moderate (moderate), High (severe), and hydric designation (yes, no). [d] Erosion Potential – Based on land capability class and subclass: High (Ve-VIIIe); Moderate (IIIe-IVe); and Low (remaining subclasses). [e] Steep Slopes – Represents soils with slopes greater than 8 percent. [f] Shallow Bedrock – Represents soils with consolidated rock 60 inches or less from the surface. [g] Rock fragments greater than 3 inches are present. [h] Shrink-swell potential is the relative change in volume to be expected with changes in moisture content, measured as the linear extensibility percent ("LEP"): Low (<3.0); Moderate (3.0-5.9); High (6.0-8.9); Very High (≥9.0) (NRCS, 2016).

[l] Shrink-swell potential is only reported for soils occurring within the aboveground facility sites, shrink-swell soils can cause damage to concrete slabs, foundations, and other confining structures if drainage is not properly managed.

Appendix C - Surface Waterbodies Crossed or Otherwise Affected by the Gulf Coast Expansion Project								
Milepost/ Access Road ID	**Feature ID**	**Waterbody Name**	**State Water Quality Classification a**	**Fisheries Classification**	**Flow Regime**	**FERC Classification**	**Approximate Waterbody Width (feet)**	**Proposed Crossing Method**
Pipeline Lateral								
0.21	SP1CA010	Unnamed Tributary of Fin and Feather Lake Club	PCR, M	Warmwater	Ephemeral	Minor	2	Workspace only
0.42	SP1CA014	Unnamed Tributary of Fin and Feather Lake Club	PCR, M	Warmwater	Ephemeral	Minor	2	Workspace only
0.43	SP1CA013	Unnamed Tributary of Fin and Feather Lake Club	PCR, M	Warmwater	Ephemeral	Minor	2	Wet open-cut
0.65	SP1CA012	Unnamed Tributary of Fin and Feather Lake Club	PCR, M	Warmwater	Ephemeral	Minor	3	Wet open-cut
Compressor Station 394								
N/A	SP1CA006	Unnamed Tributary of Black Bayou	PCR, M	Warmwater	Ephemeral	Minor	3	Fill (0.03 acre) [b]
N/A	SP1CA005	Unnamed Tributary of Black Bayou	PCR, M	Warmwater	Ephemeral	Minor	2	Fill (0.01 acre) [b]

Appendix C - Surface Waterbodies Crossed or Otherwise Affected by the Gulf Coast Expansion Project								
N/A	SP1CA001	Unnamed Tributary of Black Bayou	PCR, M	Warmwater	Ephemeral	Minor	3	Fill (0.02 acre) [b]
Access Roads								
Access Road 5	SP1CA016	Unnamed Tributary of Fin and Feather Lake Club	PCR, M	Warmwater	Ephemeral	Minor	2	Fill (<0.01 acre) [c]

Notes:
[a] State Water Quality Classifications and Fisheries Classifications were obtained from the Texas Surface Water Quality Standards (Chapter 307).
PCR - primary contact recreation; H - High Aquatic Life Use; M - Minimal Aquatic Life Use
[b] Waterbody would be permanently filled to accommodate construction and operation of proposed CS 394 facility.
[c] Installation of the permanent culvert would permanently impact less than 0.01 acre.

Appendix D - Pipeline Lateral Additional Temporary Workspace Justification					
ATWS ID	**Milepost**	**Dimensions (feet)**		**Justification**	**Land Use**
		Length	**Width**		
1	0.06	150	50	ATWS necessary for crossing two of Natural's existing natural gas pipelines.	Open, Forest
2	0.06	130	50	ATWS necessary for crossing two of Natural's existing natural gas pipelines.	Open, Forest
3	0.22	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open
4	0.22	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open
5	0.29	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open
6	0.29	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open
7	0.39	100	25	ATWS necessary to accommodate spoil storage for two stream crossings.	Open
8	0.39	100	25	ATWS necessary to accommodate spoil storage for two stream crossings.	Open
9	0.47	50	25	ATWS necessary to accommodate safe turning of large equipment onto the access road and to accommodate spoil storage for stream crossing.	Open
10	0.47	100	25	ATWS necessary to accommodate spoil storage for stream crossing.	Open
11	0.49	50	25	ATWS necessary to accommodate safe turning of large equipment onto the access road	Open
12	0.64	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open, Forest
13	0.62	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open
14	0.68	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open, Forest
15	0.68	100	25	ATWS necessary to accommodate spoil storage for wetland crossing.	Open

Appendix D - Pipeline Lateral Additional Temporary Workspace Justification					
ATWS ID	**Milepost**	**Dimensions (feet)**		**Justification**	**Land Use**
		Length	**Width**		
17	0.77 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment onto Access Road 4 from the public road.	Open, Developed
18	0.77 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment onto Access Road 4 from the public road.	Open, Forest, Developed
21	0.47 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment at the temporary Access Road 3 bends.	Open
22	0.47 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment at the temporary Access Road 3 bends.	Open
23	0.44 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment at the temporary Access Road 3 bends.	Open
24	0.44 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment onto the temporary Access Road 3 from the public road.	Open, Developed
25	0.40 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment onto the temporary Access Road 3 from the public road.	Open, Developed
26	0.37 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment onto temporary Access Road 2 from the public road.	Open, Developed
27	0.36 [a]	50	25	ATWS necessary to accommodate safe turning of large equipment onto temporary Access Road 2 from the public road.	Open, Developed
[a] ATWS located along proposed access road; therefore, the approximate milepost presented is associated with the pipeline lateral. [b] ATWS located at CS 394; therefore, the approximate milepost presented is associated with the pipeline lateral.					

Appendix E - Birds of Conservation Concern with potential to occur within the Project a			
Species	**Season Present**	**Preferred Habitat**	**Assessment of Potential Imp**
American Kestrel *Falco sparverius*	Year-round	Occur in open areas such as farmlands and grasslands, forest edges, and urban areas. Nest in cavities in dead trees or snags.	Suitable breeding habitat may present in the Project area; however, clearing would occu outside of the nesting seasor
Bachman's Sparrow *Peucaea aestivalis*	Breeding	Inhabits dry open pine or oak woods that have grasses and shrubs in the understory.Found in hillsides, overgrown fields, grassy orchards, and large clear-cut areas.	Suitable breeding habitat may be present in the Project area however, clearing would occu outside of the nesting season
Bald Eagle *Haliaeetus leucocephalus*	Year-round	Breed and winter in areas close to a coast, river or lake. Prefer conifers for nesting and roosting and tend to avoid areas with high human traffic.	Suitable breeding habitat exist in the Project area in Cass County. Clearing would occur outside of the nesting season and any non- breeding birds would likely disperse to simila adjacent habitats. Additionally, no bald eagle nes were observed in the area during field surveys.
Bell's Vireo *Vireo bellii*	Breeding	Breeds in low dense vegetation, especially second-growth scrub, brushy fields, and streamside thickets.	Suitable breeding habitat may be present in the Project area however, clearing would occu outside of the nesting season
Bewick's Wren *Thryomanes bewickii ssp. bewickii*	Wintering	Prefers brushy areas, scrub, and thickets in open country.	Suitable habitat is not present the Project area.
Brown-headed Nuthatch *Sitta pusilla*	Year-round	Prefers mature, open pine forests. Typically nests in dead tree cavities.	Due to previous clearing of a majority of the Project area, no suitable habitat is present.
Dickcissel *Spiza americana*	Breeding	Breeds in prairies, meadows, and fields of alfalfa, clover timothy, or other crops.	Habitat is not present in the Project area. Suitable h
Fox Sparrow *Passerella iliaca*	Wintering	Winters in wooded areas with brushy undergrowth as well as brushy fields, chaparral, and well-vegetated suburbs.	Suitable wintering habitat may present in the Project area; however, individuals potential present during construction would likely avoid the area o displace to similar adjacent

Appendix E - Birds of Conservation Concern with potential to occur within the Project area			
Harris's Sparrow *Zonotrichia querula*	Wintering	Winters in thickets, woodland edges, brushy fields, and hedgerows.	Suitable wintering habitat may be present in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent
Henslow's Sparrow *Ammodramus henslowii*	Wintering	Prefers to winter in various types of rank weedy fields.	Suitable habitat is not present in the Project area.
Hudsonian Godwit *Limosa haemastica*	Migrating	Migrants may occur on shallow marshy lakes, flooded pastures, and mudflats.	Suitable habitat is not present in the Project area.
Kentucky Warbler *Geothlypis formosa*	Breeding	Breeds in dense, humid woods, bottomlands near creeks and rivers, swamp edges, and ravines in upland deciduous forests.	Due to previous clearing of a majority of the Project area, no suitable habitat is present.
Le Conte's Sparrow *Ammodramus*	Wintering	Winters in damp weedy fields, coastal prairies, and shallow freshwater marshes.	Suitable habitat is not present in the Project area.
Least Bittern *Ixobrychus exilis*	Breeding	Breeds in freshwater or brackish marshes and reedy ponds.	Suitable habitat is not present in the Project area.
Lesser Yellowlegs *Tringa flavipes*	Wintering	Wintering occurs in various habitats such as tidal flats during the dry season and adjacent marshes and shallow lagoons during the rainy season.	Suitable habitat is not present in the Project area.
Little Blue Heron *Egretta caerulea*	Breeding	Breeds in marshes, swamps, rice fields, and ponds.	Suitable habitat is not present in the Project area.
Loggerhead Shrike *Lanius ludovicianus*	Year-round	Occurs in semi-open country with good lookout posts such as trees, wires, and shrubs. Breeds in semi- open areas including large clearings in wooded regions to open grasslands with scattered trees or shrubs.	Suitable habitat is not present in the Project area.
Louisiana Waterthrush *Parkesia motacilla*	Breeding	Breeds in bottomlands and wooded swamps, or near slow to fast-moving streams.	Due to previous clearing of a majority of the Project area, no suitable habitat is present.
Mississippi Kite *Ictinia mississippiensis*	Breeding	Breeds in tall trees near open country, often along rivers or groves near prairies.	Suitable habitat is not present in the Project area.

Appendix E - Birds of Conservation Concern with potential to occur within the Project area			
Orchard Oriole *Icterus spurius*	Breeding	Breeds in semi-open areas with deciduous trees including orchards, suburbs, forest edges and clearings, and prairie groves.	Suitable breeding habitat may be present in the Project area; however, clearing would occur outside of the nesting season.
Painted Bunting *Passerina ciris*	Breeding	Breeds in thickets, hedgerows, forest edges and clearings, and brushy undergrowth of open woods.	Suitable breeding habitat may be present in the Project area; however, clearing would occur outside of the nesting season.
Prairie Warbler *Dendroica discolor*	Breeding	Breeds in dry clearings, brush second growth, forest edges, and sandy pine barrens with scrub oak undergrowth, most commonly on slopes or ridges.	Suitable breeding habitat may be present in the Project area; however, clearing would occur outside of the nesting season.
Prothonotary Warbler *Protonotaria citrea*	Breeding	Breeds in flooded river bottomland hardwoods; borders of lakes, rivers, and ponds in areas with slow-moving or standing water.	Due to previous clearing of a majority of the Project area, no suitable habitat is present.
Red-headed Woodpecker *Melanerpes erythrocephalus*	Year-round	Occurs in open areas such as clearings in woods, forest edges, orchards, and groves of tall trees in open areas.	Suitable breeding habitat may be present in the Project area; however, clearing would occur outside of the nesting season.
Rusty Blackbird *Euphagus carolinus*	Wintering	Winters in areas with trees near water such as wooded swamps and riverside forest.	Suitable wintering habitat may be present in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent
Short-eared Owl *Asio flammeus*	Wintering	Winters in open country including meadows, coastal dunes, and shrubby areas.	Suitable habitat is not present in the Project area.
Swainson's Warbler *Limnothlypis swainsonii*	Breeding	Breeds in swamps and bottomlands.	Due to previous clearing of a majority of the Project area, no suitable habitat is present.
Wood Thrush *Hylocichla mustelina*	Breeding	Breeds in the understory of deciduous or mixed woodlands. Prefers damp woodlands near streams.	Suitable breeding habitat may be present in the Project area; however, clearing would occur outside of the nesting season.
Worm-eating Warbler *Helmitheros vermivorum*	Breeding	Habitats for breeding are found in mature deciduous forests with dense understory.	Suitable habitat is not present in the Project area.

Appendix F State Listed Threatened and Endangered Species Occurring Within Gulf Coast Expansion Area					
Common Name	**Scientific Name**	**State Status**	**Habitat Description**	**Habitat Assessment**	**Determination of Effect**
Mammals					
Black Bear	*Ursus americanus*	T	Prefers bottomland hardwoods and large tracts of undisturbed forested areas.	Due to previous clearing of a majority of the Project area, no suitable habitat is present.	*No effect*
Louisiana Black Bear	*Ursus americanus hiteolus*	T	Prefers bottomland hardwoods and large tracts of undisturbed forested areas.	Due to previous clearing of a majority of the Project area, no suitable habitat is present.	*No effect*
Rafinesque's big-eared bat	*Corynorhimus rafinesquii*	T	Roost in tree cavities in mature bottomland hardwoods, concrete culverts, and abandoned man-made	Due to previous clearing of a majority of the Project area, no suitable habitat is present.	*No effect*
Red Wolf	*Canis rufus*	E	Prefers forested and brushy areas, as well as coastal prairies.	Species is presumed to be extirpated in the Project area.	*No effect*
Mollusks					
Louisiana pigtoe	*Pleurobema riddellii*	T	Inhabits streams and moderate-size rivers, usually flowing water with mud, sand or gravel bottoms. Found in Sabine, Neches, and Trinity River	No suitable habitat is present in the Project area.	*No effect*
Birds					
American Peregrine Falcon	*Falco peregrinus anatum*	T	Occupies predominantly open habitat containing wide views of the surrounding area. Habitat must be in proximity to water and have rocky cliffs or tall buildings or bridges available for nesting.	No suitable habitat is present in the Project area.	*No effect*

Appendix F State Listed Threatened and Endangered Species Occurring Within Gulf Coast Expansion Area					
Bachman's Sparrow	*Aimophila aestivalis*	T	Prefer open pine woods with grassy floor. Utilizes open spaces that are in transition to forest.	Suitable habitat may be present in the Project area; however, clearing would occur outside of the nesting season to avoid impacts on birds potentially nesting in the area. If individuals are present during fall clearing activities, they would likely relocate to adjacent suitable habitat.	*Not likely to adversely affect*
Bald Eagle	*Haliaeetus leucocephalus*	T	Breeds and winters near waterbodies in forested areas with large, super-canopy roost trees that are open and accessible.	Suitable habitat is present within the Project area; however no nests were observed during field surveys. If individuals are present during fall clearing activities, they would likely relocate to	*Not likely to adversely affect*
Least Tern (Interior Population)	*Sterna antillarum*	E	Breeds on sandy or gravelly beaches, found on the coasts of bays, estuaries, lagoons, beaches, lakes, and rivers.	No suitable habitat is present in the Project area.	*No effect*
Peregrine Falcon	*Falco peregrinus*	T	Wintering occurs in habitats with open lands, such as farmland, marshes, lakeshores, river mouths, tidal flats and broad river valleys.	No suitable habitat is present in the Project area.	*No effect*
Piping Plover	*Charadrius melodus*	T	Prefer upland areas adjacent to alkaline wetlands and along tidelines on open sandy beaches.	No suitable habitat is present in the Project area.	*No effect*
Wood Stork	*Mycteria Americana*	T	Utilizes prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater for foraging.	No suitable habitat is present in the Project area.	*No effect*

Appendix F State Listed Threatened and Endangered Species Occurring Within Gulf Coast Expansion Area					
Fish					
Blackside darter	*Percina maculate*	T	Prefers clear, gravelly streams with some current; quiet pools; or pools with swift riffles.	No suitable habitat is present in the Project area.	*No effect*
Bluehead shiner	*Pteronotropis hubbsi*	T	Prefer small to medium sized, quiet, backwater areas; sluggish streams and oxbow lakes having mud or mud-sand bottoms, tannin-stained water with heavy growth of submergent or semi-emergent vegetation.	Only known populations occur in Caddo Lake and Big Cypress Bayou; therefore, no suitable habitat is present in the Project area.	*No effect*
Creek chubsucker	*Erimyzon oblongus*	T	Found in tributaries of the Red, Sabine, Neches, and San Jacinto Rivers; inhabits small rivers and creeks of various types and sometimes impoundments. Spawns in river mouths or pools, riffles, lake outlets, and upstream creeks.	No suitable habitat is present in the Project area.	*No effect*
Paddlefish	*Polyodon spathula*	T	Inhabits large, free-flowing rivers and spawns in fast, shallow water over gravel bars.	No suitable habitat is present in the Project area.	*No effect*
Reptiles					

Appendix F State Listed Threatened and Endangered Species Occurring Within Gulf Coast Expansion Area					
Alligator snapping turtle	*Macrochelys temminckii*	T	Found in perennial waterbodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water and sometimes brackish coastal waters. Prefers water with mud bottom and abundant aquatic vegetation.	Suitable habitat may be present within the Project area; however, based on occurrence data provided by the TXNDD, there are no known occurrences of this species in the Project area. Additionally, this species is mobile and would likely avoid the area during construction.	*Not likely to adversely affect*
Northern scarlet snake	*Cemophora coccinea copei*	T	Habitat consists of mixed hardwood scrub on sandy soils.	Suitable habitat may be present within the Project area; however, based on occurrence data provided by the TXNDD, there are no known occurrences of this species in the Project area. Additionally, this species is mobile and would likely avoid the area during construction.	*Not likely to adversely affect*
Timber rattlesnake	*Crotalus horridus*	T	Found in swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone, bluffs, sandy soil or black clay; prefers dens ground cover.	Suitable habitat may be present within the Project area; however, based on occurrence data provided by the TXNDD, there are no known occurrences of this species in the Project area. Additionally, this species is mobile and would likely avoid the area during construction.	*Not likely to adversely affect*
E = Endangered; T = Threatened; Source: NatureServe, 2016; National Audubon Society, 2016; TPWD, 2016; TXNDD, 2016; Thomas et al., 2007					

Appendix G - Assessment of Seven Plant Species of Greatest Conservation Concern in CASS County					
Common Name	**Scientific Name**	**Habitat Description**	**Habitat Assessment**	**Species Assessment**	**Impact**
Goldenwave tickseed	*Coreopsis intermedia*	Occurs in deep sandy soils of sandhills within openings in or along margins of post oak woodlands and pine-oak forests of East Texas.	The majority of the survey area consists of moderately deep to deep sandy loams or sands. The dominant vegetation in the forested upland area consists of loblolly pine, a variety of oak species such as post, water, turkey, and blackjack, sweetgum, red maple, and eastern red cedar.	Suitable habitat occurs within the Project area; however, no individuals or populations were observed during the environmental survey. All Project related activities would occur within the USGS Atlanta South Quadrangle map. According to information received from the TXNDD, there are no documented occurrences of this species within this particular quad map. Impacts to the species are not expected to occur during Project related activities.	No Impact
Soxman's milkvetch	*Astragalus soxmaniorum*	Occurs primarily in deep sandy soils of sandhills, fallow fields, and open scrub oak-pine woodlands.	The majority of the survey area consists of moderately deep to deep sandy loams or sands. The dominant vegetation in the forested upland area consists of loblolly pine, a variety of oak species such as post, water, turkey, and blackjack, sweetgum, red maple, and eastern red cedar.	Suitable habitat occurs within the Project area; however, no individuals or populations were observed during the environmental survey. All Project related activities would occur within the USGS Atlanta South Quadrangle map. According to information received from the TXNDD, there are no documented occurrences of this species within this particular quad map.	No Impact

Appendix G - Assessment of Seven Plant Species of Greatest Conservation Concern in CASS County					
Common Name	**Scientific Name**	**Habitat Description**	**Habitat Assessment**	**Species Assessment**	**Impact**
Arkansas oak	Quercus arkansana	his species prefers deep sandy soils and is only known to occur within Cass County at a single location consisting of a young pine plantation interspersed with oak species such as Quercus stellata, Q. marilandica and Q. incana.	the majority of the survey area consists of moderately deep to deep sandy loams or sands. The dominant vegetation in the forested upland area consists of loblolly pine, a variety of oak species such as post, water, turkey, and blackjack, sweetgum, red maple, and eastern red cedar.	Suitable habitat occurs within the Project area; however, no individuals or populations were observed during the environmental survey. All Project related activities would occur within the USGS Atlanta South Quadrangle map. According to information received from the TXNDD, there are no documented occurrences of this species within this particular quad map.	No Impact
Panicled indigobush	Amorpha paniculata	A stout shrub, 3 m (9 ft) tall that grows in acidic forest seeps, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas.	The majority of the survey area consists of moderately deep to deep sandy loams or sands. The dominant vegetation in the forested upland area consists of loblolly pine, a variety of oak species such as post, water, turkey, and blackjack, sweetgum, red maple, and eastern red cedar.	Suitable habitat consisting of acidic forest seeps, peat bogs, wet floodplains, and seasonal wetlands do not occur within the Project footprint.	No Impact

Appendix G - Assessment of Seven Plant Species of Greatest Conservation Concern in CASS County					
Common Name	**Scientific Name**	**Habitat Description**	**Habitat Assessment**	**Species Assessment**	**Impact**
xon's dwarf hawthorn	Crataegus nananixonii	Found in open upland post oak-bluejack oak, scrubby woodland, or shortleaf pine-oak woodland on the Carrizo Sands and other formations.	The majority of the survey area consists of moderately deep to deep sandy loams or sands. The dominant vegetation in the forested upland area consists of loblolly pine, a variety of oak species such as post, water, turkey, and blackjack, sweetgum, red maple, and eastern red cedar.	The Project is situated within a mixed loblolly pine-hardwood forest. Forests dominated by post oak-bluejack oak, shortleaf pine-oak, or scrubby woodland are not present within the vicinity of the Project.	No Impact
Texas trillium	*Trillium texanum*	Occurs in or along the margins of hardwood forests on wet acid soils of bottoms and lower slopes, strongly associated with forested seeps and baygalls.	The majority of the survey area consists of moderately deep to deep sandy loams or sands. The dominant vegetation in the forested upland area consists of loblolly pine, a variety of oak species such as post, water, turkey, and blackjack, sweetgum, red maple, and eastern red cedar.	Suitable habitat consisting of forested seeps and baygalls containing acidic soils are not present within the Project footprint.	No Impact
Texas ladies'-tresses	*Spiranthes brevilabris var. brevilabris*	Occurs primarily within burned pine savannas and flatwoods, as well as roadsides and cemeteries.	The majority of the survey area consists of moderately deep to deep sandy loams or sands. The dominant vegetation in the forested upland area consists of loblolly pine, a variety of oak species such as post, water, turkey, and blackjack, sweetgum, red maple, and eastern red cedar.	Suitable habitat consisting of pine savannah and flatwood habitats is not located within the Project footprint. Additionally cemeteries and roadsides would not be impacted by the Project.	No Impact

Appendix G - Assessment of Seven Plant Species of Greatest Conservation Concern in CASS County					
Common Name	**Scientific Name**	**Habitat Description**	**Habitat Assessment**	**Species Assessment**	**Impact**

References:
http://tpwd.texas.gov/gis/rtest/
Texas Natural Diversity Database (TXNDD) 2016. http://tpwd.texas.gov/huntwild/wild/wildlife_diversity/txndd/
U.S. Geologic Survey Atlanta South Quadrangle Map. 1969.

Appendix H – Potential Emission Rates Associated With Compressor Station 394								
Emission Source	**NO_x**	**CO**	**VOC**	**SO_2**	**$PM_{2.5}$ / PM_{10}**	**Formaldehyde**	**Total HAP**	**GHG (CO_2e)**
Average Hourly Emissions (lb/hr)								
Turbine #1 Solar Turbines Mars 100	7.66	7.78	0.89	0.433	0.84	0.31	0.33	14,930
Emergency Generator	6.47	12.95	3.24	0.006	0.10	0.53	0.72	1,175
Fuel Gas Heater	0.08	0.07	0.005	5.0E-04	0.006	6.3E-05	6.8E-05	99
Storage Tanks	NA	NA	0.03	NA	NA	NA	NA	NA
Condensate Loading	NA	NA	0.03	NA	NA	NA	NA	NA
Equipment Leaks	NA	NA	0.015	NA	NA	NA	NA	17
Natural Gas Venting	NA	NA	1.13	NA	NA	NA	NA	1,336
Turbine Startup/Shutdown	1.8E-05	0.002	1.8E-05	NA	NA	NA	NA	0
Facility-Wide Totals	**14.22**	**20.80**	**5.34**	**0.44**	**0.95**	**0.84**	**1.05**	**17,558**
Annual Potential Emissions (tpy)								
Turbine #1 Solar Turbines Mars 100	33.56	34.06	3.90	1.90	3.69	1.35	1.44	65,394
Emergency Generator	1.62	3.24	0.81	0.001	0.025	0.13	0.18	294
Fuel Gas Heater	0.37	0.31	0.020	2.2E-03	0.028	2.7E-04	3.0E-04	436
Storage Tanks	NA	NA	0.15	NA	NA	NA	NA	NA
Condensate Loading	NA	NA	0.14	NA	NA	NA	NA	NA
Equipment Leaks	NA	NA	0.06	NA	NA	NA	NA	76
Natural Gas Venting	NA	NA	4.93	NA	NA	NA	NA	5,852
Turbine Startup/Shutdown	0.16	13.64	0.16	NA	NA	NA	NA	0
Facility-Wide Totals	**35.70**	**51.24**	**10.16**	**1.90**	**3.74**	**1.48**	**1.62**	**72,051**
Permitting Requirement Thresholds								
PSD Major Source Thresholds [a]	*250*	*250*	*250*	*250*	*250*	*N/A*	*N/A*	*100,000* [c]
Title V Major Source Thresholds [b]	*100*	*100*	*100*	*100*	*100*	*10*	*25*	*100,000* [c]
Texas Permit Thresholds [d]	*<250*	*<250*	*<25*	*<25*	*<15 (PM_{10})* *<10 ($PM_{2.5}$)*	*<25*	*<25*	*N/A*

Appendix H – Potential Emission Rates Associated With Compressor Station 394								
Emission Source	**NO_x**	**CO**	**VOC**	**SO_2**	**$PM_{2.5}$ / PM_{10}**	**Formaldehyde**	**Total HAP**	**GHG (CO_2e)**
[a] The PSD major source thresholds were obtained from 40 C.F.R. 52.21(b)(1)(b) for areas in attainment of the NAAQS. HAP emissions are not covered by the PSD permitting program. [b] The Title V major source thresholds were obtained from 40 C.F.R. 70.2 for areas in attainment of the NAAQS. [c] Projects that are not subject to NSR/PSD review for a non-GHG pollutant are not subject to PSD review for GHG. [d] The facility-wide Texas Permit-by-Rule thresholds are taken from 30 TAC § 106.4(a)(4). Facilities with emissions greater than the Permit-by-Rule thresholds are required to obtain a Pre-Construction Permit pursuant to 30 TAC Chapter 116.								

Appendix I - Compressor Station 394 Model Input Parameters														
Source Description	Model ID	Type	Location (UTM)			Modeled Exhaust Parameters				Modeled Emission Rates (g/s)				
			X (m)	Y (m)	Z (m msl)	Height (m)	Temp (K) σ_{y0} (m)	Velocity (m/s) σ_{z0} (m)	Diameter (m)	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
Turbine #1 Solar Turbines Mars 100	TURBIN1	POINT	391794	3660587	84.44	15.24	730.37	17.23	2.67	0.9803	0.9652	0.1060	0.1060	0.0546
Emergency Generator	EMGEN	POINT	391796	3660533	83.82	9.14	802.04	58.14	0.31	1.6311	0.0466	0.0126	0.0126	0.0007
Fuel Gas Heater	FGHEATR	VOLUME	391804	3660602	84.44	4.57	1.14	2.12	--	0.0088	0.0101	0.0008	0.0008	0.00006
σ_{y0} – initial sigma y value; σ_{z0} – initial sigma z value; g/s – grams per second; msl – mean sea level														

Appendix J - Dispersion Modeling Results for Compressor Station 394						
Pollutant	**Averaging Period**	**Rank**	**Modeled Concentration (µg/m3)**	**Background Concentration (µg/m3)**	**Aggregate Concentration (µg/m3)**	**NAAQS (µg/m3)**
CO	1-hour	H2H	90.4	607	697.4	40,000
	8-hour	H2H	70.5	309	379.5	10,000
NO2	1-hour	H8H	17.6	35.92	53.5	188
	Annual	H1H	0.77	1.45		100
PM2.5	24-hour	H8H	0.35	19.33	19.7	35
	Annual	H1H	0.09	9.03	9.12	12
PM10	24-hour	H1H	0.61	40.33	40.9	150
SO2	1-hour	H4H	0.72	119.6	120.3	196
	3-hour[1]	H2H	0.59	119.6	120.2	1,300
	24-hour	H2H	0.25	17.05	17.3	3652
	Annual	H1H	0.016	1.98	2.0	802

H2H = highest second high value
H8H = Highest 8th high, equivalent to 98th percentile
H1H = Highest value
H4H = Highest 4th high, equivalent to 99th percentile

1: assumed background same as 1-hr
2: NAAQS revoked, included as information only.

Appendix K – Other Projects Potentially Contributing To Cumulative Impacts					
Project Name	**Description**	**County/Parish, State**	**Estimated Construction Date**	**Location Relative to the Proposed Project**	**Resource Area Cumulatively Affected[a]**
New Project Facilities					
Electric service from local utility provider for CS 394	Utility service would be routed approximately 960 feet to the NE from FM 251 S (located W of CS 394 along the utility and access easement (Permanent Access Road # 1).	Cass County, Texas	Concurrent with Project Schedule	Powerline would be adjacent to the proposed Permanent Access Road # 1 within the Project's proposed workspace	N/A
Texas DOT Road Widening Project	Expanding State Highway 77 for 1.08 miles, from a 2 lane road to 4 lane road between FM 251 and FM 1841.	Cass County, Texas	Current – 2nd quarter 2017	0.67 mile north	Wildlife; Vegetation
International Paper Company	NCG Oxidation Unit	Cass County, Texas	Mid 2016 - Mid 2017	20 km north-northeast	Air
Linn Operating, Inc.	Brooks 01D SWD	Cass County, Texas	Mid 2016 - Mid 2017	40 km southwest	Air
Tyson Poultry	Tyson Poultry	Miller County, Arkansas	Mid 2016 - Mid 2017	45 km north-northeast	Air
[a] Only resources in which a cumulative impact may occur are identified below.					

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