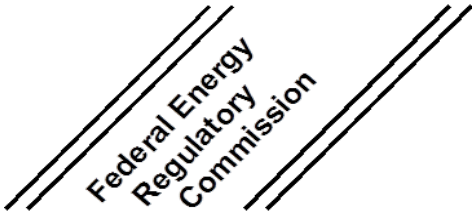

Office of Energy Projects

March 2019

Natural Gas Pipeline Company of America, LLC **Docket No. CP18-487-000**

Sabine Pass Compression Project

Environmental Assessment

Washington, DC 20426

SABINE PASS COMPRESSION PROJECT
ENVIRONMENTAL ASSESSMENT
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TECHNICAL ABBREVIATIONS AND ACRONYMS

AQCR	Air Quality Control Region
BMPs	best management practices
CAA	Clean Air Act
CEQ	Council on Environmental Quality
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
Commission	Federal Energy Regulatory Commission
CS 348	Compressor Station No. 348
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibels
dBA	A-weighted decibels
DOT	U.S. Department of Transportation
Dth/d	dekatherms per day
EA	environmental assessment
ECD	temporary erosion control devices
EI	environmental inspector
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gases
HAPs	hazardous air pollutants
HCD	Habitat Conservation Division
hp	horsepower
KMLP	Kinder Morgan Louisiana Pipeline LLC
L_{dn}	day-night sound level
LDNR	Louisiana Department of Natural Resources
LDWF	State of Louisiana Department of Wildlife and Fisheries
L_{eq}	24-hour equivalent sound level
LNG	natural gas liquefaction
MBTA	Migratory Bird Treaty Act
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act of 1969 (as amended)
NGA	Natural Gas Act
NOI	*Notice of Intent to Prepare an Environmental Assessment for the Sabine Pass Compression Project*
NO_2	nitrous dioxide
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conversation Service
NRHP	National Register of Historic Places
NMFS	National Marine Fisheries Service
NSA	noise sensitive area

NSR	New Source Review
NWR	National Wildlife Refuge
O_3	ozone
OCM	Office of Coastal Management
OEP	Office of Energy Projects
Plan	FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan*
PM10	particulate matter less than 10 microns in diameter
PM2.5	particulate matter less than 2.5 microns in diameter
Procedures	FERC's *Wetland and Waterbody Construction and Mitigation Procedures*
Project	Sabine Pass Compression Project
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
SHPO	State Historic Preservation Office
SIL	significant impact level
SO2	sulfur dioxide
SPL	Sabine Pass Liquefaction, LLC
tpy	tons per year
USACE	United States Army Corps. of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compound

SECTION A – PROPOSED ACTION

A.1 Introduction

The staff of the Federal Energy Regulatory Commission (FERC or Commission) has prepared an environmental assessment (EA) to assess the impacts of constructing and operating certain natural gas transmission pipeline and associated facilities proposed by Natural Gas Pipeline Company of America, LLC (Natural). Natural filed an application on May 18, 2018 in Docket No. CP18-487-000, pursuant to section 7(c) of the Natural Gas Act (NGA), and Part 157 of the Commission's regulations for a Certificate of Public Convenience and Necessity (Certificate) to construct, install, operate, and maintain certain natural gas transmission facilities to be located in Cameron Parish, Louisiana. Specifically, Natural is seeking authorization for the Sabine Pass Compression Project (Project), which would enable Natural to provide 400,000 dekatherms per day (Dth/d) (about 400 million cubic feet) of natural gas on a firm basis to Sabine Pass Liquefaction, LLC's (SPL) natural gas liquefaction (LNG) export facility in Cameron Parish, Louisiana (SPL Terminal).

We[1] prepared this EA in compliance with the requirements of the National Environmental Policy Act (NEPA); the Council on Environmental Quality's (CEQ) regulations for implementing the NEPA (Title 40 Code of Federal Regulations [CFR], Parts 1500-1508); and the Commission's regulations at 18 CFR 380. 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, and identify and recommend reasonable alternatives and specific mitigation measures, as necessary, to avoid or minimize project-related environmental impacts.

The EA is an integral part of the Commission's decision-making process in determining whether to authorize Natural's proposal.

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. Approval would be granted if, after consideration of both environmental and non-environmental issues, the Commission finds that the Project is in the public interest.

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

Natural states that the purpose of the Project is to allow it to transport an additional 400,000 Dth/d of natural gas at a minimum pressure of 1,050 pounds per square inch gauge (psig) under firm transportation service agreements to the SPL Terminal.

A.3 Proposed Facilities

Natural proposes to construct and operate the following facilities in Cameron Parish, Louisiana as identified in table 1 by milepost. Figure 1 shows the overview general location of the Project facilities. Figure 2 provides the location of the proposed site of Compressor Station (CS) 348 from the Gulf of Mexico. Figure 3 indicates the location of CS 348 from the existing Kinder Morgan Louisiana Pipeline LLC (KMLP) Platform. Figure 4 outlines the location of CS 348, Tie-in Facility and Access Roads 1-4.

Table 1 Summary of Project Facilities

Facility	Natural Pipeline and Milepost (MP) Location	Description
Compressor Station 348	MP 91 – Existing Louisiana Line Nos. 1 and 2	Construct a new gas-fired compressor station facility with a 22,490 horsepower ISO Solar Titan 130 turbine and necessary auxiliary equipment on a new elevated platform.
Tie-in Facility	MP 91 – Existing Louisiana Line Nos. 1 and 2	Construct 1,573 feet (343 feet above ground and 1,230 feet below ground) 36-inch-diameter suction and discharge pipelines and interconnection from Compressor Station 348 to the existing Louisiana Lines Nos. 1 and 2 existing Natural lateral.
X-L8E South Valve	MP 154 – Existing Louisiana Line Nos. 1 and 2	Install modifications to allow for remote operation of Natural's existing valve.

Figure 1. Sabine Pass Compression Project – Location Overview Map

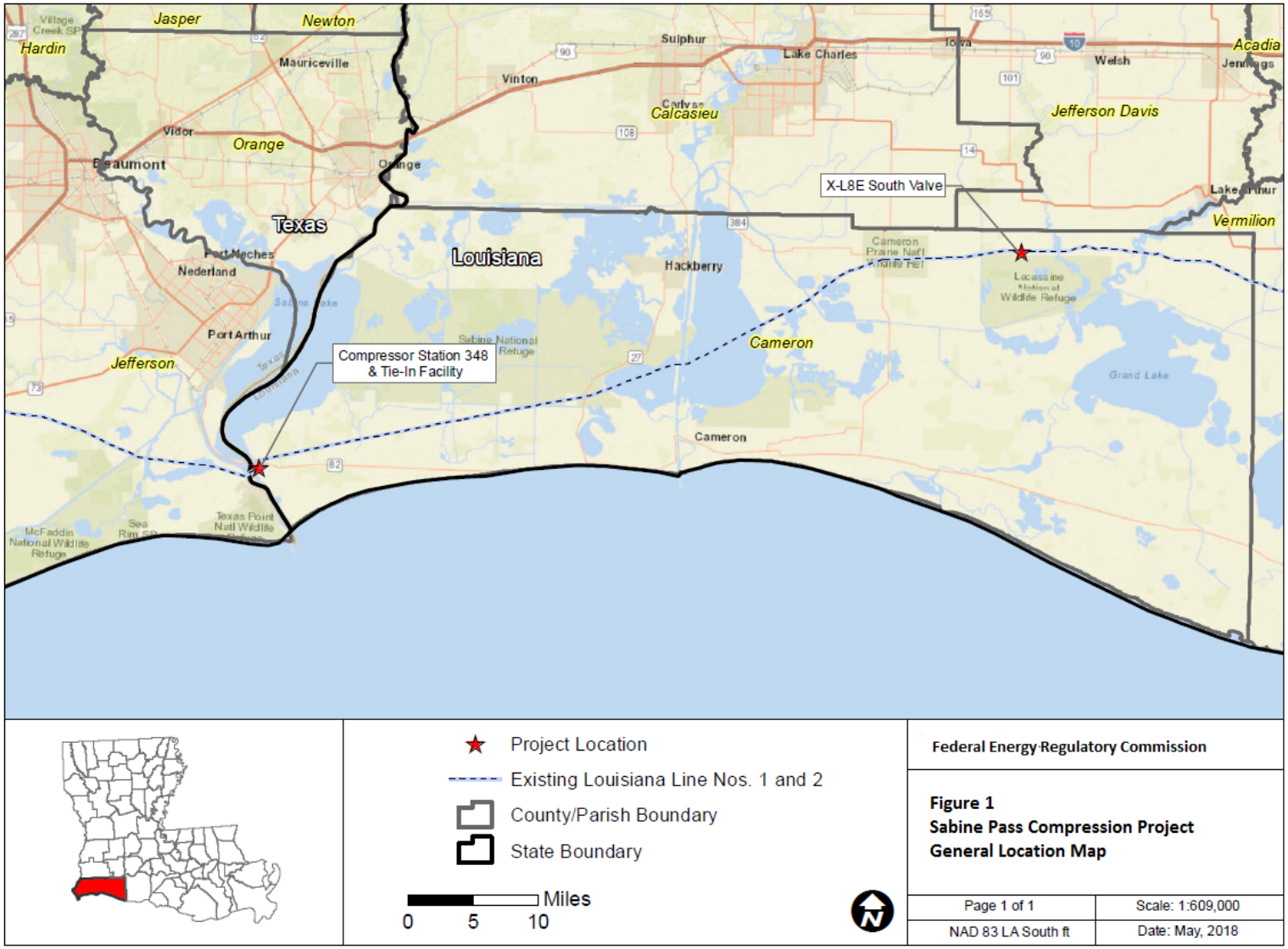


Figure 2 Location of CS 348 from the Gulf of Mexico

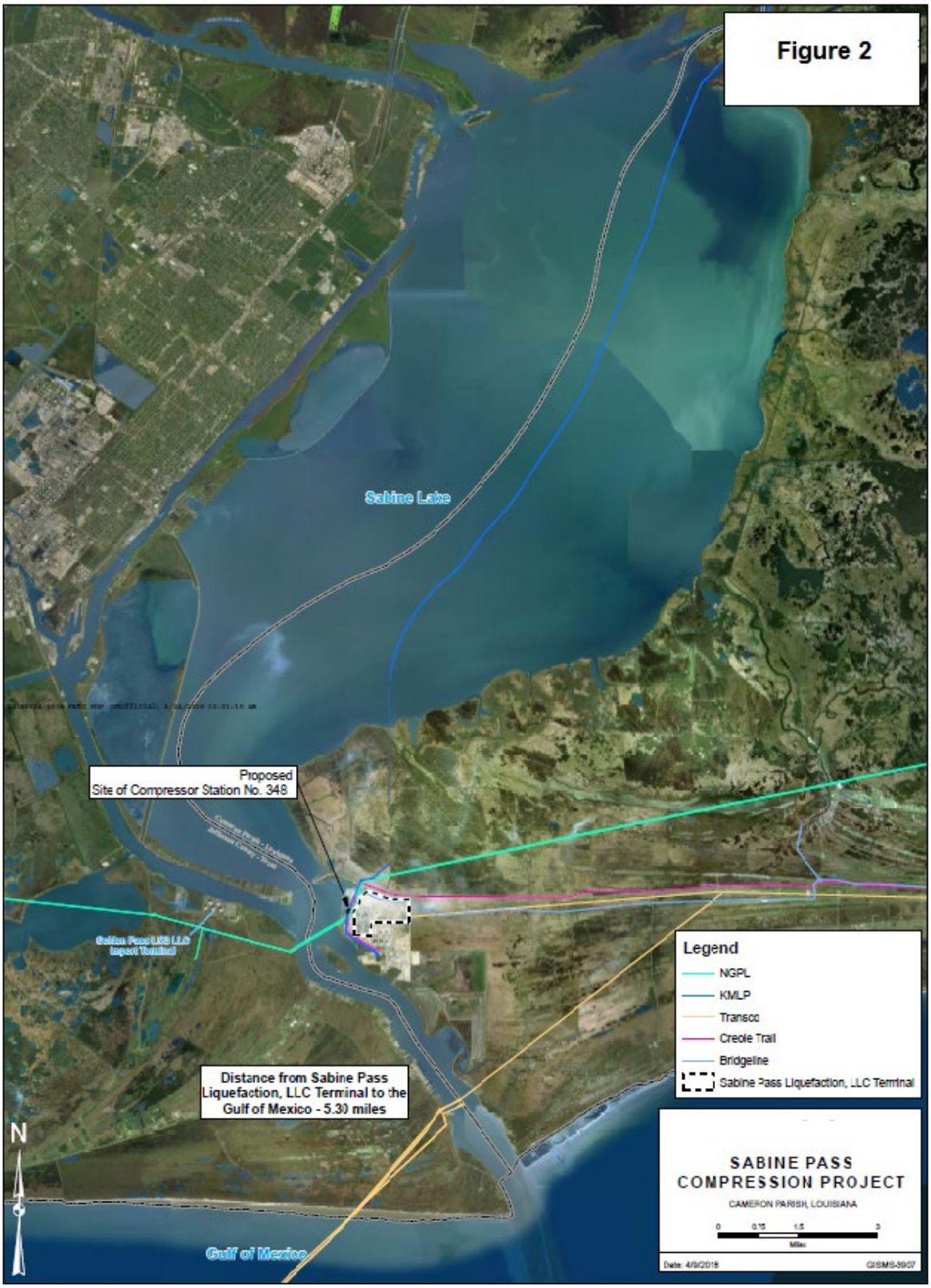


Figure 3 Location of CS 348 from the KMLP Platform

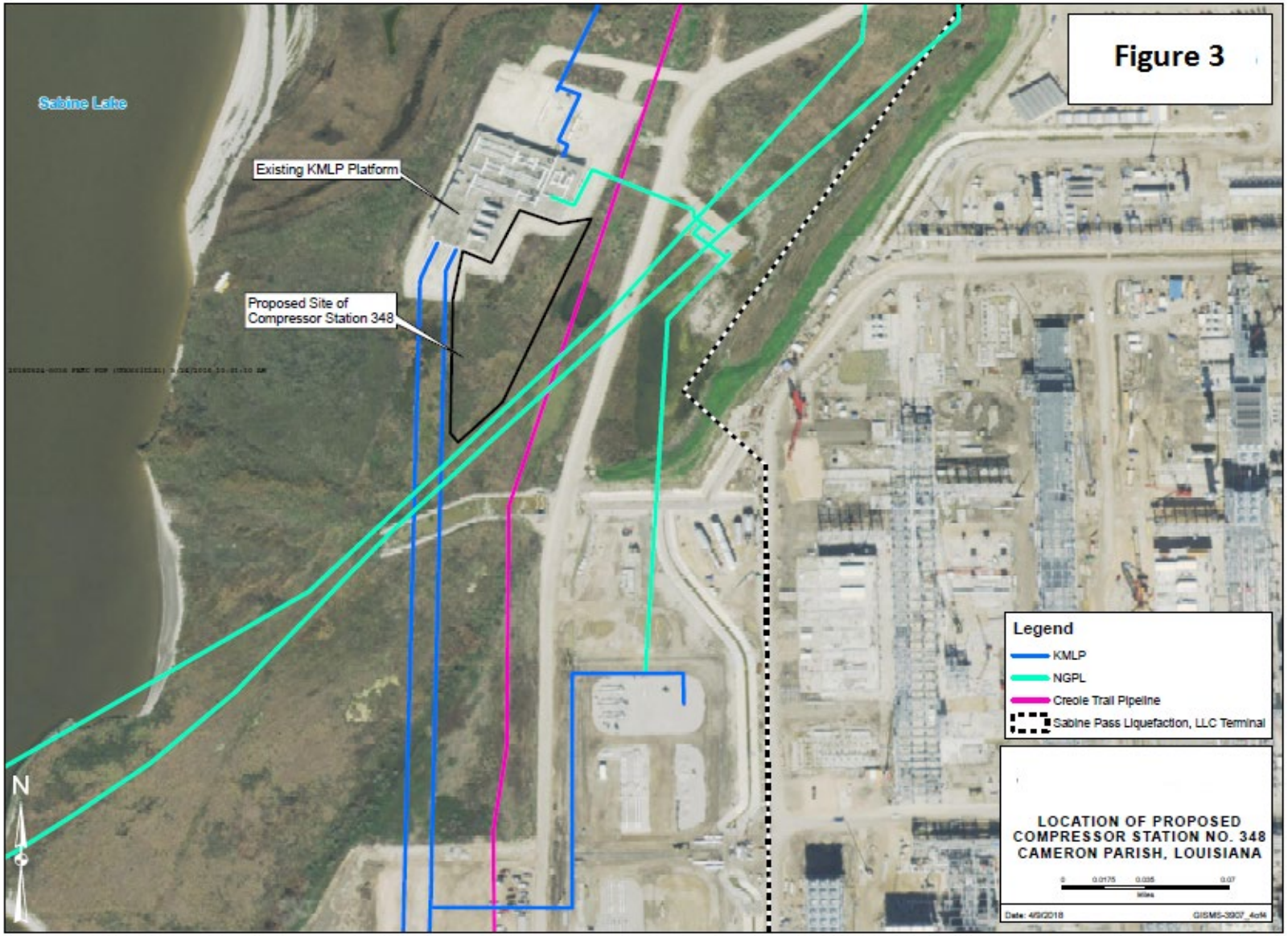
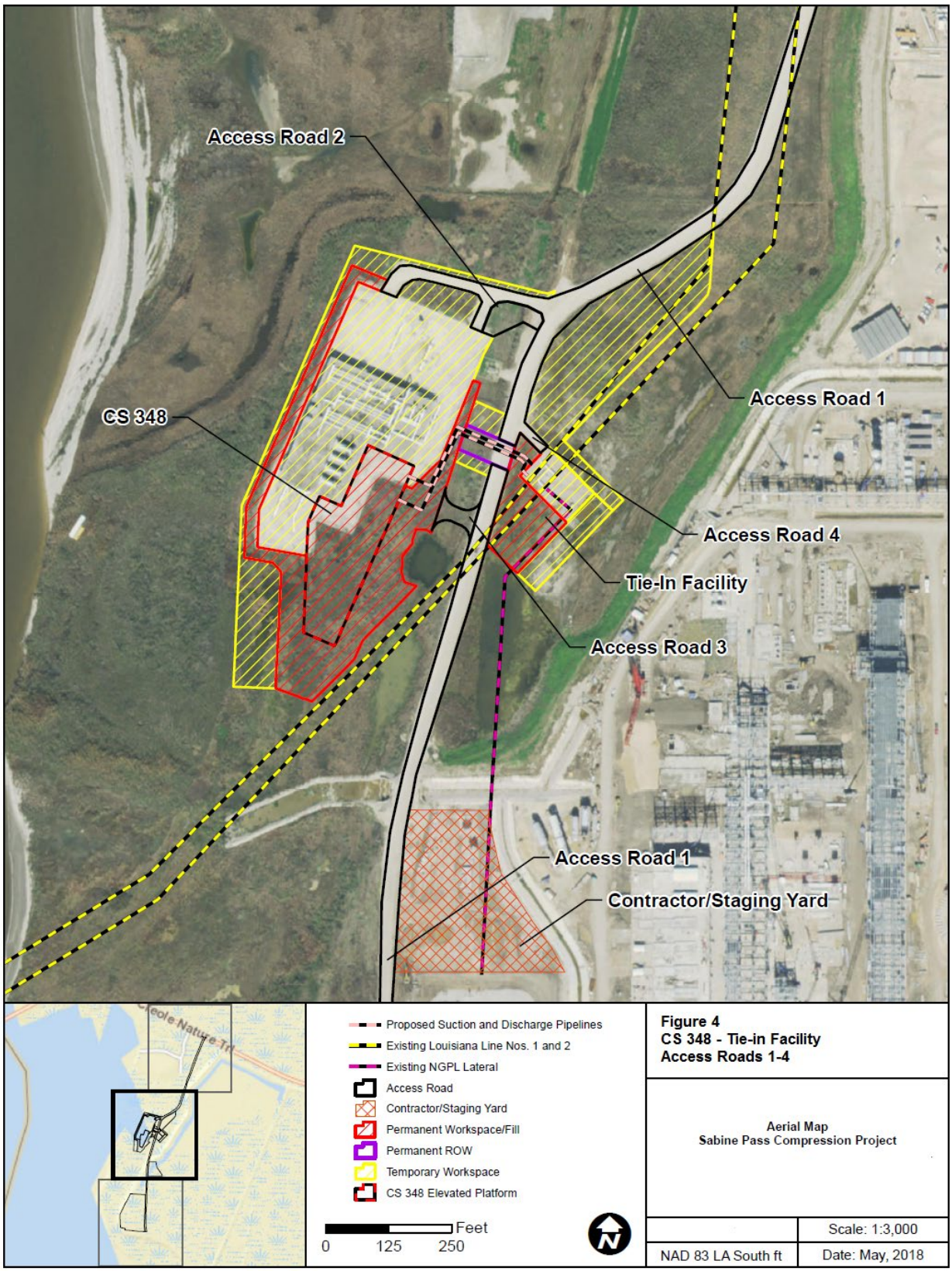


Figure 4 Location of CS 348, Tie-in Facility and Access Roads 1-4



A.4 Public Review and Comment

FERC issued a *Notice of Intent to Prepare an Environmental Assessment for the Sabine Pass Compression Project* (NOI) on July 3, 2018. The NOI was published in the Federal Register[2] and was mailed to interested parties including affected landowners; federal, state, and local governmental representatives and agencies; elected officials; environmental and public interest groups; potentially interested Indian tribes; and local libraries and newspapers. Written comments were requested from the public on specific concerns about the Project or issues that should be considered during the preparation of the EA. The public comment period was from July 3, 2018 to August 2, 2018.

In response to the Notice of Application, we received a comment letter from the Department of Wildlife and Fisheries of the State of Louisiana (LDWF) addressing erosion/sediment control measures, reducing impacts from temporary and permanent pipeline rights-of-way, and requesting proposed culverts be maintained to ensure hydrologic flow is uncompromised. These comments are discussed in Section B.3 of the EA. In response to the NOI, we received a comment letter from the National Marine Fisheries Service's (NMFS) Habitat Conservation Division (HCD) requesting a delineation of wetlands. Natural did conduct a wetlands delineation and provided it with their application. The Wetland Delineation Report is provided in Appendix 2A of Resource Report 2 on the Docket and the results are summarized in section B.3 of this EA. We also received a comment letter from the Choctaw Nation of Oklahoma requesting a copy of the EA and the cultural resources survey. Natural provided the cultural resources report to the Choctaw Nation of Oklahoma and the EA is available on the FERC website. The Quapaw Tribe of Oklahoma submitted a letter indicating that the Project is outside of the current area of interest for the Quapaw Tribe; therefore, the Quapaw Tribe does not desire to comment on this Project.

A.5 Construction Procedures

All facilities associated with the Project would be designed, constructed, tested, operated and maintained in accordance with the U.S. Department of Transportation (DOT) regulations in 49 CFR 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards,* and other applicable federal and state regulations. Natural would implement the following guidelines for the Project:

- FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* (Plan) and *Wetland and Waterbody Construction and Mitigation Procedures* (Procedures), with certain modifications;[3]

[2] 83 FR 32114 (July 11, 2018)

[3] The FERC Plan and Procedures are a set of construction and mitigation measures that were developed to minimize the potential environmental impacts of the construction of pipeline project in general. The FERC Plan can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/plan.pdf. The FERC Procedures can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/procedures/pdf.

- Spill Prevention and Response Procedures (SPRP);
- Plan for the Unanticipated Discovery of Contaminated Soils or Groundwater; and
- Fugitive Dust Control Plan.

Natural requested two modifications to the FERC Procedures which included an increased construction right-of-way width of 125 feet through wetlands and the need to construct an aboveground facility in a wetland. We have reviewed the requested modifications to the FERC Procedures and find them acceptable, as discussed in section B.3 of this EA. For this EA, we refer to the Procedures with incorporation of Natural's requested modifications, as "Natural's Procedures."

A.5.1 General Construction Procedures for Pipeline Facilities

Conventional open-cut pipeline construction techniques would be used for construction of the suction and discharge pipelines. Prior to initiating construction-related activities, Natural would secure a right-of-way easement, or other authorizations, from landowners whose properties would be crossed by the proposed suction and discharge pipelines. Owners and lessees of land crossed by the suction and discharge pipelines would be notified in advance of construction activities that could affect their property or operations.

Previously identified sensitive resources, such as wetland boundaries, would also be marked to minimize or avoid adverse impacts during pipeline construction. Where necessary, to contain disturbed soils during clearing and grading in upland areas, and to minimize potential erosion and sedimentation into wetlands and waterbodies, temporary erosion control devices (ECD) would be installed prior to initial ground disturbance and would be maintained throughout construction.

In wetland areas, topsoil would be stockpiled separately, per Natural's Procedures. Temporary and permanent ECDs would be installed and maintained to contain disturbed soils during trenching and to minimize potential erosion and sedimentation of wetlands and waterbodies.

Wetland Crossings

Wetland crossings for the suction and discharge pipelines would be accomplished via the conventional lay method in accordance with all applicable permits and Natural's Procedures. Construction techniques are similar to the open-cut method in upland areas; however, topsoil segregation techniques would be utilized to facilitate revegetation following the completion of construction activities. In some cases, site-specific conditions may not support construction equipment, but the area would still be crossed using the

conventional lay method. In these instances, construction mats would be used to minimize disturbances to wetland hydrology and maintain soil structure.

Hydrostatic Testing

Following backfilling of the trench, the suction and discharge pipelines would be cleaned and hydrostatically tested to ensure that the system is free from leaks and is capable of operating at the design pressure. Upon completion of the testing, the water would be discharged into an energy dissipation device located on timber mats in an upland area or transported off-site for disposal, in accordance with applicable federal and state regulations. Hydrostatic test water would only be in contact with new steel pipe that would be free of chemicals or lubricants.

Clean-up and Restoration

Following pipe installation and backfilling, disturbed areas would be restored and graded to pre-construction contours as closely as practicable in accordance with the FERC Plan and Natural's Procedures. Construction debris would be disposed of at appropriate facilities. Permanent erosion and sediment control measures would be installed as appropriate, and revegetation measures outlined in the FERC Plan and specific landowner requests would be implemented.

Road and Utility Crossings

The new suction and discharge pipelines would require the crossing of Duck Blind Road which is a gravel road using the open trench crossing method. The road crossing would be completed in such a manner to minimize the interruption of construction traffic associated with the Project on Duck Blind Road. A minimum of four feet cover over the pipe would be maintained at the road crossing, while a minimum of three feet of cover would be maintained at side borrow/drainage ditch crossings. In addition, the Project would require the crossing of Cheniere Creole Train Pipeline, L.P.'s existing natural gas pipeline utilizing an open trench crossing method to lay the suction/discharge pipelines below the existing pipeline. Pipeline warning signs and/or markers would be used to identify the presence of a pipeline.

A.5.2 General Construction Techniques for Aboveground Facilities

Landowner notification, surveying, and staking of the Project area associated with the proposed aboveground facilities would be conducted using the same general procedures described above for the pipeline facilities. Construction of CS 348 and the proposed Tie- in Facility would begin with grading, leveling, and compacting the soils for the placement of permanent fill material. Silt fence or other ECDs would be installed where necessary to minimize soil erosion and sedimentation in stormwater runoff from disturbed areas. Sediment and erosion controls would be implemented in accordance with the FERC Plan and Natural's Procedures. Any soil excavated for the placement of the permanent fill

material would be compacted in place, and excess soil would be used elsewhere on site or disposed of at an approved offsite location.

Following completion of clearing, grading, and soil compaction, clean aggregate fill material would be placed on geotextile fabric within the proposed permanent workspace located below and adjacent to the new elevated platform to provide a safe and stable work area for heavy construction equipment and pile-driving rigs. Geotextile fabric and fill material would also be placed within the new permanent workspace proposed for the Tie-in Facility. Temporary board mats would also be placed on top of the new permanent fill material and in adjacent temporary workspaces to prevent rutting and provide even distribution of weight for vehicular traffic.

CS 348 foundation construction would begin with the installation of concrete piles which would be positioned approximately 15 to 20 feet apart and installed using two pile driving rigs, after which caps would be installed and the elevated platform would be placed or poured. The Solar Titan 130 unit and associated equipment, as well as any buildings, would be placed on the new elevated platform. Pipe and other equipment would be assembled and welded on site. Aboveground piping would be installed on and adjacent to the new elevated platform and would be hydrostatically tested prior to operation. Additionally, safety and control devices would be installed and tested prior to operation.

Construction of the new Tie-in Facility foundation would begin in a similar manner, with installation of concrete piles and the new aboveground valves and associated piping at the proposed Tie-in Facility would be installed on the piles, and all new above and below ground piping would be hydrostatically tested prior to operation.

Following the completion of construction activities, board mats would be removed from temporary workspaces and areas overlying new permanent fill material. Permanent fill would be left in place to accommodate operation and maintenance activities at CS 348 and the Tie-in Facility.

A.5.3 Environmental Compliance, Training, and Inspection

Implementation details in construction drawings and specifications would be provided to ensure that the construction of the Project facilities would comply with certificate conditions, mitigation measures, and requirements of federal and state permitting agencies. Natural's contractors would receive copies of the design specifications and environmental documents. In addition, these contractors would be provided pertinent correspondence and documentation for mitigation measures that address pre-construction surveys, and clearances. Following the completion of construction, instructions and documentation to Natural's operating personnel would be provided to address post-construction requirements.

Training

Natural would conduct environmental training for its field personnel and the contractors' personnel regarding proper field implementation of the FERC Plan and Natural's Procedures, other site-specific environmental documents, regulatory conditions, and other mitigation measures. Natural would provide copies of permits and related drawings to all field personnel (employees and contractors) prior to the start of construction and ensure that all entities understand the proper procedures for construction, stabilization, and restoration.

Inspectors and Compliance Responsibility

Natural would assign an individual to perform the duties of Environmental Inspector (EI) to oversee and document environmental compliance and prepare the Project's status reports throughout construction. The EIs' responsibility is to ensure that Projects' construction is in compliance with all environmental conditions contained within the FERC Order and all other authorizations and permits. FERC staff would also conduct routine inspections during construction to determine compliance with any conditions of the Projects' facilities. Depending on the progress of construction, additional EIs may be added as necessary.

Operation and Maintenance

The Project's newly constructed facilities would be operated and maintained in accordance with the requirements of the Commission and the PHMSA regulations set forth in 49 CFR Part 192, pursuant to the provisions of the Natural Pipeline Safety Act of 1968, as amended.

Vegetation on the permanent easement associated with the proposed suction and discharge pipelines would be maintained by periodic mowing, as necessary, in accordance with the FERC Plan and Natural's Procedures to allow for visual inspections.

A.6 Land Requirements

The Project's land requirements, including both temporary and permanent impacts, would be approximately 24.3 acres, of which 3.3 acres would be permanently affected by the operation of the Project facilities. Temporary land includes those areas that would be temporarily disturbed by construction activities and restored to pre-construction conditions. Operational land includes lands with new permanent impacts that would be maintained for the life of the facilities. A summary of the land requirements for the Project is presented in table 2.

Construction of the new suction and discharge pipelines would require a construction right-of-way width of 125 feet. Following construction, a shared 50-foot-wide permanent easement would be retained for the parallel suction and discharge pipelines. Natural would enter into long-term agreements to lease the parcels of land for operation of CS 348 and the Tie-in-Facility. Land to be utilized for the operation of CS 348 would include the new elevated platform, on which the new Solar Titan 130 unit and associated auxiliary equipment would be situated, as well as associated operational footprint located below and adjacent to the proposed platform and existing KMLP Meter Station. The Project modifications at the existing X-L8E South Valve site are located along Natural's existing Louisiana Line Nos. 1 and 2. Contours would be restored to pre-construction conditions following the completion of construction activities in temporary workspaces, and areas disturbed by construction that are not part of the new permanent Tie-in Facility would be allowed to revegetate.

Natural would use two contractor/staging yards in the vicinity of the Project as shown in Figure 4. These would be used to accommodate material and equipment staging, to provide additional vehicular parking areas, and for additional equipment operation and fabrication activities. Natural would restore the contractor/staging yards to pre-existing condition following construction activities, resulting in no permanent impacts.

Natural would use five access roads, during construction of the Project facilities. Location of access roads 1-4 are shown in Figure 4. Access Road 5 is adjacent to X-L8E South Valve facility. Access Roads 1, 2, 4 and 5 are located along existing gravel roads and Natural would continue to use these existing facility access roads to provide operational access to CS 348, the Tie-in Facility, and the existing X-L8E South Valve. Access Road 3 is not located along an existing road, traverses wetlands located between the existing KMLP Meter Station and Duck Blind Road, and would be used for temporary access to the Project area during construction of CS 348. Following the completion of construction, areas impacted by Access Road 3 would be restored to pre-construction conditions. Natural proposes to permanently expand Access Road 2 by 0.1 acre and maintain this area to accommodate access to CS 348 during operations.

Table 2 Summary – Land Requirements		
Facility	**Project Land Affected Construction (areas)[a]**	**Project Land Affected During Operation (areas)[b]**
Compressor Station 348[c]	7.9	2.6
Tie-in Facility[d]	1.0	0.5
Suction/Discharge Pipelines	0.2	0.1
X-L8E South Valve[e]	0.1	0.0
Contractor/Staging Yards	11.0	0.0
Access Roads	4.1	0.1
Project Total	24.3	3.3

[a] Land affected during construction includes operation impacts (new permanent).
[b] Land affected during operation consists only of new permanent impacts and, therefore, does not include areas of existing facilities and existing access roads which would be used for operational access to Project facilities, as these areas would not require new permanent impacts.
[c] Land affected during construction of CS 348 consists of 3.0 acres of land within the existing KMLP Meter Station facility fence line and 4.9 acres of land outside of the existing fence line.
[d] Land affected during construction of the Tie-in Facility consists of 0.2 acre of land within the existing Natural Tap facility fence line and 0.7 acre of land outside of the existing fence line.
[e] Land affected during construction is entirely contained within the existing facility fence line.

A.7 Construction Schedule

Natural anticipates mobilization, clearing, and construction of the Project facilities to begin in 2019 and the total construction duration would be 12 months. Most construction would take place during working hours of 7:00 a.m. until 10:00 p.m., Monday-Sunday and on federal holidays. However, weather conditions, site conditions, and specialized construction techniques, or emergencies may necessitate nighttime work or extended work on Sunday.

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. These "non-jurisdictional" facilities may be integral to the need for the proposed facilities, or they may be merely associated as minor components of the jurisdictional facilities that would be constructed and operated as a result of authorization of the proposed facilities. For CS 348, power would be provided directly through a drop from the overhead power line transmission corridor, which is located directly west and parallel to Duck Blind Road, to a utility meter and disconnect switch located on the new elevated platform for CS 348. The Tie-in Facility would require power to operate the flow and pressure controls; however, the

existing power service associated with the existing Natural Tap would be sufficient for the proposed Tie-in Facility.

The power supply is part of a separate construction project under state and local jurisdiction, and the local utility provider would obtain all required permits and approvals prior to initiating construction of the non-jurisdictional power drop.

A.9 Permits and Approvals

Natural would construct the Project in accordance with all applicable federal, state, and local regulatory requirements. Table 3 lists federal and state environmental permits and approvals associated with the Project.

Table 3 Permits and Approvals		
Agency	**Permit/Consultation**	**Status**
Federal		
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity	Pending
Individual Section 404 Permit	U.S. Army Corps of Engineers – Galveston District	Pending
Endangered Species Act Section 7 Consultation	U.S. Fish and Wildlife Service – Louisiana Ecological Services Field Office	Further coordination is not necessary due to no effect determinations for federally listed species and critical habitat, as indicated in the reports issued via the U.S. Fish and Wildlife Service Project Review and Guidance for Other Federal Trust Resources on March 20, 2018 and April 5, 2018.
Bald and golden Eagle Protection Act, Migratory Bird Treaty Act	U.S. Fish and Wildlife Service – Louisiana Ecological Services Field Office	Concurrence received June 27, 2018 – Initiate Project activities prior to the start of the nesting season (April 15); Implement FERC Plan and Natural's Procedures.
Essential Fish Habitat Consultation	National Oceanic And Atmospheric Administration, National Marine Fisheries Service	Concurrence received June 27, 2018.
State		
Joint Application for a Coastal Use Permit (Individual)	Louisiana Department of Natural Resources – Office of Coastal Management	Pending
Clean Water Act Section 401 Water Quality Certification	Louisiana Department of Environmental Quality	Automatic with Section 404 Permit Authorization – Pending
Hydrostatic Test Water Discharge Permit (LAG-67)		Notification to be provided prior to discharge in accordance with Natural Statewide General Permit – Pending
State Minor Source Air Permit		Administrative Completeness Determination received – May 21, 2018 - Pending
State Threatened and Endangered Species Consultation	Louisiana Department of Wildlife and Fisheries	Concurrence received June 27, 2018 – Implement adequate erosion and siltation control measures; Maintain culverts to ensure stream flow is uncompromised; Conduct Project activities at the existing X-L8E South Valve site outside of the nesting season.
National Historic Preservation Act Section 106 Consultation	Louisiana Office of Cultural Development Division of Historic Preservation	Concurrence received June 25, 2018.

SECTION B – ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short-term, long-term, and permanent. Temporary impacts generally occur during construction with the resource returning to preconstruction condition almost immediately afterward. Short-term impacts could continue between two to five years following construction. Impacts were considered long-term if the resource would require more than 5 years to recover. A permanent impact could occur as a result of any activity that modifies a resource to the extent that it would not return to preconstruction conditions during the life of the Project.

In the following sections, we address direct and indirect effects collectively, by resource. The analysis contained in this EA is based upon Natural's application and supplemental filings. However, if the Project is approved and proceeds to the construction phase, it is not uncommon for a project proponent to require minor modifications (e.g., minor realignments, changes in workspace configurations, etc.).

B.1 Geology

B.1.1 Physiographic Settings and Geologic Conditions

The Project would be within the West Gulf Coastal Plain section of the Coastal Plain physiographic province (U.S. Geological Survey [USGS], 2004). The West Gulf Coastal Plain section is characterized by nearly level to moderately rolling irregular plains, which were formed by the deposition and subsequent uplift of continental marine sediments from the end of the Cretaceous period to the Pleistocene period (The Nature Conservancy, 2003). Per USGS topographic mapping, the Project area is generally flat to gently sloping, and elevations range from approximately three to six feet above mean sea level at CS 348 and adjacent Project facilities, and from approximately one to two feet above mean sea level at the X-L8E South Valve. The primary and secondary lithology of the Project vicinity are clay or mud, and silt, respectively (USGS, 2005).

Subsurface conditions at the proposed CS 348 workspace were explored in mid-2018 by drilling seven soil borings to depths of 60 to 100 feet below existing grade. Beneath surficial fill materials, soft to stiff cohesive clay was encountered to depths ranging from about 77 feet to 82 feet below existing grade, underlain by poorly graded sand to a depth of at least 100 feet below existing grade. Water was encountered at depths between 0 to 14 feet below existing grade.

B.1.2 Mineral and Paleontological Resources

Louisiana's primary resources include oil and gas production, and non-fuel mineral resources including salt, sand and gravel, crushed stone, and lime. A search of oil and gas production and non-fuel mineral resources in the Project vicinity utilizing the Louisiana Department of Natural Resources (LDNR) Strategic Online Natural Resource Information

System (SONRIS) (LDNR, 2018) and the USGS Mineral Resource Data System (USGS, 2011) showed that there are:

- two gas wells within 0.25 mile of the Project, with the nearest located 0.22 mile northeast of AR-5;
- one active saltwater injection well located 0.11 mile west of AR-1; and
- no natural gas storage reservoirs, active or inactive mines, quarries, or mine spoil areas within 0.25 mile of the Project.

Project construction and/or operational impacts on fuel and non-fuel mineral resources are not anticipated given the distance to the nearest mineral resources.

The State of Louisiana does not have protected fossils, and per agency correspondence with the Louisiana Geological Survey (LGS), the presence of fossils is not likely in the Project area (LGS, 2002; McCulloh, 2018). Should paleontological resources be discovered during construction, Natural would notify the state geological survey or natural history museum as well as the FERC, so that all finds may be properly documented; therefore, no adverse impacts on sensitive or rare paleontological resources are anticipated.

B.1.3 Geologic Hazards

Geologic hazards are natural, physical conditions that could result in damage to land surface and structures or injury to people. In the Project area, the potential for such hazards typically includes seismicity associated with earthquakes and surface faulting, soil liquefaction, landslides, flooding, and ground subsidence.

Historically, very few earthquakes have been recorded in Louisiana. A search of historical earthquake events was conducted utilizing the USGS Earthquake Archive search tool (USGS, 2018a). The results of this search showed for the period between January 1900 and October 2018 earthquakes with a magnitude greater than 1.0 on the Richter scale did not occur within 10 miles of Project facilities.

The shaking during an earthquake can be expressed in terms of the acceleration as a percent of gravity (g). The USGS Seismic Hazard Probability Mapping shows that for the Project area, there is a 2 percent probability of an earthquake with an effective peak ground acceleration (PGA) of 2 to 4 percent g; and a 10 percent probability of an earthquake with an effective PGA of 1 to 2 percent g being exceeded in 50 years (2,500 and 500-year return period, respectively) (USGS, 2014a). For reference, a PGA of 10 percent g (0.1g) is generally considered the minimum threshold for damage to older structures or structures that are not constructed to resist earthquakes.

No incidences of induced seismicity have been identified in the Project vicinity. The closest incidence of induced seismicity occurred approximately 132 miles north of AR-1 (USGS, 2016).

Project facilities are not anticipated to be affected by faults given the nature of fault movement (gradual creep) and the composition of sediments and rocks that underlie the fault system, which are likely unable to generate the energy required to produce significant seismic events (Crone and Wheeler, 2000).

The Project is in an area with low seismicity, including potentially induced seismicity and, as such, the potential for soil liquefaction to occur is negligible.

Ground subsidence, involving the localized or regional lowering of the ground surface, may be caused by karst formation due to limestone or gypsum bedrock dissolution, compaction and consolidation of Holocene deposits and faulting, and human influences such as sub-surface fluid extraction and drainage for agriculture, flood protection, and development.

The nearest natural gas extraction well is 0.22 mile from Project facilities, subsurface mines do not occur in the Project area, and the nearest salt dome is approximately 5.8 miles south of AR-1 (offshore). No karst terrain is present and the lithology that could lead to bedrock dissolution and karst development does not generally occur within the Project area. Furthermore, Natural is proposing to utilize deep-driven piles in the CS 348 elevated platform and Tie-in Facility designs, which would mitigate potential impacts associated with destabilization, settling, or subsidence. Therefore, the Project is not anticipated to be adversely affected by ground subsidence.

Landslide incidence and susceptibility derived from the digital Landslide Overview Map of the Conterminous United States (USGS, 2014b) characterize the Project area as having a low incidence and low susceptibility for landslides. This is further supported by the generally flat topography and low potential for seismicity present in the Project area. As such, the potential for landslides to occur during construction or operation of the Project is negligible.

The Project could be affected by flash flooding due to its proximity to the Sabine Pass waterway, Sabine Lake, other waterbodies, and because the entirety of the Project would be within the 100-year floodplain (AE Zone) as determined by the Federal Emergency Management Agency. AE Zones are subject to inundation by the 1 percent chance of an annual flood event.

Storm surge levels of 10 to 15 feet were recorded in the general area of the proposed CS 348 by the National Weather Service during Hurricane Ike and Rita, respectively, and up to 18 feet occurred across Cameron Parish during the same events. As a result, CS 348 would be constructed on an elevated platform, approximately 19.1 feet above existing grade (equivalent to 22.3 feet above mean sea level), thus minimizing

impacts due to flooding from heavy rains, high winds, and hurricane storm surge. Additionally, sensitive controls for the valves located in the tie-in area would also be located on the elevated station platform to ensure they would be located above storm surge and the new valves and associated aboveground piping at the proposed Tie-in Facility would be supported by piles extending approximately four feet above the existing grade (equivalent to 7.2 feet above mean sea level).

The existing X-L8E South Valve and associated AR-5 would be within the 100-year floodplain; however, Project activities would be entirely within the limits of the existing gravel facility and the access road.

The installation of impervious surfaces within floodplains can alter hydrogeology of an area during a flood event by affecting the available capacity of the land to hold water. CS 348, the Tie-in Facility, and the new permanent access road (AR-2) would require the installation of an estimated 3.2 acres of new impervious surfaces. The area of impervious surfaces associated with installation of the aboveground facilities in floodplains is relatively minor when compared to the floodplain as a whole. Further, Natural would obtain all necessary permits and/or approvals from applicable authorities for construction within the floodplain, and the proposed facilities would meet or exceed federal, state, and local safety and design standards. Installation of the suction/discharge pipeline would not affect the floodplain, as it would be installed subsurface and all contours would be restored following the completion of construction activities. Therefore, we do not anticipate that impacts on floodplain storage from the Project would be significant.

B.2 Soil

The National Resources Conservation Service (NRCS) Web Soil Survey provides descriptions of the soil series crossed by the Project (2018). There are four soil series within the Project area: Aquents, frequently flooded; Midland silty clay loam (0 to 1 percent slopes, rarely flooded); Udifluvents (1 to 20 percent slopes); and Creole mucky clay. Project area soils are compaction prone and classified as having low to moderate revegetation potential. Soils are not characterized by the presence of shallow bedrock (consolidated rock 60 inches or less from the surface) and blasting is not proposed or anticipated to be required for construction of the Project. The majority of the Project area (24.01 acres) is underlain by the Aquents and Udifluvents soil units, which are not rated for wind or water erosion potential.

Approximately 0.20 acre of the soils affected by the Project are considered prime farmland; however, these soils are entirely associated with the existing X-L8E South Valve, and have already been converted to industrial land. Therefore, no prime farmland, unique farmland, or farmland of statewide importance soils would be converted as a result of Project activities.

All Project area soils have a high compaction potential. In general, rutting and compaction of soils would be avoided or minimized through the use of timber mats during construction, as necessary based on site-specific conditions at the time of construction. Natural would utilize topsoil and sub-soil segregation techniques in wetland areas located outside of the permanent facility sites to return soil horizons to near their original state. Soils compacted by Natural's construction activities, excluding permanent areas, aboveground facility sites, and new permanent access roads, would be decompacted prior to Project completion. As such, any adverse impacts due to rutting and compaction would be adequately mitigated. Soils underlying permanent aboveground facility foundations would be permanently affected by compaction; however, these effects would be highly localized and minor.

Soil expansion occurs when soils consisting primarily of clay and silt expand as a result of increased moisture content, and shrink upon drying With the Project area, one soil map unit, Midland silty clay loam, which covers 0.2 acre associated with the X-L8E South Valve and AR-5, is rated with high shrink-swell potential. However, Project activities at the X-L8E South Valve and AR-5 would not require excavation or ground disturbance and would occur within the limits of the existing facility fence line and associated gravel road. Therefore, the presence of shrink-swell soils is not anticipated to significantly impact Project construction or operation.

Soil erosion is the wearing away of physical soil properties by wind and water, and could result in a loss of soil structure, organic matter, and nutrients, all of which, when present, contribute to healthy plan growth and ecosystem stability. While Project area soils are not considered highly erodible by wind or water, clearing, grading, and equipment movement can accelerate the erosion process and, without adequate protection, result in discharge of sediment to waterbodies and wetlands. Factors such as soil texture, structure, slope, vegetation cover, rainfall intensity, and wind intensity can influence the degree of erosion.

To minimize or avoid potential impacts due to soil erosion, Natural would utilize controls that would be implemented in accordance with the FERC Plan and Natural's Procedures. Temporary erosion control devices, such as 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. Temporary trench breakers would be installed immediately following trench excavation. These devices would be inspected on a regular basis, as well as after each rainfall event of 0.50 inch or greater to ensure that the controls are functioning properly. During construction, the effectiveness of temporary erosion control devices would be monitored by Natural's EI(s). Temporary erosion control devices would be maintained until the Project area has been successfully revegetated or otherwise stabilized with surface cover.

Natural may install permanent erosion control devices, such as permanent slope breakers, riprap, or rock outlet protection, in addition to performing regular restoration and revegetation activities. Permanent erosion control devices would be installed in accordance with revegetation measures outlined in the FERC Plan and Natural's Procedures, applicable federal and state regulations, and specific landowner requests. The effectiveness of revegetation and permanent erosion control devices would be monitored by Natural's operating personnel during the long-term operation and maintenance of the Project facilities.

Following the completion of construction activities, upland areas temporarily disturbed by the Project would be reseeded in accordance with the FERC Plan and landowner requirements. Natural would utilize seed mixtures and application rates for revegetation established in the NRCS's Louisiana Plant Materials Technical Note No. 1 (2017). In unsaturated wetland, topsoil segregation techniques would be utilized to preserve the seed bank and allow for successful revegetation.

Given Natural's proposed mitigation measures and that disturbed areas would be returned to pre-construction conditions, maintained in an herbaceous state, or stabilized with gravel cover, permanent impacts due to soil erosion or poor revegetation potential are not anticipated.

Inadvertent Spills or Discovery of Contaminants

Based on a review of federal and state databases, there is no known soil contamination in the immediate vicinity of Project areas (EPA, 2018a, 2018b; LDEQ, 2015, 2017). Natural has developed a *Plan for the Unanticipated Discovery of Contaminated Soils or Groundwater* which would be implemented in the event of discovery of contaminated soil or groundwater during construction. Specifically, Natural would cease activities in that area, initiate measures to avoid the spread of contamination, initiate measures to characterize the contamination, and notify appropriate agencies.

Soil contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment would be minimized by implementation of Natural's SPRP, which specifies preventive measures to reduce the likelihood of a spill, as well as cleanup procedures in the event of soil contamination from spills or leaks of fuels, lubricants, coolants, or other hazardous materials. Should a spill occur, Natural would follow their SPRP to contain the material and to ensure spills would be cleaned up and disposed of in an appropriate manner.

Based on these measures, we conclude that impacts on soils from aboveground facilities and access roads would be permanent but minor and the potential for other adverse impacts would be adequately mitigated.

B.3 Water Resources and Wetlands

B.3.1 Surface Water Resources

The CS 348, Tie-in Facility and adjacent Project facilities are located within the Sabine Lake watershed. The X-L8E South Valve site is located within the Mermentau watershed. Drinking water for Cameron Parish is mostly surface water and no surface water intakes are located within three miles of any Project waterbody crossing. Natural stated that based on conversations with the LDEQ in February, April, and September 2018 no public water supply intakes, public water wells, or surface water protection areas are within the vicinity of the Project. Further, no sensitive waterbodies are located within 0.5 mile of the Project area (NPS 2018, 201; Louisiana Department of Wildlife and Fisheries, 2012).

The watershed sub-segment in which the X-L8E South Valve site is located is listed as being impaired under Section 303(d) of the Clean Water Act. It is listed as being impaired for dissolved oxygen and mercury in fish tissue in Lacassine Bayou-from Headwaters to Grand Lake. This waterbody is located 2.8 miles east of AR-5 and it is not anticipated the Project would affect this waterbody.

The SPL Terminal, located adjacent to CS 348 which includes overlapping workspaces with the Project contractor and storage yards and AR-1, operates under the National Pollutant Discharge Elimination System permit. It is identified as a point source pollution discharge facility. The SPL Terminal had a noncompliance violation in 2017 for an effluent exceedance of biochemical oxygen demand, general fecal coliform, and total suspended solids. AR-1 crosses a stormwater outfall of the terminal through an existing culvert. As such, the Project is not expected to contribute to additional impairment of potentially contaminated waters.

The Project would require four waterbody crossings. None of the waterbodies are perennial and all but one are less than 10 feet wide. The waterbody crossings are identified in table 4.

Table 4 Waterbodies within the Sabine Pass Compression Project Area

Feature ID	Waterbody Name	State Water Quality Class.[a]	Fisheries Class	FERC Classification	Flow Regime	Approx. Width (feet)[b]	Project Facility	Proposed Crossing Method	Temporary Impacts (acres)	Permanent Impacts (acres)
SP1CA001	Roadside Drainage Ditch	PCR, SCR, FWP	Warmwater	Minor	Ephemeral	1	Suction / Discharge Pipelines ROW	Timber mat	0.001	0.00
							Access Road 2	Existing permanent culvert	0.00 [c]	0.00 [c]
								New permanent culvert	0.00	0.001 [d]
								Timber mat	0.0004	0.00
SP1CA002	Unnamed Tributary of Sabine Pass	PCR, SCR, FWP	Warmwater	Minor	Ephemeral	3	CS 348	Fill	0.00	0.001 [e]
								Timber mat	0.001	0.00
SP1CA003	Facility Stormwater Outfall	PCR, SCR, FWP	Warmwater	Intermediate	Intermittent	32	Access Road 1	Existing permanent culvert	0.00 [c]	0.00 [c]
SP1CA005	Roadside Drainage Ditch	PCR, SCR, FWP	Warmwater	Minor	Ephemeral	4	Contractor / Staging Yard	Timber mat	0.03,	0.00
								Existing permanent culvert	0.00 [c]	0.00 [c]
Subtotals									*0.03*	*0.002*
Project Construction workspace Total									*0.032*	

[a] State Water Quality Classifications in Louisiana LDEQ, 2016a

PCR – primary contact recreation ; SCR – secondary contact recreation; FWP – fish and wildlife propagation

[b] Approximate waterbody width is based on the ordinary high watermark, as verified by field survey.

[c] Portion of waterbody would be crossed via existing permanent culvert, which would not require modifications or improvements.

[d] Portion of waterbody would be permanently affected by placement of new permanent culvert (located adjacent to existing culvert) to accommodate operational access to CS 348 facility.

[e] Waterbody would be permanently impacted by placement of new permanent fill material to accommodate construction and operation activities at the CS 348 facility.

Impacts on waterbodies that may occur include modification of aquatic habitat, stream bank erosion, increased sedimentation and turbidity, decreased dissolved oxygen concentrations, inadvertent release of chemical and nutrient pollutants from sediments, and introduction of chemical contaminants.

As noted above, the Project would impact four waterbodies. Two would be crossed by access roads, one would be located within the workspace for CS 348, and one would be located within a contractor/staging yard. Waterbody SP1CA001 would be crossed by AR-2. This is an existing road that Natural would expand. As such Natural would use timber mats for temporary access during construction across a portion of SP1CA001 north of an existing culvert and would also install a new permanent culvert within SP1CA001 located south of the existing culvert. Natural would also cross SP1CA001 via timber mats for the construction of the suction/discharge pipelines' right-of-way. In addition, at the compressor station, waterbody SP1CA002 would be crossed via timber mats during the station construction. SP1CA003 would be crossed by AR-1. Waterbody SP1CA003 is located within a contractor/staging yard and would be crossed via an existing culvert and timber mats during construction. Following construction, the timber mats would be removed.

To minimize these impacts on waterbodies, Natural would adhere to their Procedures. Natural would also implement best management practices and install erosion control devices including using equipment bridges, mats, and pads where possible. Natural stated that according to the LDWF, no in-stream timing restrictions are applicable to the waterbodies affected by the Project. All construction, except in two ephemeral streams, would be temporary. Approximately 0.001 acre of SP1CA002 would be permanently filled to construct and operate CS 348. This fill would be placed at the stream headwater and would not impact the overall function of the stream. In addition, a permanent culvert would be installed in SP1CA001 which would result in 0.001 acre of impacts. This culvert would not restrict stream flow and would consist of a steel pipe stabilized by clean rock materials brought in from an off-site source.

Upon completion, vegetated areas outside of the new permanent aboveground facility sites would be restored to pre-construction conditions to the extent possible and temporary erosion control devices would be installed to minimize erosion until the crossing is stabilized and the stream bank vegetation has re-established. In addition, permanent erosion control devices may be installed to prevent further erosion at the crossing location.

Turbidity and sedimentation would not occur during construction unless there is flow in the stream at the time of construction. If flow is present, Natural would use matting and equipment bridges within the workspaces to reduce temporary impacts. Natural would implement their Procedures to avoid the movement of sediment off of Project construction sites into surrounding waterbodies. Natural also stated that if trench dewatering is necessary, accumulated water would be discharged through haw/straw bales and/or filter bags into vegetated areas.

Natural would also adhere to the FERC Plan and their Procedures to minimize impacts from inadvertent spills of fuels, lubricants, solvents, or other hazardous materials that could affect water quality. This includes no storage of hazardous materials, chemicals, lubricating oils, and fuels during construction within 100 feet of surface waterbodies or wetlands. The LDWF requested that culverts be maintained to ensure that hydrological flow is uncompromised. Natural has committed to restoring all waterbodies affected by construction to their previous physical conditions. Based on Natural's implementation of its Procedures, we conclude that there would not a significant impact on surface water resources.

B.3.2 Groundwater Resources

The Project area is within the Coastal Lowlands aquifer system. The Coastal Lowlands aquifer system is a regional aquifer spanning from coastal Texas to Florida. Groundwater withdrawn from the aquifer is used for agricultural, public supply, industrial, and other domestic and commercial purposes. The Coastal Lowlands aquifer system is comprised of permeable zones typically consisting of sand and clay. Some of these permeable zones with water-yielding and confined spaces have been regionally identified and received local names. All Project sites are within the locally named Chicot aquifer.

The Chicot aquifer is the main source of fresh groundwater for southwestern Louisiana and the only source of fresh groundwater for Cameron Parish (USGS, 2014c). The average depth to the base of fresh groundwater in the Chicot aquifer in Cameron Parish ranges from approximately 300 feet below the National Geodetic Vertical Datum of 1929 ("NGVD 29") to 800 feet below the NGVD 29 (USGS, 2014c). However, the southwestern portion of Cameron Parish, where CS 348 and adjacent Project facilities are located, does not contain fresh groundwater within the confining unit of the aquifer (USGS, 2002). The closest area overlaying fresh groundwater in proximity to the CS 348 and adjacent Project facilities is north of Sabine Lake, approximately 17.5 miles northeast of AR-1 (Louisiana Department of Natural Resources [LDNR], 2018).

Based on the results of geotechnical investigations conducted for other projects in the area and water well drilling records of nearby wells, depth to groundwater near CS 348 ranges from 5 to 13.5 feet (LDNR, 2018). Project facilities associated with the existing X-L8E South Valve site are underlain by fresh groundwater at a depth of approximately 20 to 60 feet below the land surface (LDNR, 2018).

In 2010, water withdrawals in Cameron Parish were approximately 26.9 million gallons per day (mgd), including 19.2 mgd from surface water sources and 7.74 mgd from the Chicot aquifer system. Water use in the parish in 2010 was primarily for rice irrigation (81 percent) but other uses included public supply, industrial, rural domestic livestock, and aquaculture. All water withdrawn for public supply (1.7 mgd) was from Chicot aquifer system (USGS, 2012).

The U.S. Environmental Protection Agency (EPA) oversees the Sole Source Aquifer Protection Program to protect high production aquifers that supply 50 percent or more of the region's water supply and for which there are no reasonably available alternative drinking water sources should the aquifer become contaminated. The Project area overlies the Chicot aquifer, which is a sole-source aquifer (EPA, 2017). However, CS 348 and the adjacent Project facilities are underlain by a portion of the Coastal Lowlands aquifer system that does not contain freshwater. Consequently, the Project would not impact portions of the aquifer that are used for water supply.

Based on review of water well registration data from SONRIS, information obtained from the LDEQ, and discussions with landowners, the Project does not overlie Source Water Protection Areas and no public or private water wells are within 150 feet of the Project area.

Groundwater Contamination

Based on a review of federal and state databases, there is no known groundwater contamination in the immediate vicinity of Project areas (EPA, 2018a, 2018b; LDEQ, 2015, 2017). If contaminated groundwater is encountered during construction of the Project, Natural would implement measures outlined in the Project-specific SPRP. The SPRP identifies the steps to follow in the event that contaminated groundwater, as identified by evidence of odor, sheen, or other such indicators, is encountered during construction.

An accidental spill of fuel or hazardous material during refueling or maintenance of construction equipment could affect groundwater if not cleaned up appropriately. Soils affected from spills could continue to leach contaminants to groundwater long after the spill has occurred. To minimize the risk of potential fuel or hazardous material spills, Natural would implement the measures in its SPRP, which include spill prevention measures, reporting protocols, mitigation measures, and cleanup methods to reduce potential impacts should a spill occur.

Groundwater Impacts and Mitigation

Project activities at the X-L8E South Valve and AR-5 would not require excavation or ground disturbance and would occur within the limits of the existing facility fence line and associated gravel road; therefore, potential impacts on groundwater are not anticipated to occur.

Due to the shallow nature of the perched groundwater table, groundwater could sustain minor impacts immediately adjacent to Project areas from temporary changes in overland water flow and recharge from trenching, backfilling, trench dewatering, clearing and grading; however, this effect would be temporary and flow patterns would return to pre-construction conditions once activities cease. Water infiltration, which is normally enhanced by vegetation, could be reduced in cleared areas until vegetation is reestablished. Additionally, water tables may be altered in areas where soil compaction occurs due to the

presence and movements of heavy machinery. The addition of impervious surfaces at aboveground facilities can also affect overland flow patterns and subsurface hydrology.

During construction, Natural would limit the amount of time trenches remain open to allow local water tables to return to original elevations as quickly as possible. In accordance with our Plan and Natural's Procedures, upon completion of construction, Natural would restore temporary workspaces to original contours, to the extent practicable, and would re-vegetate disturbed areas, excluding areas within permanent aboveground facility fencelines and access roads, with the goal of restoring preconstruction overland flow and recharge patterns. The addition of impervious surfaces at aboveground facilities may affect overland flow patterns and subsurface hydrology. However, these effects would be highly localized and minor.

Installation of piles has the potential to create preferential flow paths through aquitards or low permeability layers of multi-layered aquifers. Natural is continuing to refine the pile configuration for the proposed CS 348 and Tie-in Facility; however, due to the absence of known groundwater contamination at CS 348 and the Tie-in Facility, the salinity of the groundwater, and the interbedded nature of the aquifer, adverse impacts on groundwater quality from installation of piles are not anticipated.

Furthermore, while review of publicly available data searches did not identify any private or public municipal water wells within 200 feet of the Project area, in the event water wells are identified in advance of construction, if requested by the well owners, Natural would perform pre- and post-construction monitoring of well yield and water quality for water wells within 200 feet of the Project area.

With implementation of the mitigation measures described above, we conclude that the Project would not result in significant impacts on groundwater resources in the Project area.

B.3.3 Hydrostatic Testing

In accordance with DOT regulations, Natural would conduct hydrostatic testing of the below and aboveground piping prior to placing them into service. Hydrostatic testing is a method by which water is introduced to segments of pipe and then pressurized to verify the integrity of the pipeline. Natural would obtain hydrostatic test water from a municipal source to avoid impacts on surface waters. The rate of discharge would be at a maximum rate of 1,500 gallons per minute and would either be discharged to holding tanks to be disposed of at an off-site facility or would be discharged into a well-vegetated upland area within or adjacent to the existing facility. The approximate volume needed for testing would 2,200 gallons of water. The hydrostatic testing would be conducted in accordance with all applicable federal, state, and local permit requirements.

B.3.4 Floodplains

The Project would be located within the Federal Emergency Management Act (FEMA) 100-year floodplain (FEMA, 2010). The 100-year floodplain constitutes an area having a one percent probability of a flooding event within any given year.

The Executive Order 11988 directs federal agencies to lead the Nation by example by demonstrating a comprehensive approach to floodplain management. The order requires agencies to: (1) avoid, to the extent possible, the long and short term adverse impacts associated with the occupancy and modification of floodplains, and (2) avoid the direct or indirect support of floodplain development whenever there is a practicable alternative.

The Executive Order 11988 establishes avoidance of actions on the base of the floodplain, or the 100-year floodplain, as the preferred method for meeting these requirements. Natural would construct CS 348 on an elevated platform approximately 19.1 feet above existing grade. In addition, the new valves and associated piping at the tie-in facility would be constructed on piles that extend approximately four feet above the current grade. All Projects activities relating to the X-L8E South Valve site, and its associated access road, would be conducted within an existing gravel facility and access road. Natural would obtain all necessary permits and approvals prior to construction.

The CS 348 site, the Tie-in facility, and the new permanent access road AR-2 would require approximately 3.2 acres of new impervious surfaces. As this area is small compared to the entirety of the floodplain and as the proposed facilities would meet, or exceed federal, state, and local standards, significant impacts on the flood storage capacity in the region is not expected.

B.3.5 Wetlands

Wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE 1987). We define wetlands as any area that is not actively cultivated or rotated cropland and that satisfies the requirements of the current federal methodology for identifying and delineating wetlands. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetland surveys were conducted in the Project area in February 2018.

Two wetland types were identified in the Project work areas: Estuarine intertidal scrub-shrub (E2SS) and estuarine intertidal emergent (E2EM). The classification of wetlands is based on the vegetation present and the hydrology. Construction of the Project would require a total of 14 crossings of 7 wetlands. The wetland crossings are depicted in table 6.

Construction would impact three E2EM wetlands. The dominate vegetation associate with these wetlands includes broadleaf cattail (*Typha latifolia*), saltgrass (*Distichlis spicata*), cosmopolitan bulrush (*Schoenoplectus maritimus*), Jesuit's bark (*Iva frutescens*), seaside goldenrod (*Solidago sempervirens*), bushy seaside tansy (*Borrichia frutescens*), smooth cordgrass (*Spartina alterniflora*), and gulfdune paspalum (*Paspalum monostachyum*). In addition four E2SS wetlands would be crossed by the Project. Vegetation associated with the E2SS wetlands includes: Jesuit's bark, eastern baccharis, (*Baccharis halimifolia*), cosmopolitan bulrush, bushy seaside tansy, smooth cordgrass, saltgrass, seaside goldenrod, and broadleaf cattail

As noted in table 5, the Project would impact approximately 5.5 acres of wetlands with 2.8 acres being affected temporarily. Temporary construction impacts on wetlands could include the loss of herbaceous vegetation; wildlife habitat disruption; soil disturbance associated with grading, trenching, and stump removal; sedimentation and turbidity increases; and hydrological profile changes. Approximately 2.7 acres of wetlands would be permanently filled due to the aboveground facilities and access roads.

Natural would limit impacts on wetlands from construction and operation of the Project by adhering to its Procedures. Due to the extent of wetlands in the vicinity of the Project and the installation of parallel 36-inch-diameter suction/discharge pipelines, Natural stated that the use of a 75-foot-wide construction right-of-way, as required by FERC's Procedures, was impractical and could not be constructed safely. Natural requested the use of a proposed 125-foot-wide right-of-way to accommodate the installation of two, parallel lines. In addition, Natural needs additional space to accommodate the larger-diameter pipelines, the storage of topsoil, and the likelihood of encountering saturated or unconsolidated soils. In loose soils, the trench tends to expand, requiring additional width. It should be noted that the LDWF recommended that the pipeline right-of-way width not exceed 75 feet for construction and 30 feet for permanent impacts in wetlands. However, based on our experience with other pipelines constructed in the region and under similar conditions, we conclude that the right-of-way width requested by Natural is appropriate. Importantly, we also note that the area affected by this modification is limited to the small distance crossed by the suction/discharge pipelines and that these impact would be largely short-term. Lastly, we note that as these are emergent wetlands, no permanent impacts would occur due to the maintenance of the right-of-way during operations. Consequently, Natural's use of a 50-foot permanent easement versus a 30-foot permanent easement would not be expected to result in additional environmental impacts. Based on the justification presented by Natural, we approve this modification to our Procedures.

Natural has demonstrated through workspace configuration, siting, and design adjacent to the existing industrial facilities, specialized construction techniques, and implementation of BMPs, that impacts to wetlands would be minimized.

Table 5 Wetland Resources Crossed or Otherwise Impacted by the Project					
Feature ID	**Wetland Type [a]**	**Project Facility**	**Crossing Method**	**Temporary Impacts (acres)**	**Permanent Impacts (acres)**
WP1CA01_E2EM	E2EM	CS 348	Timber mat	0.060	0.000
			Fill	0.00	1.34
		Suction / Discharge Pipelines	Open-cut	0.18 [b]	0.00 [b]
		Access Road 3	Timber mat / Air bridge	0.06	0.00
WP1CA001_E2SS_C	E2SS	CS 348	Timber mat	0.07	0.00
			Fill	0.00	0.001
WP1CA001_E2SS_F	E2SS	CS 348	Fill	0.00	0.84
WP1CA001_E2SS_G	E2SS	CS 348	Timber mat	0.07	0.00
			Fill	0.00	0.001
WP1CA005_E2EM	E2EM	CS 348	Timber mat	0.66	0.00
		Tie-in Facility	Timber mat	0.26	0.00
			Fill	0.00	0.43
WP1CA005_E2SS_C	E2SS	CS 348	Timber mat	0.89	0.00
WP1CA002	E2EM	Access Road 2	Fill	0.00	0.08
Subtotals				*2.8*	*2.7*
Project Construction Workspace Total				**5.5**	

[a] Cowardin Wetland Types: E2EM - estuarine intertidal emergent; E2SS - estuarine intertidal scrub-shrub.

[b] Impacts on E2EM wetlands within the new permanent suction/discharge ROW would be temporary, as these wetlands would be allowed to revert back to pre-existing conditions following construction.

Prior to any construction, Natural would install erosion and sedimentation barriers that would be maintained throughout construction. Natural would also minimize the compaction and rutting of wetlands by using low ground-pressure equipment and/or by the temporary installation of timber equipment mats. In addition, Natural would segregate the topsoil where hydrologic conditions permit.

Following restoration, all wetlands that would be temporarily affected would be monitored in accordance with Natural's Procedures and with protocols specified by the applicable permitting agencies. Revegetation would be monitored periodically for the first three years or until restoration is complete. If revegetation is not successful, Natural would develop and implement a remedial revegetation plan.

B.3.6 Agency Consultation and Permitting

The Project would impact wetlands and waterbodies subject to Section 404 of the Clean Water Act (CWA). The USACE is the delegated authority for permitting under Section 404 of the CWA. Natural has submitted an Individual Section 404 Permit from the USACE. In addition, in Louisiana Section 401 of the CWA has been delegated to the LDEQ. The Section 401 permit would be obtained in conjunction with the Section 404 permit. Natural stated that they would purchase the appropriate amounts of mitigation credits, as determined by the Office of Coastal Management (OCM) and the USACE, for the permanent impacts to wetlands. Once it is completed, Natural would file a final compensatory mitigation plan with the FERC.

The USACE requires applicants to demonstrated avoidance of a regulated feature, to demonstrate minimization of impact to features that could not be avoided, and mitigation for loss of function and value of wetlands affected by a project. Through facility siting and construction and equipment workspace configuration, Natural minimized adverse impacts to jurisdictional waters of the United States to 2.7 acres of permanent impacts.

Based on the mitigation measures stated above, we conclude that impacts on wetlands would not be significant.

B.4 Vegetation, Wildlife, Migratory Birds, Special Status Species, and Fisheries

B.4.1 Vegetation

The Project is located in the ecological Southeastern Mixed Forest Province and the Outer Coastal Pain Mixed Forest Province Eocregions (USDA, 2018a). Construction and operation of the Project would affect primarily herbaceous and scrub-shrub

vegetation. Field surveys were completed in February 2018. A summary of the impacts to each of these vegetative cover types is provided in table 6.

Table 6 Summary of Habitat Impacts (acres)

Facility	Herbaceous and Shrub Wetland		Upland Herbaceous Land	
	Const.	Op.	Const.	Op.
CS 348	4.5	2.2	0.25	0.03
Tie-In Facility	0.69	0.43	0.00	0.00
Suction/Discharge Pipelines	0.18	0.0	<0.01	<0.01
X-L8E South Valve	0.00	0.00	0.00	0.00
Contractor/Staging Yards	0.00	0.00	0.00	0.00
Access Roads	0.14	0.08	0.01	0.01
PROJECT TOTAL	**5.5**	**2.7**	**0.26**	**0.04**

The Project would temporarily impact 18.5 acres of industrial land and impact 0.5 of these acres during operation. This land consists of sparse or no vegetation due to the presence of impervious surfaces and is not considered here. The Project would impact 5.5 acres of wetlands during construction and would affect 2.7 acres during operation. acres during operation. As mentioned in Section B.3.5 wetlands within the Project footprint are identified as E2EM and E2SS. Lastly, the Project would impact 0.26 acre of open upland land during construction and 0.04 acre during the operation of the Project. This land includes non-forested areas that are not classified as agricultural such as existing utility easements and unimproved pastures. Dominant vegetation within open land in the Project area consists of Japanese honeysuckle (*Lonicera japonica*), yaupon (*Ilex vomitoria*), sugarberry (*Celtis laevigata*), Bermudagrass (*Cynodon Dactylon*), sawtooth blackberry (*Rubus argutus*), eastern baccharis, southern dewberry (*Rubus trivialis*), gulfdune paspalum, Hercules' club (*Zanthoxylum clava-herculis*), white clover (*Trifolium repens*), common reed (*Phragmites australis*), Brazilian vervain (*Verbena litoralis* var. *brevibracteata*), bushy bluestem (*Andropogon glomeratus*), and Texas prickly pear (*Opuntia lindheimeri*).

As noted above, Project activities would result in the temporary loss of vegetation and the permanent conversion of vegetation from one type to another or to impervious surfaces. The loss and conversion of vegetation could affect soils and wildlife. To avoid and minimize these affects, Natural would implement measures described in the FERC Plan and Natural's Procedures to restore/revegetate affected land. Natural would also implement management strategies to minimize the spread of non-native and invasive plan species.

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 Wildlife

Existing Resources

Common wildlife species within the Project areas include coyote (*Canis latrans*), river otter (*Lontra canadensis*), swamp rabbit (*Sylvilagus aquaticus*), fulvous harvest mouse (*Reithrodontomys fulvescens*), eastern wood rat (*Neotoma floridana*), nutria (*Myocastor coypus*), white-faced ibis (*Plegadis chihi*), white-fronted goose (*Anser albifrons*), olivaceous cormorant (*Phalacrocorax brasilianus*), Gulf Coast salt marsh snake (*Nerodia clarkii*), Gulf Coast toad (*Incilius valliceps*), Gulf Coast pig from (*Rana gryli*), diamondback terrapin (*Malaclemys terrapin*), Mediterranean gecko (*Hemidactylus turcius*), Texas horned lizard (*Phrynosoma cornutum*), and American alligator (*Alligator mississippiensis*)

Construction and operation of the Project would result in short- and long-term impacts on wildlife. Potential short-term impacts on wildlife include the displacement of individuals from construction areas and adjacent habitats and the direct mortality of small, less mobile mammals, reptiles and amphibians that are unable to leave the construction area. Long-term impacts would include permanent conversion of scrub-shrub habitats to cleared and maintained right-of-way, and periodic disturbance of wildlife during operation and maintenance. In addition, noise associated with the operation of CS 348 would be permanent and may impact wildlife. However, the noise levels would attenuate with distance from the facility and CS 348 would be located adjacent to similar existing operational noise sources such as the SPL Terminal and the KMLP meter station.

On January 17, 2018, Natural requested information concerning the rookeries of colonial nesting birds from the Louisiana Natural Heritage Program (LNHP). The LNHP responded on May 4, 2018 and indicated that the closest rookery is located 10 miles from the Project area. However, the LDWF stated that there is a bird nesting colony within one mile of the X-L8E Valve Site. Natural stated that all work associated with the valve site involves minor modifications to an existing facility over a short period of time. No tree clearing would occur as a result of the Project and Natural would complete the work at the valve site during the identified non-nesting season. In addition Natural would coordinate with the LDWF prior to starting construction at the X-L8E South Valve if any work would occur during the nesting season and evidence of nesting colonies are observed.

Natural also stated that artificial lighting would be needed during construction and at CS 348 during operation. This lighting can adversely impact wildlife. However, Natural stated as the Project would be constructed adjacent to the SPL terminal which uses artificial lighting, the impacts to wildlife from the additional Project lighting would be minimal.

Based on the timing of Project construction, the presence of similar habitats adjacent to and in the vicinity of construction activities, and the implementation of the FERC Plan and Natural's Procedures, we conclude that construction and operation of the Project would not significantly impact wildlife.

B.4.3 Migratory Birds

Migratory birds are species that nest in the United States and Canada during the summer and then migrate to and from the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S. Code 703-711), and bald and golden eagles are additionally protected under the Bald and Golden Eagle 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, and nests.

Executive Order 13186 (66 FR 3853) was enacted in 2001 to, among other things; ensure that environmental analyses of federal actions evaluate the impacts of actions on migratory birds. 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 United States Fish and Wildlife Service (USFWS). The environmental analysis should further emphasize species of concern, priority habitats, and key risk factors, and that particular focus should be given to population-level impacts.

On March 30, 2011, the USFWS and the Commission entered into a Memorandum of Understanding (MOU) that focuses on avoiding or minimizing adverse impacts on migratory birds and strengthening migratory bird conservation through enhanced collaboration between the Commission and the USFWS. 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.

The entire Project would be within Bird Conservation Region 37 (Mississippi Alluvial Valley). The 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. BCC located within Bird Conservation Region 37 were provided as an appendix in Natural's application. Of the 42 BCCs that existing within BCR 37, 5 do not have ranges that exist in the Project area, 24 only would occur in the Project area as occasional migrants or during winter, 8 would occur year round, and 6 have breeding ranges that extend into the Project area.

The primary concern for impacts on migratory birds is mortality of eggs and/or young as mature birds could avoid active construction. To minimize disturbance to migratory bird critical nesting periods, Natural designed the Project to avoid the felling of trees. In addition, Natural anticipates completing vegetation clearing activities outside of the primary bird nesting season (April 15 through August 1).

Based on the characteristics and habitat requirements of wildlife and migratory birds known to occur in the proposed Project area, the amount of similar habitat adjacent to and in the vicinity of the Project, and Natural's implementation of the FERC Plan and its Procedures, we have determined that the Project would not result in population-level impacts or significant measurable negative impacts on migratory birds.

As an additional conservation measure, Natural states that if vegetation clearing would occur during the bird nesting season, Natural would conduct pedestrian nest surveys of the Project area. These surveys would be conducted by qualified biologists a maximum of two weeks prior to construction. Any unoccupied nests would be handled in accordance with the USFWS *Migratory Bird Permit Memorandom* and any occupied nests would be flagged and avoided. If a nest cannot be avoided, Natural would coordinate with the USFWS to determine if site-specific mitigation measures are appropriate.

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.

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. Nine federally listed species, including four that are also state-listed, could potentially occur in the Project area. One additional state-listed species, the brown pelican (*Pelecanus occidentalis*), was also identified. These species are listed in table 7.

Table 7 Federal and State Listed Threatened and Endangered Species Potentially occurring within the Project Area						
Common Name	**Scientific Name**	**Federal Status [a]**	**State Status [b]**	**Habitat Description**	**Habitat Assessment**	**Determination of Effect**
Mammals						
West Indian manatee	*Trichechus manatus*	T	E	Occurs in warm, shallow coastal waters, estuaries, lagoons and rivers. Prefers a very slow moving current and require areas with seagrass beds or other aquatic vegetation for food.	No portions of the Project area would cross shallow estuaries or seagrass beds.	*No Effect*
Birds						
Piping plover	C*haradrius melodus*	T	T	Breeds along sandy upper beaches with scattered grass tufts, sparsely vegetated shores, shallow lakes, ponds, rivers, and impoundments. Nests can also be found on sandy open flats or behind dunes. Winters along ocean beaches, algal flats in protected bays, and sandy mudflats.	Species only occurs in the Project area during the winter, and no suitable wintering habitat is present within Project area.	No *Effect*
Red knot	*Calidris canutus*	T	NL	Found along seacoasts on tidal flats and beaches and occasionally in marshes and flooded fields. Nesting occurs on the ground typically in inland areas near water.	Suitable wintering habitat exists in the Project area; however, individuals potentially present during construction would likely avoid the area or displace to similar adjacent habitats.	*No Effect*
Brown pelican	*Pelecanus occidentalis*	DL	E	Primarily inhabits coastal waters and are rarely found inland or far out to sea. They often nest on coastal islands and feed in shallow estuarine waters close to shore.	Suitable habitat may be present in the Project area; however, the species is highly mobile and would likely relocate to similar adjacent habitats.	*Not Likely to Adversely Affect*
Interior Least Tern	*Sternula antillarum athalassos*	E [c]	E	Breeds on sandy or gravelly beaches, found on the coasts of bays, estuaries, lagoons, beaches, lakes, and rivers.	Species only occurs in the Project area during breeding, and no suitable breeding habitat is present within Project area.	*No Effect*

E – Endangered; T – Threatened; NL – Not Listed; DL – Delisted.

[a] Federal listings for threatened and endangered species were obtained from the USFWS's IPaC System (2018a).

[b] State listings for threatened and endangered species were obtained from the LDWF Species by Parish List (2018c).

[c] Interior least tern is federally listed in Cameron Parish; however, this species in only considered for wind energy projects.

Based on field surveys and review of available information, Natural determined that the Project would have no effect on all federally listed species and is not likely to affect the state listed brown pelican due to the absence of habitat. Natural utilized the USFWS Lousiana field office's online ESA Project Review and Guidance for Other Federal Trust Resources Report online tool and determined that no further action was necessary. In addition, the USFWS responded to Natural via email on May 23, 2018 that no further action was necessary due to the determination of "no effect' for the listed species. We agree with this determination. Natural also submitted a letter to the LDWF requesting concurrence with the effects determination. No response from the LDFW was received.

Eastern Black Rail

On October 9, 2018, the USFWS proposed the eastern black rail for listing as threatened under the ESA, with a final rule anticipated no later than October 2019 (83 FR 50610). Under the ESA, federal agencies are required to confer with the USFWS on agency actions that may be likely to jeopardize a proposed species. The USFWS would typically finalize or withdraw the listing about 12 months after the proposal depending on comments received; ESA protections become effective 30 days after the final listing rule is published. The eastern black rail is found in a variety of salt, brackish, and freshwater marsh habitats that can be tidally or non-tidally influenced. Within these habitats, the birds occupy relatively high elevations along heavily vegetated wetland gradients, with soils that are moist or flooded to a shallow depth (83 FR 50610). The eastern black rail requires dense vegetation cover that allows movement underneath the canopy.

Louisiana is not currently known to support a breeding black rail population (Watts, 2016). There are no confirmed breeding records, and historic observations during the breeding season are rare. Should the eastern black rail be listed, the Project would be required to complete any necessary Section 7 consultation. Because previous consultation with the USFWS did not include consideration of the eastern black rail, **we recommend that:**

- **Natural should not begin construction activities until:**

  a. Natural consults with the USFWS to determine whether Project activities could affect the eastern black rail or its habitat and files copies of all correspondence with the Secretary of the Commission (Secretary);

  b. FERC staff completes its conference with the USFWS, if required; and

  c. Natural has received written notification from the Director of the Office of Energy Projects (OEP) that construction may begin.

B.4.5 Fisheries

As mentioned above, all waterbodies crossed by the Project are identified as warmwater fisheries and were identified as either intermittent or ephemeral. No marine waterbodies would be crossed by the Project. In addition, no recreational nor commercial fishing occurs within the waterbodies crossed by the Project and no waterbodies known to support fisheries of special concern would be crossed by the Project. Based on the size and flow regime, and observations during field surveys, the waterbodies affected by the Project do not contain fishery resources. In addition, only minor in-stream disturbances would occur including the installation of culverts.

Natural stated that according to the National Oceanic and Atmospheric Administration's Essential Fish Habitat Mapper, no designated Habitat Areas of Particular Concern or Essential Fish Habitat (EFH) Areas are located within the Project area. However, all tidally-influenced estuarine emergent and scrub-shrub wetlands are considered EFH.

Natural initiated consultation with NFMS on May 18, 2018 regarding impacts on EFH. On June 27, 2018, NMFS stated that the impacts associated with the Project do not appear to be in tidal wetlands and that NMFS had no additional comments to make on EFH impacts.

To minimize impacts on any fisheries resourced and aquatic habitat in the Project area, Natural would adhere to the FERC Plan and its Procedures. Once construction is complete, streambeds and banks would be restored to pre-construction conditions and contours. Artificial lights may impact aquatic species during construction. However, these impacts would be localized and temporary. As mentioned above, hazardous materials would not be stored within 100 feet of surface waterbodies. Lastly, Natural would install matting, silt fence, inceptor diversions, energy dissipation devices, and sediment filters during any dewatering or hydrostatic test water discharge.

Based on the lack of fishery habitat and the mitigation measures Natural would employ at stream crossings, we do not anticipate significant impacts to fishery resources.

B.5 Land Use, Recreation, and Visual Resources

B.5.1 Land Use

Construction of the Project would affect a total of 24.3 acres including 18.5 acres of industrial land, 5.5 acres of wetlands and 0.3 acres of open land. Table 8 summarizes the land use impacts associated with the construction (temporary and permanent) and operation (permanent) of the Project.

Industrial land consists of developed land that is not characterized as residential. Industrial land affected by the Project is associated with existing roads and energy infrastructure, such as the KMLP Meter Station and Natural's X-L8E South Valve site. Of the 18.5 acres of industrial land affected by the Project, 0.5 acre of which would be utilized for operation of the proposed CS 348, Tie-in Facility, suction/discharge pipelines, and Access Road 2. Impacts on industrial land from construction and operation of the Project would not alter the current land use in these areas.

Wetlands consists of approximately 23 percent of the Project area and include E2EM and E2SS wetlands. Of the 5.5 acres of wetland affected by construction of the Project, 2.7 acres would be permanently affected by operation of the new aboveground facilities and Access Road 2, and 0.07 would be associated with the new permanent right-of-way for the suction/discharge pipelines. However, since the wetland crossed by the new suction/discharge pipelines is classified as E2EM, there would be no permanent wetland conversion associated with maintenance of the permanent right-of-way. Following the completion of construction activities, all wetlands associated with temporary workspace and within the permanent right-of-way would be allowed to revegetate and revert to pre-construction conditions in accordance with Natural's Procedures.

Open land accounts for approximately one percent of the Project area, and a total of 0.3 acre of open land would be used for construction of the Project, including 0.04 acre of new permanent impacts associated with operation of the new CS 348, permanent right-of-way for the suction/discharge pipelines, and Access Road 2. The new permanent right-of-way along the suction/discharge pipelines would be maintained in an herbaceous state and would not result in a change of land use. Operation of CS 348 and the permanent expansion of Access Road 2 would result in the conversion of open land to industrial. Temporary impacts on open land would be short-term and minor. After completion of construction activities, disturbed upland areas would be reseeded in accordance with the FERC Plan and using species recommended by the local NRCS.

Table 8 Summary of Land Use Impacts (acres)								
Facility	**Industrial**		**Wetlands[a]**		**Open Land**		**Project Total**	
	Construction	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**	**Construction**	**Operation**
CS 348	3.2	0.4	4.5	2.2	0.3	0.03	7.9	2.6
Tie-In Facility	0.3	0.03	0.7	0.4	0.00	0.00	1.0	0.5
Suction Discharge Pipelines	0.06	0.05	0.2	0.07[c]	,<0.01	<0.01	0.2	0.1
X-L8E South Valve	0.11	0.00	0.00	0.00	0.00	0.00	0.1	0.00
Contractor Staging Yards	11.0	0.00	0.00	0.00	0.00	0.00	11.0	0.00
Access Road	3.9	0.03	0.1	0.08	0.01	0.01	4.1	0.1
Project Total	18.5	0.5	5.5	2.7	0.3	0.04	24.3	3.3

Note: Land affected during construction is inclusive of operation impacts (permanent). Land affected during operation consists only of new permanent impacts. Operational land associated with wetlands have been calculated based on the proposed 50-foot-wide permanent easement for the new suction and discharge pipelines.

[a] The impacts presented here for wetlands are based on land use mapping. They may differ slightly from the acreages presented in Section B.3.5 because those are based on field delineations, which are more precise than land use mapping.

Project Facilities

The current land uses at the proposed CS 348 primarily consist of wetlands and industrial land as well as minor amounts of open land. Natural would enter into long-term agreements to lease the parcels of land for operation of CS 348 and the Tie-in-Facility. After the completion of construction, temporary workspaces located outside of existing or proposed permanent facilities would be restored to pre-construction contours and allowed to revegetate.

The Tie-in Facility would be located east of the proposed CS 348 facility and directly adjacent to Natural's existing NGPL Tap. Construction of the Tie-in Facility would impact a total of one acre of wetlands and industrial land. After completion of construction, Natural would expand the existing NGPL Tap facility security fencing by 0.4 acre to include the operational footprint for the proposed Tie-in Facility.

In addition, Natural would construct new 36-inch-diameter parallel suction and discharge pipeline connecting CS 348 and the Tie-in Facility to Natural's existing Louisiana Line Nos. 1 and 2, as well as to the SPL Terminal via the existing NGPL Lateral. Construction of the suction and discharge pipelines would require a 125-foot-wide construction right-of-way, encompassing a total of 0.24 acre of wetlands, industrial, and open land. Following construction, contours would be restored to pre-construction conditions in temporary workspaces, and areas disturbed by construction that are not part of the new permanent Tie-in Facility would be allowed to revegetate. Natural proposes to maintain a 50-foot-wide shared permanent easement, requiring 0.12 acre, along the parallel suction and discharge pipelines for operation and maintenance purposes. The new permanent easement would be maintained in accordance with the FERC Plan and Natural's Procedures.

The Project would also require modifications at the existing X-L8E South Valve, with 0.11 acre utilized for construction activities; however, all work would be conducted within the existing facility limits. Therefore, the proposed modifications at the existing X-L8E South Valve would be limited to previously disturbed areas and would not require any new permanent impacts.

Contractor/Staging Yards

Natural would use two contractor/staging yards in the vicinity of the Project to accommodate material storage, equipment staging, and vehicular parking. Contractor/staging yards would require a total of 11.0 acres of industrial land during construction of the Project. Both contractor/staging yards would be restored to pre-construction conditions upon completion of construction.

Access Roads

Access roads utilized during construction would allow for the passage of a wide range of vehicles, including high clearance vehicles and heavy trucks. A total of five access roads, requiring a total of 4.0 acres of land, would be used during Project construction. Four access roads (ARs 1, 2, 4, and 5) proposed for use during Project construction are located along existing gravel roads. Natural would continue to use the existing facility access roads (ARs 1, 2, 4, and 5) to provide operational access to CS 348, the Tie-in Facility, and the existing X-L8E South Valve. AR-3 is not located along an existing road, traverses wetlands located between the existing KMLP Meter Station and Duck Blind Road, and would be used for temporary access to the Project area during construction of CS 348. Wetlands affected by AR-3 would be restored to pre-construction conditions upon completion of the Project.

Two access roads (ARs 2 and 3) would require the use of temporary air bridges to allow for the safe passage of construction equipment and vehicles over existing culverts and pipelines. AR-2 would be permanently expanded by approximately 0.12 acre to accommodate operational access to CS 348. Table 9 provides details regarding these access roads including the access road ID, proposed use and existing uses, upgrade requirements, length, and width.

Table 9 Proposed Access Roads

ID	Proposed Use	Existing Use	Upgrade requirements	Approximate Length (feet)	Approximate Width (feet)
AR-1	Temporary and permanent access to CS 348 and Tie-in Facility	Existing gravel road	None	4,751	35
AR-2	Temporary and permanent access to CS 348	Existing gravel road / Wetland / Open land	Air bridge / Permanent expansion of road entrance	349	25
AR-3	Temporary access to CS 348	Wetland	Air bridge	60	30
AR-4	Temporary and permanent access to Tie-in Facility	Existing gravel road	None	76	20
AR-5	Temporary access to X-L8E South Valve	Existing gravel road	None	127	30

Road and Major Utility Crossings

The suction and discharge pipelines would cross Duck Blind Road, which is a private gravel road that would be utilized for Project access (AR-1). In addition, the suction and discharge pipelines would cross two utility lines, including an existing

buried natural gas pipeline owned by Cheniere Creole Trail Pipeline, L.P. and an overhead electric power line. Duck Blind Road and the existing pipeline would be crossed via the open-cut method.

Residential and Planned Development

No future planned developments have been identified to date within one mile of the Project area (Morales, 2018). No residential land occurs within the Project area, and the closest residence is located 1.6 miles southwest of CS 348.

Construction of the Project may result in short-term impacts on nearby residential areas, including increased construction-related traffic on local roads as well as noise generated during construction. However, potential construction related impacts on residential areas in the Project vicinity would be minimized through implementation of the measures outlined in the FERC Plan and Natural's Project-specific Fugitive Dust Plan to reduce dust and noise during construction activities. Therefore, we conclude that impacts from construction of the Project are anticipated to be minimal and consistent with operations of existing surrounding facilities.

B.5.2 Public Land, Recreation, Other Designated or Special Use Areas

The Project does not cross and is not located within 0.25 miles of any National Park System Units, which include national parks, monuments, preserves, historic sites, historical parks, memorials, battlefields, military parks, cemeteries, recreation areas, seashores, lake shores, rivers, parkways trails, and other designations (National Park Service, 2018a,; 2018b; 2018c).

Two National Wildlife Refuge (NWRs) and two state parks are located in the Project vicinity, including Texas Point NWR (1.71 miles southwest of AR-1), Lacassine NWR (0.41 mile south of X-L8E South Valve), Walter Umphrey State Park (0.97 mile west of CS 348) and Sabine Pass Battleground State Park (1.26 miles southwest of AR-1). However, construction and operation of the Project facilities are not anticipated to impact these NWRs and state parks.

The Project area at CS 348 is located 0.71 mile southeast of state-designated Public Oyster Seed Grounds in Sabine Lake (LDNR, 2018). However, due to the distance from the Project area, construction and operation of the Project would not impact Sabine Lake or the designated Public Oyster Seed Grounds.

The Project is also located within the Louisiana Coastal Zone and is subject to permitting requirements pursuant to the Louisiana State and Local Coastal Resources Management Act and in accordance with the federal Coastal Zone Management Act (CZMA). According to the maps of Coastal Management Zones from the LDNR, the

Project is located within a Coastal Management Zone (LDNR, 2012). The LDNR, OCM is responsible for permitting associated with activities occurring in the Louisiana Costal Zone. Therefore, Natural submitted a Joint Permit Application for a Coastal Use Permit to the LDNR, Office of Coastal Management May 18, 2018. The Commission may not authorize construction until a CZMA consistency determination is rendered. Therefore, **we recommend that:**

- **<u>Prior to construction</u>, Natural should file with the Secretary a copy of the LDNR's CZMA determination for the Project.**

We conclude that the construction and operation of the Project would not have an impact on recreational areas, other designated or special use lands including affecting existing land use in the region.

B.5.3 Visual Resources

The Project would not be located within any federal, state, or locally designated scenic areas, such as National Wild and Scenic Rivers and scenic roads/highways. Impacts on visual and/or aesthetic resources would primarily occur during construction as a result of the presence of construction equipment. The majority of impacts on visual resources would be temporary; however, the installation of new aboveground facilities, including CS 348 and the Tie-in Facility, would be permanent.

CS 348 would be located on an onshore elevated platform; however it is located adjacent to the existing SPL Terminal to the east, KMLP Meter Station to the north, and Sabine Pass waterway to the west and south. Therefore, the Project facilities would be consistent with the surrounding landscape, which would minimize any visual or aesthetic impairment.

Consequently, impacts on visual and/or aesthetic resources are expected to be minimal. Minor amounts of artificial lighting would be necessary during construction and to a lesser extent during operation of CS 348. The localized nature of these lighting effects in addition to the proximity of the Project to the SPL Terminal would result in negligible impacts on visual resources as a result of artificial lighting.

The new tie-in facility would be located east of new CS 348 and directly adjacent to Natural's existing tap, and therefore this facility would be consistent with the surrounding landscape, which would minimize any visual or aesthetic impairment.

Therefore, we conclude that the construction and operation of the Project would have discernable but not 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 Louisiana State Historic Preservation Office (SHPO). The survey employed surface inspection augmented by shovel testing, and included both archaeological and architectural resources. Approximately 24.5 acres were examined. As a result of the survey, no cultural resources were identified, and no further work was recommended for the Project. In a June 25, 2018 letter, the Louisiana SHPO indicated that no historic properties would be affected by the Project. We concur, 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; Chitimacha Tribe of Louisiana; Choctaw Nation of Oklahoma; Coushatta Tribe of Louisiana; Jena Band of Choctaw Indians; Kialegee Tribal Town; Mississippi Band of Choctaw Indians; Quapaw Tribe of Oklahoma; Thlopthlocco Tribal Town; and Tunica-Biloxi Tribe of Louisiana.

On April 25, 2018, the Choctaw Nation requested shapefiles of the Project area and a copy of the survey report, which Natural provided. Upon review, the Choctaw Nation indicated the Project would have "no effect," but requested to be contacted in the event of discoveries during construction. On April 25, 2018, the Kialegee Tribal Town did not object to the Project. In a letter dated April 20, 2018, the Quapaw Tribe of Oklahoma indicated the Project was outside its area of interest and therefore, did not desire to comment. In a letter dated April 25, 2018, the Thlopthlocco Tribal Town deferred to other tribes with a greater interest in the general area of the Project. No other comments have been received. We sent our NOI to these same tribes. In letters dated August 7 and 31, 2018, the Choctaw Nation requested a copy of the survey report and Project EA. As noted above, Natural provided the report to the Choctaw Nation. The EA is available on the FERC website. In a second letter dated August 6, 2018, the Quapaw Nation reiterated that the Project was outside its area of interest and therefore, did not desire to comment. No other responses to our NOI have been received from the tribes.

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

B.7 Socioeconomics

The Project is located in a predominantly industrial setting surrounded by rural and uninhabited areas within southwestern Louisiana along the Louisiana-Texas border, near the cities of Cameron Parish, Louisiana and Sabine Pass, Port Arthur, and Nederland in Jefferson County, Texas.

The Project is anticipated to have minimal adverse impacts on socioeconomic conditions as the location of the Project minimizes impacts on residential and high-density urban areas, historic areas, and business and commercial areas. In addition, the Project is located within an existing industrial area with the closest residential development more than 1.5 miles away; thereby further minimizing potential adverse impacts on socioeconomic conditions.

The Project would not result in the displacement of permanent residences or businesses. Further, the Project would not result in a significant permanent population increase because the proposed compressor station would not require any new permanent employees.

It is anticipated that approximately 50 percent of the construction workforce would consist of personnel hired locally from the Project area (i.e., would not require temporary relocation to the Project area and would reside in existing permanent housing during Project construction) and would include contract construction personnel, Natural employees, construction inspection staff, and environmental inspection staff. It is expected that the majority of both the company and contractor labor would be local workers; however, it is expected that most of the inspectors would be non-local workers due to the specialized knowledge required for these positions. Therefore, with the exception of taxes, the socioeconomic impacts would be temporary and primarily related to the construction phase.

Population, Housing and Employment

A summary of the population data and trends, including population density, for the Project area is provided in table 10. The Project is located in a more industrial and sparsely populated area.

The population density for Cameron Parish, Louisiana (5.3 persons per square mile) falls well below the national average of 87.4 persons per square mile. The nearest municipality, Port Arthur (699.8 persons per square mile), is located approximately eight miles northwest of the Project, and is significantly more concentrated than Cameron Parish in which the Project is located.

Table 10 Existing Population Conditions in the Project Area				
Location	**Population (2010 Census)**	**Estimated Population in 2016**	**Estimated Population Change Since 2010 (%)**	**Population Density (persons per square mile)**
Louisiana	4,533,372	4,681,666	3.3	104.9
Cameron Parish	6,839	6,882	0.3	5.3
Cameron	406	224	-39.9	IU
Source: U.S. Census, 2010 IU – information unavailable				

Educational, health, and social services comprise the largest percentage of industry in Cameron Parish and Jefferson and Orange Counties (U.S. Census, 2016). Table 11 provides the unemployment rate in the City of Cameron (0.0 percent) is lower than the unemployment rates in Cameron Parish (3.5 percent), Jefferson County (7.3 percent), Orange County (7.5 percent), the State of Louisiana (7.7 percent), the State of Texas (6.4 percent), and the national average (7.4 percent) (U.S. Census, 2016).

Table 11 Existing Socioeconomic Conditions in the Project Area					
Country/State/County/Parish/City	**Per Capita Income (U.S. Dollars 2016)**	**Median Household Income (U.S. Dollars 2016)**	**Civilian Labor Force**	**Unemployment Rate (Percent of Civilian Labor Force)**	**Major Industry**
Louisiana	25,515	45,652	2,194,054	7.7	Educational, health, and social services
Cameron Parish	31,007	65,679	3,384	3.5	Educational, health, and social services
Cameron	26,201	35,000	102	0.0	Retail trade
Source: U.S. Census, 2016					

During the construction phase, the Project would require temporary housing for construction workers. It is anticipated that construction of the Project would require a

maximum of approximately 80 workers, with approximately 50 percent of these workers being non-local. The peak population change in Cameron Parish and Jefferson and Orange counties, Texas would equal the total number of non-local construction workers, plus any family members accompanying them, although most non-local workers are expected to come alone. Assuming that approximately 20 percent of the 40 anticipated non-local workers bring three family members with them, the total increase in the population of the affected region would be approximately 64 people. This temporary increase of 64 people would be short-term and would not significantly impact the population in Cameron Parish, or in Jefferson and Orange counties, Texas. In addition, there would be no new permanent employees required to operate the proposed CS 348 and Tie-in Facility, as these facilities would be operated remotely.

The rental housing vacancy rate in the Project area is 16.3 percent in Cameron Parish and 20.0 percent in the City of Cameron, which is located approximately 33 miles east of the Project (U.S. Census, 2010). Since the Project is located in a predominantly industrial and rural area, the majority of the available temporary housing is found in the cities of Beaumont, which is located approximately 25 miles northwest of the Project area; Nederland, which is located approximately 14 miles northwest of the Project; and Port Arthur, which is located approximately eight miles northwest of the Project. The cities of Beaumont, Nederland, and Port Arthur have rental housing vacancy rates of 10.6, 9.4, and 13.2 percent, respectively (U.S. Census, 2010). There are a total of approximately 728 units available for seasonal, recreational, or occasional use within commuting distance (approximately 30 miles) of the Project in the cities of Sabine Pass, Port Arthur, Nederland, Beaumont, Bridge City, Orange, Rose City, and Vidor, Texas. Given the number of hotel/motel rooms and campsites available in communities within commuting distance of the Project, construction crews should not encounter difficulty in finding temporary housing. Therefore, there would be no long-term impacts on housing as a result of the Project.

Public Services

Sufficient medical, fire, and police services are readily available in the Project area and have the capacity to manage the temporary influx of Project construction personnel with negligible impacts on public services.

Economy and Tax Revenues

Construction activities would have a net positive impact on local and regional businesses. Natural estimates that approximately $7.5 million would be distributed in construction payroll, of which approximately $1.5 million would likely be used by construction personnel for goods, services, and entertainment. Natural also estimates that approximately $1.3 million would be spent locally and/or regionally for construction materials and fuel.

Calculation of property tax revenues would be subject to the state, county, and local taxes upon completion of construction. It is anticipated local sales tax revenues from the construction of the Project are estimated to be approximately $176,750.

Environmental Justice

Construction and operation of the Project would not have a disproportionately high or adverse human health, socioeconomic, or other environmental effects on minority or low-income communities. We performed an EJScreen within 5 miles of the Project and it indicated that the Project area is relatively sparsely populated, no residential lands would be affected, and while general construction general construction and operational disturbances (e.g., noise, dust) to landowners and residents may occur, they would not be directed toward any particular segment of the population due to the Project area being located adjacent to existing industrial areas and open water.

Based on the information presented above and due to the size of the Project, we conclude that the Project would have minimal socioeconomic impacts on population, employment and income, housing, public services, economy and tax revenues.

B.8 Air Quality and Noise

B.8.1 Air Quality

Federal and state air quality standards are designed to protect human health. The U.S. Environmental Protection Agency (EPA) has developed National Ambient Air Quality Standards (NAAQS) for criteria air pollutants such as oxides of nitrogen (NO_x) and carbon monoxide (CO), sulfur dioxide (SO_2), and inhalable particulate matter ($PM_{2.5}$ and PM_{10}). $PM_{2.5}$ includes particles with an aerodynamic diameter less than or equal to 2.5 micrometers, and PM_{10} includes particles with an aerodynamic diameter less than or equal to 10 micrometers. The NAAQS were set at levels the EPA believes are necessary to protect human health and welfare. Volatile organic compounds (VOC) and hazardous air pollutants (HAP) are also emitted during fossil fuel combustion.

Greenhouse Gases (GHG) produced by fossil-fuel combustion are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). GHGs status as a pollutant is not related to toxicity. GHGs are non-toxic and non-hazardous at normal ambient concentrations, and there are no applicable ambient standards or emission limits for GHG under the Clean Air Act. During construction and operation of the Projects, these GHGs would be emitted from construction equipment and fossil fuel combustion equipment like turbines and engines. Emissions of GHGs are typically expressed in terms of CO_2 equivalents (CO_{2e}).

Operation of the CS 348 would be the primary source of long-term air quality impacts associated with the Project. In addition to the compression equipment, Natural would be installing certain auxiliary facilities at the new CS 348 that are considered ancillary emission sources, including an emergency generator, a small heater, and storage tanks. Additional emissions would result from natural gas venting and fugitive emissions from natural gas equipment leaks.

The following section outlines the existing environment; the federal regulations applicable under the Clean Air Act; the need for air quality permits; the magnitude and impact of construction emissions, and the magnitude and impact of operational emissions from the Project.

Existing Environment

The new CS 348 would be constructed adjacent to the existing KMLP Meter Station and just west of the SPL Terminal. The site would be located in an area of attainment with the NAAQS. The SPL Terminal activities are operated under an air quality permit issued by the LDEQ and the area around the SPL Terminal was determined by LDEQ to comply with the NAAQS.

Existing, or ambient, background levels of criteria pollutants within the Project region were obtained from the EPA AirData system (EPA, 2018f). Ambient monitoring in Louisiana is coordinated by the LDEQ and ambient monitoring in Texas is coordinated by the Texas Commission on Environmental Quality (TCEQ). The monitored values in the dispersion modeling assessment were obtained from the EPA AirData on-line database for the most recent three-year (2015-2017) period.

Air Quality Control Regions and Attainment Status

Air Quality Control Region (AQCR), as defined in Section 107 of the Clean Air Act (CAA) is a federally-designated area in which federal ambient air quality standards must be met. EPA designates the attainment status of an area for each criteria pollutant based on whether an area meets the NAAQS. Areas that meet the NAAQS are termed "attainment areas." Areas that do not meet the NAAQS are termed "nonattainment areas". Areas for which insufficient data are available to determine attainment status are termed "unclassified areas." Areas formerly designated as nonattainment areas that have subsequently reached attainment are termed "maintenance areas."

Cameron Parish, Louisiana is located in the Southern Louisiana-Southeast Texas Interstate AQCR (EPA, 2018b). Cameron Parish is currently designated as an attainment area for all criteria pollutants (EPA, 2018c).

Federal Air Quality Requirements

The CAA (42 U.S.C 7401 et seq., as amended in 1977 and 1990), and 40 CFR Parts 50 through 99 provide the federal statutes and regulations governing air pollution in the United States. With the exception of the new CS 348, there are no federal or state air permitting requirements applicable to any Project components.

Title V of the CAA requires states to establish an air operating permit program. The Title V Operating Permit Program, as described in 40 CFR Part 70, requires major sources of air emissions to obtain a federal operating permit. The major source emissions thresholds for determining the need for a Title V operating permit are: 100 tons per year (tpy) of any regulated air pollutant, 10 tpy of any individual hazardous air pollutants (HAPs), or 25 tpy for all HAPs, and 100,000 tpy for GHG (expressed as CO_{2e}). More stringent major source thresholds apply for VOC and NO_x in ozone nonattainment areas, namely 50 tpy of VOC or NO_x in areas defined as serious, 25 tpy in areas defined as severe, and 10 tpy in areas classified as extreme. As indicated in Tables 13 and 14, potential emissions associated with CS 348 are less than the major thresholds established under 40 CFR Part 70. Since CS 348 does not meet the definition of a major source, a Part 70 permit would not be required for this facility.

Construction Emissions

Air quality impacts associated with construction of the Project would include emissions associated with fossil-fueled construction equipment, fugitive dust from land clearing and vehicles traveling on unpaved and paved roads. All air quality impacts would generally be temporary and localized. Large earth-moving equipment and other vehicles that are powered by diesel or gasoline engines are sources of combustion-related emissions including GHGs (as CO_2e), NO_x, CO, VOC, SO_2, PM_{10}, $PM_{2.5}$, and small amounts of HAPs such as formaldehyde.

Construction emissions from the Project are shown in table 12.

Table 12 Summary of Potential Construction Emissions for the Project

Emissions (tons)								
NOx	**CO**	**SO2**	**PM_{10}**	**$PM_{2.5}$**	**VOC**	**CO2e**	**Formaldehyde**	**Total HAP**
21.7	9.3	0.045	28.9	4.3	2.3	5,937	0.051	0.167

Emissions would occur over the duration of the construction activity. As stated, impacts from construction equipment would be temporary and would not result in a significant impact on regional air quality or result in any violation of applicable ambient

air quality standard. Potential impacts would be mitigated and minimized, as described below.

State air quality regulations generally require reasonable precautions to prevent earth/soil from becoming airborne. Natural would employ common construction to control fugitive dust emissions during construction as outlined in Natural's Fugitive Dust Control Plan. All areas temporarily disturbed by construction would be stabilized and restored to pre-construction conditions to the maximum extent practicable; therefore, fugitive dust emissions during construction of the Project would be minor, of short duration, and not significant.

Fugitive dust suppression measures would be proactively implemented as necessary to protect persons (general public and Project workforce) and property from air pollution and nuisances caused by the generation of fugitive PM (dust) emissions

Vehicle emissions would be controlled through on-site management practices, in accordance with the applicable state requirements, such as state inspection and maintenance program rules.

General Conformity

General conformity regulations in 40 CFR Part 93, Subpart B, are designed to ensure that federal actions that occur in nonattainment and maintenance areas do not interfere with a state's ability to attain or maintain compliance with NAAQS. As discussed, the areas where the Project facilities would be located are in attainment/unclassifiable (considered attainment) for all criteria pollutants; therefore, a General Conformity analysis would not be required.

Operational Emissions

The primary emission source associated with CS 348 would be the Titan 130 unit, which is rated to deliver 22,490 horsepower (hp) of compression at ISO standard conditions and capable of delivery 24,714 hp at site conditions and an ambient temperature of 0 ^{0}F. Other emission sources would likely include a natural gas-fired emergency generator with a rating of 1,183 hp, a natural gas catalytic heater and 3,780-gall storage tanks for condensate and oily water. VOCs and GHGs would also be emitted from activities such as compressor venting and purges as well as fugitive equipment leaks.

Table 13 summaries the average hourly and annual potential emission rates of criteria pollutants, GHGs, and HAPs associated with CS 348. CS 348 is in an attainment area, and would be below the Prevention of Significant Deterioration (PSD) permitting and would not be a Title V major source. Natural submitted to LDEQ the State Minor

Source Air Permit application and received an Administrative Completeness Determination on May 21, 2018. Table 14 summaries the Potential Hazardous Air Emission Rates associated with CS 348.

CS 348 would be located in an attainment area, and is anticipated to be below the threshold requirements for PSD permitting, and would not be a Title V major source. The new CS 348 is adjacent to the SPL Terminal. The Project would allow SPL to obtain access to additional feed stock gas. The Project is not related to an expansion of the existing SPL Terminal and does not involve the construction of any new mainline or lateral pipeline. SPL is the Project shipper and the immediate consumer of the gas that Natural would be delivering to SPL, through the existing and proposed firm transportation capacity utilized under the proposed Project.

In previous environmental reviews, the Commission has considered the impacts of the SPL Terminal on climate change. Construction and operation by SPL of Trains 1 through 4 at the SPL Terminal, the Commission previously found that it "cannot determine the project's [i.e. - Trains 1-4] incremental physical impacts on climate change on the environment or determine whether the project would result in significant impacts" (see *Sabine Pass Liquefaction, LLC, et al.,* 139 FERC ¶ 61,039, P 92. (2012)).

With the exception of any natural gas utilized at the SPL Terminal in support of the liquefaction process, we conclude that the majority of the natural gas to be delivered by Natural to SPL through the firm transportation capacity utilized under the Project would be liquefied at the SPL Terminal and ultimately exported overseas. No physical changes or changes in the method of operation are being made by SPL at the SPL Terminal. All emissions at the SPL Terminal have already been previously accounted for in the Commission's previous orders authorizing the construction of Train 1 through 6.

Table 13 Potential Criteria Pollutant and GHG Emission Rates for CS 348									
Emission Source	**NO_x**	**CO**	**VOC**	**SO_2**	**$PM_{2.5}$ / PM_{10}**	**CO_2**	**CH_4**	**N2O**	**GHG (CO_{2e})**
Annual Potential Emissions (tpy)									
Turbine - Titan 130 Unit	46.44	47.12	5.40	2.62	5.09	90,268	1.70	0.17	90,361
Emergency Generator	0.07	0.29	0.11	2.5E-04	0.004	61	0.001	9.5E-05	61
Bruest Fuel Gas Heater	0.58	0.49	0.03	0.003	0.04	692	0.01	0.001	693
Storage Tanks	-	-	0.07	-	-	-	-	-	-
Condensate Loading	-	-	0.10	-	-	-	-	-	-
Equipment Leaks	-	-	0.45	-	-	-	13.13	-	328
Compressor Venting/Purges	-	-	2.33	-	-	-	214.16	-	5,354
Stations Venting	-	-	0.31	-	-	-	28.63	-	716
Turbine Startup/Shutdown	0.23	20.28	0.23	-	-	125	-	-	125
Facility-Wide Totals	**47.31**	**68.18**	**9.03**	**2.63**	**5.14**	**91,145**	**257.63**	**0.17**	**97,637**

[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 thresholds requiring a Minor Source Permit in the State of Louisiana are taken from LAC 33:III.Chapter 5.

Table 14 Potential Hazardous Air Pollutant Emission Rates for CS 348								
Emission Source	**Acetaldehyde**	**Acrolein**	**Benzene**	**Formaldehyde**	**n-Hexane**	**Toluene**	**Xylenes**	**Total HAP**
Annual Potential Emissions (tpy)								
Turbine - Titan 130 Unit	0.099	0.004	0.002	1.859	-	0.016	0.008	1.991
Emergency Generator	-	-	-	-	-	-	-	-
Bruest Fuel Gas Heater	0.004	0.002	1.9E-04	0.051	4.8E-04	1.8E-04	8.0E-05	0.058
Storage Tanks	-	-	1.2E-05	4.3E-04	0.010	2.0E-05	-	0.011
Condensate Loading	-	-	3.2E-04	-	0.002	8.5E-04	2.1E-04	0.004
Equipment Leaks	-	-	-	-	-	-	-	-
Compressor Venting/Purges	-	-	0.004	-	0.016	0.007	0.002	0.028
Stations Venting	-	-	0.040	-	0.086	0.061	0.010	0.197
Turbine Startup/Shutdown	-	-	0.005	-	0.011	0.008	0.001	0.026
Facility-Wide Totals	**0.102**	**0.006**	**0.052**	**1.911**	**0.126**	**0.094**	**0.021**	**2.315**

Air Quality Modeling

To ensure that emission from CS 348 would not adversely affect local air quality, an air quality dispersion modeling assessment was conducted using modeling methods approved by the EPA and LDEQ. The modeling was conducted using the latest version of the EPA-approved AERMOD model (version 16216r) along with the meteorological data compiled thought AERMET. The purpose of the AERMOD model was to evaluate the cumulative air impacts of the proposed CS 348. The modeling suggests that the new sources planned for installation at CS 348 would result in impacts less than significant impact levels (SIL) for each pollutant and well below ambient standards and therefore would not adversely affect local air quality or violate a NAAQS.

Emissions of NO_2, CO, PM_{10}, $PM_{2.5}$, and SO_2 were modeled for the Turbine Titan 130 Unit and Emergency Generator. The results of the modeling are shown in table 15 which indicate that none of the modeled pollutants have the potential to exceed the respective SIL or NAAQS. Therefore, the operational emissions and subsequent ambient concentrations of regulated pollutants planned to be emitted from CS 348 would not significantly affect local or regional air quality.

Table 15 Dispersion Modeling Results for CS 348

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)	Significant Impact Level ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Ambient + Modeled ($\mu g/m^3$)
CO	1-hour	111	2000	40000	992.6
	8-hour	97	500	10000	635.1
NO_2	1-hour	4.5	7.5	188	45.3
	Annual	0.09	1	100	6.5
PM_{10}	24-hour	1.05	5	150	44.1
$PM_{2.5}$	24-hour	1.05	1.2	35	19.1
	Annual	0.049	0.2	12	7.6
SO_2	1-hour	0.63	7.9	196	164.7
	24-hour	0.11	5	365	33.6
	Annual	0.006	1	80	3.4

B.8.2 Noise

Regulatory Noise Requirements

Noise quality can be affected both during construction and operation of the 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.

The EPA has determined that an L_{dn} of 55 dBA adequately protects the public from indoor and outdoor activity noise interference. FERC's regulations require that the noise attributable to any compressor station, compression added to an existing station, or any modification, upgrade or update of an existing station, must not exceed an L_{dn} of 55 dBA at noise sensitive areas (NSAs). NSAs include residences, schools and daycare facilities, hospitals, long-term care facilities, places of worship, libraries, and parks and recreational areas especially known for their solitude and tranquility, such as certain wilderness areas. An L_{dn} of 55 dBA is equivalent to a continuous noise level of 48.6 dBA.

Compressor unit blowdowns (gas venting) can occur during initial construction/testing, operational startup and shutdown of the compressor or maintenance activities, and for emergency purposes. During construction and testing of the station, there is an increased frequency of blowdowns to ensure the facility would be operated reliably and safely. Blowdowns during compressor startup/shutdown would be infrequent as normal operation does not require venting and units are in pressurized state to facilitate operation. Occasional maintenance and startup/shutdown blowdowns can occur. To minimize the impact of blowdown noise from the maintenance activity, Natural would control the blowdown rate to minimize the noise contribution and would conduct blowdowns during daylight hours. Full compressor station blowdowns would only occur during an emergency event, are very infrequent, and are typically less than 5 minutes in duration.

The proposed CS 348 would be located in Cameron Parish, Louisiana. Cameron Parish has a local noise ordinance that states the following, "No person shall make, continue, or cause to be made or continued any loud, unnecessary or excessive noise which unreasonably interferes with the comfort and repose of others within the parish"

(Cameron Parish Police Jury, 1997). This ordinance is qualitative and does not include quantitative sound level limits; therefore, the FERC sound level limit has been used as the design basis for the Project, as it is considered to be compatible with residential land uses and adequate to prevent any unreasonable interference with comfort or repose.

The Cameron Parish ordinance specifically prohibits construction and demolition activities within 165 feet of any residential property or NSA during certain hours (Cameron Parish Police Jury, 1997). There are no residences or other NSAs located within 165 feet of the Project area; therefore, Project activities will comply with this ordinance.

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

Construction Noise

Short-term increases in sound levels could occur during construction of CS 348. Only standard construction equipment will be used in the construction of CS 348, with no dynamic compaction expected. To be conservative in the construction noise calculations, all Project construction equipment, with the exception of the light plants, was included in the noise model as operating during both day and night. The light plants will only be used during nighttime activities. The highest sound levels during construction are expected during the early site preparation phase. Table 16 shows a summary of predicted short-term sound levels at the NSAs during construction activities.

Table 16 Sound Level Impact Evaluation – Construction Noise from the Project

NSA	Measured Ambient Levels (dBA)			Estimated Construction Levels (dBA)			Combined Construction and Ambient Levels (dBA)			Potential Increase Above Ambient (dBA)		
	Day L_{eq}	Night L_{eq}	L_{dn}	Day L_{eq}	Night L_{eq}	L_{dn}	Day L_{eq}	Night L_{eq}	L_{dn}	Day L_{eq}	Night L_{eq}	L_{dn}
1	54.7	50.7	58.0	39.1	39.4	45.7	54.8	51.0	58.2	0.1	0.3	0.2
2	49.9	42.1	50.9	31.8	32.1	38.5	50.0	42.5	51.1	0.1	0.4	0.2
3	54.7	56.3	62.5	45.4	45.7	52.0	55.2	56.7	62.9	0.5	0.4	0.4

Pile Driving

Piles would be used as the structural foundation for the new elevated platform on which CS 348 equipment will be located. Natural is evaluating various potential methods

for pile installation, including impact hammers, cast-in-drilled hole, or DeWaal piles. As the impact hammer would be the loudest and have the most significant noise impact, it was used as the basis for the noise evaluation.

The sound level of a diesel-driven impact hammer is 101 dBA (L_{max}) at 50 feet based on measured values from the Federal Highway Administration (FHWA) Construction Noise Handbook (2006). This sound level corresponds to a sound power Level of 136 dBA (L_{max}). In order to estimate the long-term equivalent sound level during pile driving, a usage factor of 10 percent has been applied to the L_{max} to estimate the L_{eq}. The resulting long-term sound power level is an L_{eq} of 126 dBA.

Pile driving would be conducted by no more than two pile driving rigs over the course of approximately four months, and pile driving activities will generally occur during daytime hours. However, weather conditions, site conditions, specialized construction techniques, emergencies, or other atypical circumstances may necessitate nighttime work or extended work. Therefore, noise from pile driving was evaluated on a 24-hour basis. Because pile driving is a short-term impulsive noise source, the analysis was performed for the average day, average night, and 24-hour L_{dn}, along with the short-term L_{max} level from pile driving. The L_{max} represents the highest level for any given single pile driving event, while the L_{eq} or L_{dn} is the average due to pile driving over the course of the full day, night, or 24-hour L_{dn} period.

Table 17 shows the predicted sound levels due to pile driving, construction, and the combination of pile driving and construction activities and it indicates that the combined sound level for construction and pile driving activities ranges from 34.9 to 47.7 dBA L_{eq} during day and night construction. These sound levels are lower than the FERC sound level target for operations noise and would not be expected to have a significant adverse noise impact at any NSAs.

The L_{max} sound levels from pile driving activities, the highest expected sound level during any given pile driving event, range from 39.0 to 50.4 dBA (L_{max}). At NSA 3, it is likely that pile driving would be clearly audible. However, the L_{max} sound levels are lower than the existing day and night ambient levels at this NSA, and the impact of the pile driving sound is expected to be minimal.

Based on the analyses conducted and mitigation measures proposed, we conclude that the construction and operation of the Project would result in no significant noise impacts.

Table 17 Sound Level Impact Evaluation – Pile Driving Activities and General Construction for the Project															
Measured Ambient Sound (dBA)			**Estimated Pipe Driving Levels (dBA)**			**Combined Pile Driving/Construction Levels (dBA)**			**Combined Pile Driving/Construction L_{eq} and Ambient Levels (dBA)**			**Potential Increase Above Ambient (dBA)**			**Pile Driving L_{max} (dBA)**
Day	**Night**	**L_{dn}**	**Day**	**Night**	**L_{dn}**	**Day**	**Night**	**L_{dn}**	**Day**	**Night**	**L_{dn}**	**Day**	**Night**	**L_{dn}**	
54.7	50.7	58.0	35.4	35.4	41.8	40.6	40.9	47.2	54.9	51.1	58.3	0.2	0.4	0.3	42.6
49.9	42.1	50.9	31.9	31.9	38.3	34.9	35.0	41.4	50.0	42.9	51.4	0.1	0.8	0.5	39.0
54.7	56.3	62.5	43.4	43.4	49.8	47.5	47.7	54.0	55.5	56.9	63.1	0.8	0.6	0.6	50.4

Operational Noise

Based on the scope of the Project, the operational noise would be limited to the vicinity of the proposed CS 348 site. CS 348 would be located in Cameron Parish, approximately 2.0 miles northeast of the City of Sabine Pass, Texas. The area surrounding CS 348 consists of primarily industrial land associated the SPL Terminal.

Natural would implement noise control measures to minimize noise for the site. The following is a list of noise control measures that would be implemented:

- turbine intake and exhaust systems;
- one lube oil cooler;
- three suction process gas filter/separators;
- four electric-motor-drive gas aftercoolers, including a total of 12 fans;
- an emergency generator;
- unit suction and discharge valves and piping;
- a fuel gas ski;
- a case vent with silencer; and
- station emergency shut-down vents.

A baseline noise survey was conducted for the proposed CS 348 site to identify nearby noise sensitive areas (NSA) relative to CS 348. An acoustical analysis was performed to predict the Station sound level contribution at the closest NSAs and to develop recommended noise control treatments for the Station equipment. Computer noise modeling predicts that the Station contributions at the NSAs would below the FERC limit of 55 dBA L_{dn} after the construction of the proposed compressor station equipment with the noise control treatments. Table 18 provides a summary of the ambient sound levels in the vicinity of the proposed CS 348 site, predicted sound level contribution of CS 348 equipment at the nearby NSAs, and a prediction of the overall environmental sound levels after the addition of the compressor station equipment with proposed noise control treatments.

Table 18 Sound Level Impact Evaluation – Operations Noise from CS 348

NSA	Distance to NSA (feet)	Direction to NSA	Measured Ambient L_{dn} (dBA)	Estimated Contribution of Station L_{dn} (dBA)	Combined Station L_{dn} and Ambient L_{dn} (dBA)	Potential Increase Above Ambient (dB)
1	8,200	SSW	58.0	35.0	58.0	0.0
2	9,900	SSE	50.9	32.1	51.0	0.1
3	5,100	W	62.5	42.3	62.5	0.0

Natural intends to implement noise control measures to ensure that noise levels from CS 348 does not exceed the existing noise level. However, to ensure that new CS 348 does not exceed the existing noise levels at any nearby NSAs, **we recommend that:**

- **Natural should file a noise survey with the Secretary no later than 60 days after placing the new CS 348 in service. If a full horsepower load condition noise survey is not possible, Natural should file an interim survey at the maximum possible horsepower load and provide the full load survey within 6 months. If the noise attributable to the operation of all of the equipment at the CS 348 under interim or full horsepower load conditions exceeds existing noise levels 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 6 months 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.**

B.9 Reliability and Safety

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

The pipeline and aboveground facilities associated with the project must be designed, constructed, operated, and maintained in accordance with the 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 DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. For example, Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues, prescribes the minimum standards for operating and maintaining pipeline facilities, and incorporates compressor station design, including emergency shutdowns and safety equipment. Part 192 also requires a pipeline operator to establish a written emergency plan that includes procedures to minimize the hazards in a natural gas pipeline emergency.

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

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

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

B.10 Cumulative Impacts

For purposes of the cumulative impacts assessment, the proposed CS 348, Tie-in Facility, and suction/discharge pipelines were evaluated as a single Project area as new Project facilities. Due to the limited scope of the proposed modifications at the existing X-L8E South Valve, activities at this site are not anticipated to contribute to cumulative impacts on resources. Therefore, the proposed modifications at the existing X-L8E South Valve are not included in the cumulative impact analysis for the Project.

The CEQ regulations for implementing NEPA, at 40 CFR 1508.7, define cumulative impacts as: "impacts on the environment which result from incremental impact of the [proposed] action when added to other past, present, and reasonably foreseeable future actions…." .

The current environment of the Project area reflects a mixture of natural processes and human influences across a range of conditions. Current conditions have been affected by innumerable activities over thousands of years, as explained below. The CEQ issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which stated: "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.' In order to understand the contribution of past actions to the cumulative effects of the proposed action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. In this analysis, we generally consider the impacts of past projects within the resource- specific geographic scopes as part of the affected environment (environmental baseline), which was described under the specific resources discussed throughout section B. However, this analysis does include the present effects of past actions that are relevant and useful.

In accordance with the CEQ regulations for implementing NEPA, we identified other actions located in the vicinity of the Project and evaluated the potential for a cumulative impact on the environment. This analysis evaluates other actions that impact resources also affected by the Project, within the resource-specific geographic scopes described below. Actions located outside the geographic scopes are generally not evaluated because their potential to contribute to a cumulative impact diminishes with increasing distance from the Project.

As described throughout this EA, the Project would temporarily and permanently impact the environment. We found that most impacts would be temporary and short-term during construction and restoration of the Project. Permanent impacts would occur at aboveground facilities and permanent new access roads. However, we conclude that with the mitigation measures proposed by Natural or imposed as staff recommended conditions, or by other agency permits, impacts would not be significant.

Our review of the estimated Project impacts concludes that nearly all construction impacts would be contained within the right-of-way and extra workspaces. Erosion control measures included in FERC's Plan, for example, would keep disturbed soils within work areas. Consequently, most of the construction impacts would be temporary and localized and are not expected to contribute to regional cumulative impacts. Exceptions exist where the impacts may migrate outside of designated work areas.

In general, the area of effect of a proposed project would depend on the scope and size of the project (i.e., larger projects would impact a larger area; smaller projects, a smaller area). Furthermore, the geographic scope may also differ for each resource (e.g., for waterbody and wetland impacts, the area of effect may be a particular watershed; whereas, for air emissions, the area of impact may be a particular region or attainment/non-attainment).

A basic assumption of the cumulative impacts is that if there are no Project-related impacts for a particular resource, there would be no cumulative impacts for that resource. Based on the analysis presented in this EA, we have eliminated from further discussion under cumulative impacts the following resource categories: groundwater, fisheries, geologic resources, and cultural resources.

As discussed in Section B.3 Water Resources, potential impacts on groundwater resources are expected to be highly localized and minor. Furthermore, Natural would implement measures outlined in the Project-specific SPRP in the event of an accidental spill of hazardous material or fuel, or unanticipated discovery of existing contamination, which would minimize potential impacts.

Groundwater withdrawals would not be required for the Project, except as necessary for trench dewatering during construction; the Project does not overlie Source

Water Protection Areas; no public or private water wells are within 150 feet of the Project area; and the southwestern portion of Cameron Parish, where CS 348 and adjacent Project facilities are located, does not contain fresh groundwater within the confining unit of the aquifer (USGS, 2002). Therefore, the proposed Project is not expected to adversely impact groundwater quality or supply and no cumulative impacts on groundwater resources are anticipated.

The Project would require four waterbody crossings. None of the waterbodies are perennial and all but one is less than 10 feet wide. Based on the size and flow regime, and observations during field surveys, the waterbodies affected by the Project do not contain fishery resources.

As discussed in section B.1, Project construction and/or operational impacts on fuel and non-fuel mineral resources and paleontological resources are not anticipated and the Project is not anticipated to be affected by or contribute to potential geologic hazards. Therefore, no cumulative impacts on geologic resources are anticipated.

No cultural resources were identified within the Project area surveyed for cultural resources, therefore, the Project would not contribute to cumulative impacts on cultural resources.

Geographic Scopes

Appendix 1 lists the Project with other past, present, and reasonable foreseeable future projects identified within the geographic scope of the Project, and shows the potential cumulative effects of all projects, to the extent that specific impact information is available. Table 19 lists the resource-specific geographic scopes that are appropriate to assess cumulative impacts, based on the impacts of the Project as identified and described in the EA and consistent with CEQ guidance.

Table 19 Geographic Scope for Resources Affected by the Project

Resource	Geographic Scope	Rationale
Water Resources and Wetlands, Vegetation, Wildlife	Watershed Boundary (HUC 12)	The geographic scope used to assess cumulative impacts on waterbodies, groundwater, and wetlands includes the HUC-12 watershed within which the Project facilities would be located and may be affected by the proposed Project activities.
Socioeconomics	Cameron Parish and Jefferson County	Cumulative impacts on socioeconomic, including traffic-related impacts, were evaluated for the parish in which the Project is located and the county where construction workers would possibly reside.

Table 19 Geographic Scope for Resources Affected by the Project		
Soil	Area of disturbance associated with the Project.	Impacts on soil resources are generally localized to the immediate work area. Therefore the geographic scope for soils includes projects within the same construction footprint.
Land Use, Recreation, and Aesthetics	1 mile	Impacts on land uses, recreation, and aesthetics generally occur within and adjacent to projects areas. Based on the proposed Project size and scope and the generally uniform character of the surrounding area, a 1-mile buffer is anticipated to account for impacts on land uses, recreational areas, and viewsheds that would be experienced by people in the flat to gently undulating terrain in the Project vicinity.
Air and Noise Quality[1]	50 kilometers /approx. 31.1 miles (air quality – operations)	We adopted the distance used by the EPA for cumulative modeling of large PSD sources during permitting (40 CFR 51, appendix W) which is a 50-kilometer radius for a qualitative analysis. Impacts on air quality beyond 50 kilometers (31.1 miles) would be reduced to below concern.
	0.25 mile (air quality – construction)	Due to the limited amount of emissions generated by construction equipment, the geographic scope used to assess potential cumulative impacts on air from construction activities was set at 0.25 miles.
	NSAs within 1 mile that would have overlapping noise impacts	Noise impacts are highly localized and attenuate quickly as the distance from the noise source increases. Noise impacts from aboveground facilities are evaluated at all noise sensitive areas within 1 mile.
	0.25 mile (noise – construction)	Noise impacts would be limited to immediate vicinity of compressor station and pipeline construction. Noise impacts from construction are evaluated at all noise sensitive areas within 0.25 mile.
[1] We note that GHGs do not have a localized geographic scope. GHG emissions from the Project combine with projects all over the planet to increase CO_2, methane and other GHG concentrations in the atmosphere.		

Surface Water and Wetland Resources

As identified in Appendix 1 the following other projects occur within the HUC 12 watershed.

- Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC) Project
- SPLNG Third Berth Expansion Project
- Liquefaction Expansion Project (Sabine Pass Liquefaction Expansion, LLC)
- SH 87 Shoreline Projection Project (Texas Department of Transportation – Beaumont District)

KMLP's Sabine Pass Expansion Project components that occur within the same watershed as the proposed Project include a new 36-inch-diameter tap and approximately 1,200 feet of new 36-inch-diameter pipeline lateral. SPL's Liquefaction Expansion Project components that occur within the same watershed include the use of Duck Blind Road (AR-1) for project access as well as portions of contractor/staging yards. A portion of the residential subdivision associated with Pebble's Oak Ridge at Johnson Bayou Project is located within the watershed.

The Project, in addition to the other projects within the geographic scope, may have cumulative impacts on surface water resources. As discussed in Section B.3 Water Resources, the Project would have four waterbody crossings. In-stream activities, such as the installation of permanent culverts, have the greatest potential for impacts on surface water resources. These impacts include increased turbidity and sedimentation in the vicinity of the culvert installation and immediately downstream. The impacts could contribute to a cumulative impact if conducted concurrently with in-water activities of other projects considered. However, impacts associated with in-water activities would be short-term with water quality quickly returning to ambient conditions following the completion of the culvert installation.

Increased construction and industrial operation activities in and around surface waterbodies could result in an increased potential for spills of hazardous materials. Similar to the proposed Project, other projects would also be required to adhere to regulations associated with the use and storage of hazardous materials to minimize the potential for spills of hazardous materials to reach surface waters. Therefore, the potential for cumulative impacts as a result of spills of hazardous materials is considered to be negligible, as spills are not anticipated and would have to occur within the same general timeframe and within the same general area to result in a cumulative impact.

Concurrent construction of projects involving clearing, grading, or other earthwork may also increase the potential for cumulative impacts on water quality from increased stormwater runoff. Although workspace associated with KMLP's Sabine Pass Expansion Project would overlap with one of the proposed contractor/staging yards and AR-1, construction and restoration of these areas is anticipated to be complete in spring 2019 for the Sabine Pass Expansion Project and would not overlap with the Project construction schedule. In addition, KMLP's Sabine Pass Expansion Project facilities would not result in impacts on any waterbodies within the same HUC 12 as the proposed Project; therefore, KMLP's Sabine Pass Expansion Project would not contribute to cumulative impacts on surface water and wetland resources within the geographic scope for the proposed Project.

The construction of Pebble's Oak Ridge at Johnson Bayou Project is ongoing, and the specific limits of disturbance and construction schedule are dependent on the

purchase of lots within the residential subdivision boundary. Therefore, it can be reasonably assumed that residential construction activities associated with Pebble's Oak Ridge at Johnson Bayou Project could occur within the same watershed simultaneously with Project activities. In addition, the use of AR-1 and both contractor/staging yards for the Project may result in a temporal overlap with SPL's Liquefaction Expansion Project. If revegetation associated with these other projects is not complete at the start of construction of the proposed Project, there could be increased soil exposure within the watershed. This may increase the potential for sedimentation in surface waterbodies as a result of soil erosion, which could adversely impact water quality in the Project watershed. However, each these projects are also required to implement best management practices (BMPs) to ensure avoidance, minimization, and/or mitigation of potential impacts on surface water resources.

While surface water impacts associated with the Project could contribute to a cumulative effect when combined with other projects located within the geographic scope considered, based on the incremental impacts on surface water and the fact that none of the streams crossed by the Project are perennial, this cumulative effect is not anticipated to be significant. Overall, cumulative impacts on surface water resources are anticipated to be minor and short-term.

Wetlands

Construction and operation of the proposed Project would result in 2.8 acres of temporary impacts and 2.7 acres permanent impacts on wetland resources, as outlined in Section B.3.5. Temporary impacts are associated with wetland crossing, stormwater runoff, and potential spills of hazardous materials during construction. Permanent impacts on wetlands would be limited to those areas where construction and operation of the proposed facilities results in the placement of fill material in wetlands.

Increased construction and industrial operation activities in and around wetlands could result in an increase in sedimentation and spills of hazardous materials. Similar to the proposed Project, other projects would also be required to adhere to regulations associated with the use and storage of hazardous materials to minimize the potential for spills of hazardous materials to reach wetlands. Therefore, the potential for cumulative impacts as a result of stormwater runoff and spills of hazardous materials is considered to be minimal.

Natural would minimize the temporary impacts associated with construction of the Project by implementing measures outlined in the FERC Procedures, such as topsoil segregation in non-saturated wetlands, utilizing mats in saturated wetlands, and returning the wetlands that would not be permanently affected to pre-construction contours upon completion of the Project.

As discussed for cumulative impacts on surface water resources above, all project proponents are subject to regulation by the United States Army Corps of Engineers (USACE) under the CWA, and are required to implement BMPs to ensure avoidance, minimization, and/or mitigation of potential impacts on wetland resources.

The SPLNP Third Basin Project would permanently impact approximately 27.7 acres of wetlands while SPL's Liquefaction Expansion Project would permanently impact approximately 153.5 acres. KMLP's Sabine Pass Expansion Project is not expected to affect wetlands and the exact amount of wetland impacts from the Pebble's Oak Ridge at Johnson Bayou Project is unknown.

Although we have limited data identifying the wetland impacts of the other projects within the HUC 12 watersheds affected by the Project, the other projects are also subject to the minimization and requirements of the USACE. Based on the minimal permanent impact of the Project and the abundance of similar habitat in the Project vicinity, we conclude that construction and operation of the Project and other projects in the same watershed would result in non-significant cumulative impacts on wetlands.

Wildlife and Vegetation

Cumulative effects on vegetation and wildlife affected by the Project, could occur within the Project's HUC-12 watershed. It should be noted that the Project would have no effect on federal threatened and endangered species and as such cumulative impacts are not discussed further.

The majority of impacts on wildlife and vegetation would be associated with the temporary and permanent conversion of vegetation/wildlife habitat association with the construction and operation of the Project. The largest impacts on wildlife and vegetation would be the construction of the permanent aboveground facilities as this would convert existing upland and wetland habitat to industrial use. However, as mentioned in section B.4, 18.5 acres of land out of 24.3 total acres of land affected during construction is already industrial in nature, construction would occur outside of the primary bird nesting season, and no tree clearing would occur. In addition, impacts on wetlands would be mitigated through permit requirements under Section 404 of the Clean Water Act. Natural would also reduce impacts on wildlife and vegetation by complying with the FERC Plan and its Procedures.

Construction activities associated with TXDOT's SH 87 Shoreline Protection Project are also not anticipated to overlap with the proposed Project construction schedule. In addition, this shoreline project parallels an actively used state highway, which provides limited value for wildlife species. KMLP's Sabine Pass Expansion Project construction area may overlap with that of the proposed Project; however, construction activities associated with these components would be located entirely within

existing industrial areas with limited impacts on vegetation and wildlife. Therefore, cumulative impacts on vegetation and wildlife as a result of TXDOT's SH 87 Shoreline Protection Project, KMLP's Sabine Pass Expansion Project, and the proposed Project would not be significant.

Construction of Train 5 for SPL's Liquefaction Expansion Project is ongoing and will likely overlap with construction of the proposed Project. Where construction schedules overlap, increased noise, lighting, and human activity could also disturb wildlife in the area. However, the projects will be conducted within and/or directly adjacent to the existing SPL Terminal and most wildlife in the area is anticipated to be acclimated to human activity. Wildlife may temporarily displace to nearby suitable habitat, but are anticipated to return to those areas temporarily affected following the completion of construction activities. Therefore, cumulative impacts on wildlife and vegetation as a result of the Project and SPL's Liquefaction Expansion Project is not expected to be significant.

As mentioned above, construction of Pebble's Oak Ridge at Johnson Bayou Project is ongoing, and residential construction activities, including the clearing of vegetation and associated wildlife habitat, could occur within the same watershed simultaneously with Project activities. However, the entire Pebble's Oak Ridge at Johnson Bayou Project is expected to impact approximately 63 acres and portions of the housing development appear to be in an adjacent watershed to the Project. According to the EPA's Watershed Assessment, Tracking, and Environmental Results System the HUC-12 watershed in which the project is located is greater than 76,000 acres. As the projects cumulatively would only impact approximately 69 acres of vegetation and wildlife habitat during construction activities, cumulative impacts on wildlife and vegetation as a result of the Project and the Johnson Bayou Project is not expected to be significant.

Soils Resources

Direct effects on geology and soils are highly localized and limited primarily to the period of construction; therefore, cumulative impacts to geologic and soils resources and conditions would only occur if other projects are constructed at the same time and in the same geographic footprint as the proposed Project.

As indicated in Appendix 1, the following other projects occur within the geographic scope for geologic and soils resources and were considered in the cumulative impacts analysis:

- Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC)
- Liquefaction Expansion Project (Sabine Pass Liquefaction Expansion, LLC)

Concurrent or consecutive construction schedules could prolong the duration that soils would be disturbed and thus susceptible to erosion and invasive species establishment. Due to the soil conservation and restoration measures that would be implemented by all projects to prevent erosion and stabilize disturbed areas, cumulative impacts on soils are anticipated to be short-term and not significant. Additionally, construction of KMLP's Sabine Pass Expansion Project would be completed by the spring of 2019, prior to construction of the Project. Construction of SPL's Liquefaction Expansion Project is ongoing, and Train 5 is anticipated to be placed in-service in December 2019. As a result, construction of the Project would likely overlap with SPL's Liquefaction Expansion Project. However, neither the Project nor SPL's Liquefaction Expansion Project would require excavation or other ground disturbing activities within areas of overlapping workspace (portions of the contractor/staging yards and AR-1). Therefore cumulative impacts on soils resources would be negligible.

Socioeconomics

As indicated in Appendix 1, with respect to socioeconomics, a total of 13 identified projects are located within the geographic scope (Cameron Parish and Jefferson County) that were considered in the cumulative impact analysis. These projects range from large-scale industrial developments to small real estate developments and road improvement projects. The following list provides a brief summary of the projects considered in the analysis:

- Cameron LNG Project (Cameron LNG, LLC) -Trains 1-3
- Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC)
- SPLNG Third Berth Expansion Project
- Commonwealth LNG Project (Commonwealth LNG, LLC)
- Calcasieu Pass LNG Project (Venture Global LNG, Inc.)
- Liquefaction Expansion Project (Sabine Pass Liquefaction, LLC)
- Golden Pass LNG Expansion Project (Golden Pass Pipeline LLC and Golden Pass Products, LLC)
- Cameron access Project (Columbia Gulf Transmission, LLC)
- Port Arthur Pipeline Louisiana Connector Project (Port Arthur Pipeline, LLC)
- East-West Project (Florida Gas Transmission Company, LLC)
- Lake Arthur Development – Phase I (James W. Ethridge)
- Lake Arthur Development – Phase II (James W. Ethridge)
- Oak Ridge at Johnson Bayou (Pebble, LLC)
- South Grand Chenier Marsh Creation – Baker Tract (ME-32) (U.S. Fish and Wildlife Service)
- SH 87 Shoreline Protection Project (Texas Department of Transportation – Beaumont District)

- I-10 Road Widening Project Phase I (Texas Department of Transportation – Beaumont District)
- I-10 Road Widening Project Phase II (Texas Department of Transportation – Beaumont District)

Employment

There are currently concerns of worker shortages in the southwest Louisiana region due to the recent industrial development boom. The construction schedules associated with a number of the large industrial projects considered in the cumulative assessment are expected to overlap with construction of the proposed Project, which could create some challenges in recruiting local workers. However, the number of workers required to construct the proposed Project is relatively minor compared to these large industrial projects. Although SPL's Liquefaction Expansion Project (FERC Docket No. CP13-552-000) involves the expansion of the SPL Terminal and is a large industrial project that is in the immediate vicinity of the proposed Project and is expected to overlap with the Project construction schedule, it is anticipated to be fully staffed at the time of construction of the proposed Project. Therefore, it is anticipated that there would be local workers available in the region.

Port Arthur Liquefaction Project (PALP) estimates the peak construction workforce to occur in month 32, and would be about 3,000 workers. PALP estimates that up to 20 percent of construction workforce could be hired locally (i.e., from Jefferson and Orange Counties in Texas and Cameron Parish, Louisiana), 20 percent would commute daily from outside the project area, and 60 percent would be non-local (i.e., traveling more than 150 miles), relocating to the area for the length of their employment. After construction, 200 permanent jobs would be created at the liquefaction facility. This would be a small increase for the population of Jefferson County, and PALP anticipates that 70 percent (140 persons) of the permanent employees would be hired locally.

Housing

Due to the rural and non-residential setting in the immediate Project vicinity, it is anticipated that the non-local Project construction workforce would utilize temporary housing within the larger cities and surrounding areas located in Jefferson County, Texas, including Port Arthur, Nederland, and Beaumont. Cumulative impacts of worker influx from multiple projects could have the effect of increased rental rates and shortages in housing if demand outstrips supply of suitable lodging. While beneficial to the housing market, this could adversely affect those seeking housing and could result in longer commutes for workers if they are unable to obtain housing near their place of work.

SPL's Liquefaction Expansion Project is located in the immediate vicinity of the proposed Project, and it is anticipated that the project's non-local workforce would utilize the larger cities located in Jefferson County. SPL anticipates that approximately 60 percent of the Liquefaction Expansion Project workforce would be non-local workers and would need temporary housing; however, SPL expects many of the construction workers would double-up and utilize RV parks located in Johnson Bayou, as evident during construction of the SPL Terminal. Trains 5 and 6 are in the construction phase with an in-service date of 2019 anticipated. The Liquefaction Expansion Project concludes that no negative impacts on housing resources are anticipated during the remaining construction of the project.

Several large industrial projects considered in the cumulative assessment are located more than 30 miles from the proposed Project, and it is anticipated that non-local workers associated with these other projects would temporarily reside in cities located within commuting distance of each project. The additional projects that overlap with construction of the proposed Project are small scale road and housing development projects being constructed primarily by local contractors.

We conclude that the projects would not contribute to a long-term negative cumulative impact on the local housing market, although short-term negative impacts are likely.

Transportation

Road traffic in the area would increase during the construction phase of the proposed Project. A majority of the large industrial projects considered in the cumulative assessment are located approximately 30 miles east of the proposed Project in Cameron Parish and would not result in traffic congestion on major roads to be utilized for access to the Project area. However, SPL's Liquefaction Expansion Project is located directly adjacent to the proposed Project, and construction traffic would utilize SH 82 and Duck Blind Road to transport construction equipment, materials, and workers to the project site. SPL projected that material deliveries for its Liquefaction Expansion Project would peak in December 2018 then decline to an average of 10 to 12 deliveries via truck per day during construction. Consequently, peak construction activities for SPL's Liquefaction Expansion Project would be completed prior to construction of the proposed Project. In addition, SPL anticipates that access to the Liquefaction Expansion Project area would primarily occur from the west in the Port Arthur, Texas area and from the east in the Holly Beach, Louisiana area; therefore, it would only result in short-term cumulative impacts on traffic.

It is anticipated that measures, such as utilizing flaggers and coordinating shift changes so that they occur during non-peak traffic hours, would be implemented by

the projects to decrease traffic congestion. Traffic from other projects that are constructed in the immediate vicinity of and during the same timeframe as the proposed Project are not expected to result in significant cumulative impacts on traffic congestion and traffic safety. Operation of the proposed Project would not contribute to traffic congestion in the area, as no permanent employees are required. Therefore, the cumulative impacts on traffic are expected to be minor and temporary in nature.

Land Use, Recreation, and Aesthetics

Impacts on land use, recreation, and aesthetics generally occur within and adjacent to the areas in which Project activities occur. The geographic scope for land use, recreation, and aesthetics is defined as the 1-mile buffer surrounding the Project footprint. The rationale is that the surrounding area is generally of uniform character and therefore the 1-mile buffer is adequate to account for impacts on land uses, recreational areas, and viewsheds that would be experienced by people in the flat to gently undulating terrain. The following other projects occur within the geographic scope for land use, recreation, and aesthetics and were considered in the cumulative analysis:

- Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC)
- Liquefaction Expansion Project (Sabine Pass Liquefaction Expansion, LLC)

Construction and operation of the Project has the potential to impact land use and visual resources. As discussed in Section B.5 of the EA the Project would not affect public land or recreation areas; therefore, the construction and operation of the Project would not contribute to cumulative impacts on public land or recreation areas. Therefore, cumulative impacts on public land and recreation areas are not further discussed in this EA.

KMLP's Sabine Pass Expansion Project components located within the geographic scope for the Project include a new 36-inch-diameter tap and approximately 1,200 feet of new 36-inch-diameter pipeline lateral. SPL's Liquefaction Expansion Project consists of the construction and operation of two additional liquefied natural gas trains (Trains 5 and 6) at the existing SPL Terminal. Activities associated with construction and operation of KMLP's Sabine Pass Expansion Project would overlap with both of the Project contractor/staging yards and AR-1, which are also being used for construction of SPL's Liquefaction Expansion Project. However, the areas that would be utilized by the three projects consist of existing industrial land and thus, would not require a change in land use. Cumulative impacts in areas where the existing land use is already classified as industrial/developed land would be negligible, as there would be no change as a result of the projects. The proposed Project and SPL's Liquefaction Expansion Project would result in changes in land use for the construction and operation of permanent aboveground facilities; however, these impacts would be relatively minor, as the projects are located in an area that is already predominantly characterized by industrial land use associated with the existing SPL Terminal.

As discussed in Section B.5.3 of the EA, the Project would result in minor impacts on visual resources due to its location adjacent to the existing SPL Terminal and other energy infrastructure. Construction and operation of the Project facilities would be consistent with the highly industrialized area in which the proposed facilities would be located. Therefore, the Project would not contribute discernably to cumulative impacts on visual resources. Similarly, the visual impacts associated with KMLP's Sabine Pass Expansion Project would be negligible due to its location adjacent to the existing SPL Terminal. In addition, SPL's Liquefaction Expansion Project involves the expansion of the existing SPL Terminal; therefore, there would be no change in the existing viewshed associated with this project. The overall cumulative impact on visual resources associated with the construction and operation of the projects would be minor due to the existing industrial nature of the areas surrounding each of the projects.

Air Quality

Potential emissions resulting from the construction of other past, present, and reasonably foreseeable projects were also examined for potential cumulative air quality impacts. The geographic scope for air quality impacts associated with construction activities was considered to be a 0.25-mile radius of the Project facilities which require large earth-moving equipment, pile driving rigs, and other vehicles for construction activities. As discussed in Section B.8.1 of the EA, the construction emissions associated with the proposed modifications at the existing X-L8E South Valve are anticipated to be negligible and were, therefore, not included in the cumulative impact analysis for air quality impacts due to construction emissions.

As identified in Appendix 1, the following other projects occur within the geographic scope of cumulative impacts for air quality impacts from construction activities and were considered in the cumulative impacts analysis:

- Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC)
- SPLNG Third Berth Expansion Project
- Liquefaction Expansion Project (Sabine Pass Liquefaction, LLC)
- Golden Pass LNG Expansion Project (Golden Pass Pipeline LLC and Golden Pass Products, LLC)

Due to the temporary and localized nature of construction activities and associated emissions, construction would have to occur within the same general timeframe to result in a cumulative impact on air quality. Construction and restoration of KMLP's Sabine Pass Expansion Project components located within the 0.25-mile geographic scope are anticipated to be completed prior to Project construction activities and thus, would not overlap with the Project construction schedule. Therefore, the Project would not

combine with construction of KMLP's Sabine Pass Expansion Project to contribute to cumulative impacts on air quality.

Construction of Train 5 of SPL's Liquefaction Expansion Project began in June 2015 and is scheduled for completion in December 2019. The construction schedule for Train 6 is unknown at this time. While most of the earth-moving and heavy equipment work associated with construction activities for Train 5 are expected to be complete by the time Project construction commences, there is the potential for cumulative impacts from concurrent construction activities for the two projects during 2019.

SPLNG proposes to construct and operate the Third Berth Project (FERC Docket No. CP19-11-000) which is an expansion of the existing Sabine Pass liquefied natural gas facility by the addition of a third marine berth and supporting facilities. The Project is currently under review by FERC staff. The third berth would be used to load LNG vessels for export and is sized to accommodate vessels with a capacity of 125,000 to 180,000 cubic meters. The supporting facilities would include tie-ins to the existing loading lines and boil-off gas lines associated with the five existing LNG tanks. The project would also include the addition of piping, piperacks, utilities, and other additional infrastructure to transport the LNG from the new tie-ins to the third berth. The construction schedule for the Third Berth Project indicates that, were it approved, construction would commence in 2020. Based on the proposed construction schedules, construction emissions could overlap.

SPL filed construction emission estimates for the Liquefaction Expansion Project with FERC in September 2013 as part of the Application and Environmental Report for the project. The construction emissions were delineated by year, with no construction emissions provided beyond 2019. Cumulative construction impacts from the two projects could occur during a period of about 10 months. Table 20 provides the estimated cumulative construction emissions from SPL's Liquefaction Expansion Project, the SPLNG Third Berth Project, and the proposed Project during the period when cumulative impacts may occur.

Any air quality impacts from construction activities would generally be temporary and localized. Cumulative impacts from overlapping construction of the projects are relatively small. As such, concurrent construction of the proposed Project and the other projects is not anticipated to result in adverse cumulative impacts on local air quality.

Table 20 Summary of Potential Cumulative Air Impacts from Construction Activities						
Construction Activity	**Emissions (tons)**					
	NO_x	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**	**VOC**
CS 348 and Tie-in Facility	21.7	9.3	0.04	28.9	4.3	2.3
SPL Liquefaction Expansion Project	17.6	72.5	0.05	88.1	9.9	3.3
SPLNG Third Berth (Year 1)	1269.3	149.8	0.65	67.3	67.3	49.3
Total	1308.6	231.6	0.7	184.3	81.5	54.9

Operational emissions such as criteria pollutants, volatile organic compounds, and hazardous air pollutants would be emitted from projects in the area. These were listed for chronic and acute health impacts due to inhalation, as well as secondary environmental effects. For these pollutants, we consider a geographic scope for cumulative impacts of up to 50 kilometers.

We do not use 50 kilometers to consider cumulative GHG emissions. GHGs were identified by the EPA as pollutants in the context of climate change. GHG emissions do not directly cause local ambient air quality impacts. GHG emissions result in fundamentally global impacts that feedback to localized climate change impacts. Thus, the geographic scope for cumulative analysis of GHG emissions is global rather than local or regional. For example, a project 1 mile away emitting 1 ton of GHGs would contribute to climate change in a similar manner as a project 2,000 miles distant also emitting 1 ton of GHGs.

As identified in Appendix 1, the following projects occur within the geographic scope of cumulative impacts for air quality impacts from operational activities and were considered in the cumulative impacts analysis:

- Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC)
- SPLNG Third Berth Expansion Project
- Liquefaction Expansion Project (Sabine Pass Liquefaction, LLC)
- Golden Pass LNG Expansion Project (Golden Pass Pipeline LLC and Golden Pass Products, LLC)
- Port Arthur Pipeline Louisiana Connector Project (Port Arthur Pipeline, LLC)
- East-West Project (Florida Gas Transmission Company, LLC)
- Delfin LNG Project Onshore Compressor Station
- Port Arthur Liquefaction Project, Texas Connector Project, Louisiana Connector Project

- Oak Ridge at Johnson Bayou (Pebble, LLC)
- SH 87 Shoreline Protection Project (Texas Department of Transportation – Beaumont District)
- I-10 Road Widening Project Phase I (Texas Department of Transportation – Beaumont District)
- I-10 Road Widening Project Phase II (Texas Department of Transportation – Beaumont District)
- SH 73 Road Maintenance (Texas Department of Transportation – Beaumont District)
- Beaumont terminal (USA Rail Terminals Beaumont Texas)
- Berth 5 Expansion Project
- SNWWW Channel Improvement Project (CIP)
- Calcasieu Parish Transportation Plan

Existing air quality in the vicinity of the planned CS 348 site, based on nearby air monitors, was determined to be in compliance with the respective NAAQS, however data from 2015-2017 shows deteriorating air quality over time. The potential emissions from CS 348 have been modeled to predict the changes in local air quality from the future facility operations. Future and current projects that are not yet operating may affect those values in the Project vicinity. Cumulative impacts can occur when other planned project emissions from nearby operating facilities are large enough to affect air quality values at the proposed activity sites. We have included operational emissions from the projects for which data are available.

Table 21 Summary of Potential Cumulative Air Impacts from Operational Activities

Project	Emissions (tons)						
	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	VOC	HAPs
CS 348 and Tie-in Facility	47.3	68.18	2.63	5.14	5.14	9.03	2.32
SPL Liquefaction Project (Trains 1-6)	2,449.0	7,390.0	12.6	62.4	62.4	2,593	NA
SPLNG Third Berth (Year 1)	261.73	414.67	72.35	14.3	13.58	58.54	0.88
Port Arthur (Liquefaction Facility Only)	1384.0	2,236.0	57.0	274.0	274.0	134.0	NA
Golden Pass LNG	717.0	142.9	656.3	50.6	50.6	82.4	44.7
Totals	**4,860**	**10,250**	**802**	**406**	**406**	**2,880**	**47.9**

NA = Data not available

Due to the proximity of the Project to the Sabine LNG facility, we examined more closely the local cumulative impacts by linearly combining modeling output data to show the cumulative impacts of the Sabine LNG facility, Third Berth Project, and CS 348. Data

for the SPLNG Third Berth Project, including the modeling results of the entire Sabine LNG Facility can be found in the FERC application under Docket Number CP19-11-000. As can be seen in table 22, there is a slight exceedance of the NAAQS for 1-hour NO_2 due to the facility combination. For all other pollutants, the results show that the impacts would be below the NAAQS. It should be noted that adding the modeling outputs linearly is a conservative approach that generally overestimate impacts due to the fact that the highest modeled impacts for each project may not occur at the same place and time. Therefore, although there would be an increase in cumulative air quality impacts with a long-term trend for worsening air quality in the area, we conclude that the incremental cumulative impact is not significant.

Table 22 Cumulative Dispersion Modeling Results

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m^3)	NAAQS (µg/m^3)
CO	1-hour	4,183.7	40,000
	8-hour	2,306.2	10,000
NO_2	1-hour	191.2	188
	Annual	46.72	100
PM_{10}	24-hour	77.04	150
	Annual	ND	50
$PM_{2.5}$	24-hour	27.25	35
	Annual	11.69	12
SO_2	1-hour	ND	196
	3-hour	ND	1300
	24-hour	ND	365
	Annual	NC	80
ND – No data for both facilities			

Noise

The geographic scope for noise was considered to be a 1-mile radius of the Project facilities with stationary noise sources. Noise impacts are highly localized and attenuate quickly as the distance from the source increases. No adverse cumulative impacts on noise would occur as a result of the proposed modifications at the existing X-L8E South Valve, as no new noise generating equipment would be installed.

As identified in Appendix 1, the following other projects occur within the geographic scope of cumulative impacts for noise quality and were considered in the cumulative impacts analysis:

- Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC)
- Liquefaction Expansion Project (Sabine Pass Liquefaction Expansion, LLC)
- Cameron LNG Project (Cameron LNG, LLC)

The KMLP Sabine Pass Expansion Project components that occur within the geographic scope for the proposed Project include a new delivery interconnect with the SPL Terminal consisting of a new 36-inch-diameter tap and approximately 1,200 feet of new 36-inch-diameter pipeline lateral. No operation noise impacts would result from these project facilities within the geographic scope considered for the proposed Project. In addition, construction and restoration of the Sabine Pass Expansion Project components within the geographic scope for the Project would be completed prior to the commencement of Project construction, therefore, construction of the KMLP Sabine Pass Expansion Project would not overlap with the Project construction and would not contribute to cumulative impacts on noise.

In the post-construction noise survey for Trains 1 through 4, which SPL filed with the Commission on November 30, 2017, SPL estimated the sound level contribution of Trains 1 through 4, operating at full load, at the nearby NSAs (SPL, 2017). Using these sound level contributions, it is possible to estimate the operational noise contributions from Trains 5 and 6 using a distance adjustment and by subtracting three dB to account for approximately half the number of noise sources as in Trains 1 through 4. Table 23 shows the cumulative sound level impact evaluation of the Operation of CS 348 and the SPL Terminal's Trains 1-6. As indicated in this table the estimated cumulative sound level of the projects is below 55 dBA L_{dn} at all NSAs, and the cumulative increase above the existing noise level ranges from 0.1 to 0.5 dB at the NSAs. Therefore, the cumulative impact of the proposed Project combined with SPL's Terminal is minimal.

Table 23 Cumulative Sound Level Impact Evaluation Operation of CS 348 and SPL Terminal Trains 1-6										
NSA	**Existing Ambient**	**Measured Sound Level Contribution of Trains 1-4, L_{dn} (dBA)[a]**	**Distance to Acoustic Center of Trains 1-4 (est)**	**Distance to Acoustic Center of Trains 5-6 (feet)**	**Distance Adjustment (dB)[b]**	**Estimated Train 5-6 Contribution L_{dn} (dBA)[c]**	**Proposed Project Contribution L_{dn} (dBA)**	**Total Cumulative Future Contribution: SPL Terminal Trains 1-6 and Project L_{dn} (dBA)**	**Total Future and Ambient L_{dn} (dBA)[d]**	**Potential Increase Above Existing (dB)**
1	58.0	47.7	7,700	9,900	-2.2	42.5	35.0	**49.0**	58.1	**0.1**
2	50.9	44.5	8,500	9,200	-0.7	40.8	32.1	**46.2**	51.4	**0.5**
3	62.5	48.4	6,700	9,300	-2.8	42.6	42.3	**50.2**	62.6	**0.1**

[a]Source: SPL, 2017.

[b] The distance adjustment is calculated using a 10*log*(distance 1 / distance 2) and assumes hemispherical spreading without atmospheric absorption or additional ground absorption losses.

[c]An additional 3 dB has been subtracted from the Train 1 – 4 contribution to account for Trains 5 – 6 having half as many noise sources as Trains 1 – 4.

[d]The ambient measurements include the operation of Trains 1 - 4, so this column is the sum of the Existing Ambient, Trains 5 - 6, and the proposed Project contribution.

SECTION C – ALTERNATIVES

In accordance with NEPA and Commission policy, we considered and evaluated alternatives to the proposed action, including the no-action alternative, system alternatives, facility alternatives, and alternative facility locations and pipeline alignments. These alternatives were evaluated using a specific set of criteria. The evaluation criteria applied to each alternative include a determination whether the alternative:

- meets the objective of the proposed Project;
- is technically and economically feasible and practical; and
- offers a significant environmental advantage 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, geographic information system data, aerial imagery) and assume the same right-of-way widths and general workspace requirements. Where appropriate, we also use site-specific information (e.g., field surveys or detailed designs).

Our environmental analysis and this evaluation consider quantitative data (e.g., acreage or mileage) and uses common comparative factors such as total length, amount of collocation, and land requirements. Our evaluation also considers impacts on both the natural and human environments.

The impacts associated with the Project were described in detail in section B of this EA. Because the alternatives represent mostly alternative locations for natural gas facilities, the specific nature of these impacts on the natural and human environments would generally be similar to the impacts described in section B. In recognition of the competing interests and the different nature of impacts resulting from an alternative that sometimes exist (i.e. impacts on the natural environment versus impacts on the human environment), we also consider other factors that are relevant to a particular alternative and discount or eliminate factors that are not relevant or may have less weight or significance.

The alternatives were reviewed against the evaluation criteria in the sequence presented above. The first consideration for including an alternative in our analysis is whether or not it could satisfy the stated purpose of the Project. An alternative that cannot achieve the purpose for the Project cannot be considered as an acceptable replacement for the Project. All of the alternatives considered here are able to meet the project purpose stated in section A.2 of this EA.

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

Alternatives that would not meet the Project's objective or were not feasible were not brought forward to the next level of review (i.e., the third evaluation criterion). Determining if an alternative provides a significant environmental advantage requires a comparison of the impacts on each resource as well as an analysis of impacts on resources that are not common to the alternatives being considered. The determination must then balance the overall impacts and all other relevant considerations. In comparing the impact between resources, we also considered the degree of impact anticipated on each resource. Ultimately, an alternative that results in equal or minor advantages in terms of environmental impact would not compel us to shift the impacts 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, 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

Implementing the No-Action Alternative would result in the proposed Project not being constructed. Not constructing the Project would avoid affecting the environment as described previously in this document. However, the objective of the Project would not be met and the identified demand for natural gas would not be satisfied. If the Project were not constructed, Natural would not be able to meet SPL's need to transport an additional 400,000 Dth/d of natural gas for delivery to the SPL Terminal. Natural's existing system does not have adequate horsepower to increase feed gas delivery pressures and Natural would be unable to meet its obligations for an additional 400,000 Dth/d of natural gas to SPL without the construction of the Project facilities. The SPL Terminal would be expected to either request that Natural provide an alternative set of facilities to meet its need or seek supplies from another provider. In either case, new

construction would occur and environmental impacts would result from that construction that may be less, the same, or more than the impacts associated with impacts of the Project. We conclude that the no-action alternative would not meet the objectives of the Project and may also not provide a significant environmental advantage over the Project, because of the additional facilities required to provide natural gas to the SPL Terminal.

C.2 System Alternatives

System alternatives are alternatives to the proposed action that would make use of other existing, modified, or proposed natural gas systems that would meet the stated objective of the proposed Project. System alternatives involve the transportation of the equivalent amount of additional natural gas volumes by the expansion of existing facility/pipeline systems or by the construction and operation of other new facility/pipeline systems. The objective of identifying and evaluating system alternatives is to determine if potential environmental impacts could be avoided or reduced by using a different pipeline system or configuration. A viable system alternative would make it unnecessary to construct Natural's Project; although, modifications or additions to its system or another system may be required. Although modifications or additions to existing systems could result in environmental impacts, this impact may be less, the same, or more than the impact associated with the Project.

In addition to the proposed Project, we evaluated three alternatives along Natural's existing natural gas pipeline system to meet the Project's purpose and need. These three alternatives are described below and include: an alternative involving increased compression at the existing CS 342, an alternative looping and increased compression at the existing CS 342, and a loop-only alternative. A comparative analysis of estimated environmental impacts for the system alternatives compared to the Project is presented in table 24.

Compression-Only Alternative (Existing Compressor Station)

We evaluated a "compression-only" alternative which consisted of installing additional compression at the existing CS 342, the last compressor station the gas currently flows through before delivery to the SPL Terminal. Installing additional compression at the existing CS 342 would allow Natural to compress the additional 400,000 Dth/d at CS 342 and discharge it into the Louisiana Line Nos. 1 and 2 at its MAOP. However, the additional 400,000 Dth/d flowing through the Louisiana Line Nos. 1 and 2 would create additional pressure drop from CS 342 to the SPL Terminal, which would still not allow Natural to deliver gas to the SPL Terminal at the requested minimum pressure of 1,050 psig. As such, the compression-only alternative, involving the addition of compression at an existing compressor station, is not a technically feasible alternative to the proposed Project.

Looping and Compression Alternative

We evaluated an alternative involving the installation of additional compression at the existing CS 342 and looping between CS 342 and the SPL Terminal to reduce the pressure drop from CS 342 to the SPL Terminal and thus allow Natural to deliver gas to the SPL Terminal at the requested minimum pressure of 1,050 psig. In order to achieve the same objectives as the proposed Project, this alternative would require installation of 36-inch- and 42-inch-diameter pipeline loop segments, totaling approximately 10.6 miles, located adjacent to the existing Louisiana Line Nos. 1 and 2.

Pipeline loop segment 1 would involve installation of 7.8 miles of 42-inch-diameter pipeline beginning at existing CS 342 and extending southwest before terminating approximately 0.7 mile northeast of the proposed site for CS 348. Pipeline loop segment 2 would involve 2.8 miles of 36-inch-diameter pipeline located adjacent to pipeline loop segment 1 and terminating at CS 342. In addition to the two pipeline loop segments, this alternative would require the installation of a new Solar Titan 130 unit, with a 22,490 ISO rating of 22,490 hp, at the existing CS 342, which is the same unit proposed for installation at CS 348 as part of the proposed Project.

The looping and compression alternative would require approximately 91 acres of additional land disturbance as compared to the proposed Project, including approximately 88 acres of additional wetland impacts. In addition, this alternative would require crossings of four major waterbodies. Further, three NSAs are located within 0.5 mile of CS 342 where installation of additional compression would be required for this alternative, as compared to the proposed site for CS 348 which is not located within 0.5 mile of any NSAs.

The looping and compression alternative would have greater impacts on land, wetlands, waterbodies, and NSAs than Natural's proposed Project, and would not offer a significant environmental advantage when compared to the Project. For these reasons, we eliminated the looping and compression alternative from further consideration.

Looping-Only Alternative

We evaluated a "looping-only" option for the Project that would require the installation of four pipeline loops, totaling approximately 90.8 miles of new 30-, 36-, and 42-inch-diameter natural gas pipelines adjacent to the existing Louisiana Line Nos. 1 and 2. This alternative would eliminate the need for construction of CS 348. Descriptions of the four loops are provided below, and a comparison of anticipated impacts with the proposed Project is provided in table 24.

Pipeline loop 1 would involve installation of 38.5 miles of 30-inch-diameter pipeline beginning at Natural's existing Compressor Station No. 302 in Montgomery County, Texas, and continuing southeast before terminating 6.4 miles northwest of Compressor Station No. 343 (CS 343) in Liberty County, Texas. Pipeline loop 2 would involve installation of 35.9 miles of 30-inch-diameter pipeline beginning at CS 343, extending southeast, and terminating in Jefferson County, Texas, approximately 9.4 miles west of the proposed site for CS 348. Pipeline loop 3 would involve installation of 8.6 miles of 36-inch-diameter pipeline beginning at the proposed site for CS 348 and extending northeast before terminating at CS 342. Pipeline loop 4 would involve installation of 7.8 miles of 42-inch-diameter pipeline, the entirety of which would be located adjacent to pipeline loop 3, beginning at CS 342 and extending southwest before terminating approximately 0.7 mile northeast of the proposed site for CS 348.

Construction of these four loops would require approximately 1,006 acres of total land disturbance, including approximately 124 acres of forest and approximately 391 acres of wetland impacts. In addition, the looping-only alternative would cross 166 waterbodies, which is significantly greater than the two waterbodies affected by the construction of the proposed CS 348 and suction and discharge pipelines. The looping-only alternative would also require crossings of the Trinity River National Wildlife Refuge in Montgomery County and the McFaddin National Wildlife Refuge in Jefferson County, which are avoided by the proposed Project. Given the significantly greater land disturbance impacts, number of wetland and waterbody crossing, and National Wildlife Refuge crossing, we conclude that the alternative would not provide a significant environmental advantage and eliminate the looping-only alternative from further consideration.

Table 24 System Alternatives Comparison			
Category	**Proposed Project**	**Looping-Only Alternative**	**Looping and Compression Alternative**
Looping (miles)	0.00	90.8	10.6
Incremental Compression (ISO hp)	22,490	N/A	22,490
Total Land Disturbance (acres) [a]	8.2	1,006	99
Land Use (acres) [a, b]			
Wetlands	4.7	391.3	93.4
Open Land	0.3	94.7	1.0
Developed	3.3	82.9	4.5
Open Water	0.00	3.8	0.09
Forest	0.00	123.0	0.00
Agricultural	0.00	310.3	0.00
Noise Sensitive Areas within 0.50 mile of Compression	0	N/A	3
Federal Lands within 0.50 mile	0	2	0
State Lands within 0.50 mile	0	2	0
Federally Listed Species Designated Critical Habitat (acres)	0.00	0.00	0.00
Waterbody Impacts [c]			
Minor Waterbodies [d]	2	90	1
Intermediate Waterbodies [e]	0	67	5
Major Waterbodies [f]	0	9	4
Total Waterbody Impacts	2	166	10
Wetland Impacts (acres) [g]			
Non-forested (PEM/PSS/E2EM/E2SS) Wetlands	4.7	348.9	93.4
Forested (PFO) Wetlands	0.00	42.5	0.00
Total Wetland Impacts	4.7	391.3	93.4

[a] Acreage presented for the proposed site and site alternatives includes temporary and permanent impacts associated with construction of CS 348 and suction/discharge pipelines. Acreage for the system alternatives assumes a 100-foot-wide nominal construction right-of-way, not including additional temporary workspace or ancillary work areas.
[b] Land use impacts for the proposed Project and system alternatives are based on aerial imagery, National Wetlands Inventory (NWI) data, and the National Land Cover Database (2011)
[c] Waterbody impacts for the proposed Project are based on field survey data. Waterbody crossings for the system alternatives were determined using the National Hydrography Dataset.
[d] Minor waterbodies are those with a crossing width of 10 feet or less.
[e] Intermediate waterbodies are those with a crossing width of greater than 10 feet and less than 100 feet.
[f] Major waterbodies are those with a crossing width of 100 feet or greater.
[g] Wetland impact acreages for the proposed Project are based on field survey data. Wetland impacts for the system alternatives were determined using NWI data.

Electric Compression Alternative

We considered electric motor-driven compression for CS 348 as an alternative to the proposed natural gas-fired turbine engine. To maintain the same operational flexibility of a single Solar Titan 130 turbine-driven compressor unit, one 25,000 hp Variable Frequency Drive-controlled motor driven compression unit would be required. SPL generates its own power to operate the SPL Terminal; however, additional electric power is not available to drive the proposed compression at CS 348. Therefore, to provide the required electrical power for the 25,000 hp electric load, Natural would have to secure an agreement with the local Co-Op electric utility, Jeff Davis Electric, to provide the required 17 Mega Volt Amp ("MVA") / 13.8 kilovolt ("kV") electric service to the proposed compressor site. This new electric service would require a transmission tap and construction of approximately 15.6 miles of 69 kV transmission line from an existing Jeff Davis Electric substation located east of CS 348. In addition, a new substation would need to be constructed adjacent to CS 348 to transform the 69 kV transmission line to the required site voltage of 13.8 kV. Construction of the substation would require approximately 1 acre of land, a 17 MVA oil filled step down transformer, dead end structure, and disconnect devices.

Given the location near the Gulf of Mexico, the proposed CS 348 has the potential to be affected by hurricanes that could knock out high voltage power transmission lines and render the compressor station unavailable for service until the transmission lines could be placed back into service. Therefore, a gas-driven turbine compressor unit minimizes the risk of long-term outages associated with electric driven system components.

An eGRID analysis was performed for the Project and it indicates that although the use of electric motors to power compressors at CS 348 might lessen some air emissions at the compressor station site itself, however it would result in emissions of air pollutants at the point of electric generation. We conclude that the use of electric motor-driven compression for CS 348 would not provide a significant environmental advantage and is less reliable. Therefore, we have eliminated electric motor-driven compressor from further consideration.

C.3 Aboveground Facility Site Alternatives

Natural conducted a hydraulic analysis and field surveys to determine the optimum horsepower and compression needed to alleviate the current capacity constraint and allow the additional 400,000 Dth/d of throughput to flow. The following considerations influence site suitability for the new compressor station facilities:

- location of existing Natural infrastructure (e.g., compressor stations, pipelines) and the length of interconnecting suction/discharge pipelines needed to connect the new compressor station to Natural's existing pipeline system;
- location of existing SPL Terminal infrastructure;
- physical facility and workspace land requirements and ability to negotiate with affected landowner(s);
- proximity to existing access points/roads;
- natural and manmade physical constraints (e.g., rivers, roadways, stormwater outfalls); and
- sensitive environmental resources (e.g., designated critical habitat, cultural resource sites, streams, wetlands).

A total of three potentially suitable sites are evaluated. To provide a comprehensive and comparative analysis of environmental impacts based on existing conditions, Natural conducted wetland and waterbody delineations, cultural surveys, and civil surveys for all three sites considered for the proposed CS 348. Table 25 presents the environmental comparison.

Alternative Site 1

Alternative Site 1 is located 0.33 mile northeast of the proposed site, and 0.06 mile southeast of the intersection of Louisiana State Highway 82 and Duck Blind Road. Construction of Alternative Site 1 would require a total of 14.1 acres, with 5.5 acres required for operation. This site is located farthest from the existing Louisiana Line Nos. 1 and 2 and the NGPL Lateral and would require a larger construction footprint due to the overall length of new suction/discharge pipelines. Alternative Site 1 would require the installation of approximately 2,045 feet and 2,017 feet of parallel suction and discharge pipelines, respectively, south of the compressor station to tie-in to the NGPL Lateral. In addition, approximately 477 feet of new pipeline would be required west of Alternative Site 1 to tie-in to the existing Louisiana Line Nos. 1 and 2. Alternative Site 1 would also utilize the least amount of existing developed land as compared to the other sites, which would require more permanent fill to stabilize the soils for construction and operation of CS 348.

Alternative Site 1 was removed from consideration due to the overall greater land disturbance and environmental impacts associated with additional suction/discharge pipeline and permanent fill requirements. We conclude that it would not provide a significant environmental advantage.

Table 25 Project Site Alternatives Comparison			
Category	**Proposed Site**	**Alternative Site 1**	**Alternative Site 2**
Total Land Disturbance (acres) [a]	8.2	14.1	8.2
Land Use (acres) [a, b]			
Wetlands [c]	4.7	9.4	3.3
Open Land	0.25	2.9	2.8
Developed	3.3	1.8	2.0
Open Water	0.00	0.00	0.09
Operation Land Disturbance (acres) [a]	2.7	5.5	2.3
Temporary Workspace (acres)	5.4	8.6	5.9
Approximate Length of Suction/Discharge Pipelines (feet)	273	4,539	814
Waterbody Impacts [d]			
Minor Waterbodies	3	1	1
Intermediate Waterbodies	1	0	2
Total Waterbody Impacts	4	1	3

[a] Acreage presented for the proposed site and site alternatives includes temporary and permanent impacts associated with construction of CS 348 and suction/discharge pipelines.

[b] Land use impacts are based on field surveys, which were conducted for the proposed site, Alternative Site 1, and Alternative Site 2.

[c] Wetland impacts are based on wetland delineations, which were conducted for the proposed site, Alternative Site 1, and Alternative Site 2. All wetlands potentially impacts by the Project and site alternatives are classified as non-forested wetlands.

[d] Waterbody impacts are based on field survey data, which was collected for the proposed site, Alternative Site 1, and Alternative Site 2.

Alternative Site 2

Alternative Site 2 is located 0.06 mile southeast of the proposed site, and 0.57 mile southwest of the intersection of Louisiana State Highway 82 and Duck Blind Road. The new elevated platform and associated support piles for Alternative Site 2 would be located within existing developed land; however, the platform would be restricted to the western half of this site due to the location of the existing NGPL Lateral, which traverses Alternative Site 2. This site would require installation of approximately 814 feet of new suction/discharge pipelines to tie-in to the existing Louisiana Line Nos. 1 and 2. The majority of these new suction/discharge pipelines

would need to be installed via bore to avoid direct impacts on an existing stormwater outfall associated with the SPL Terminal. Due to the depth of this outfall and its location relative to Duck Blind Road and the existing Louisiana Line Nos. 1 and 2, additional pipe sections would be required to complete the bore. Two bore pits, each a minimum of 50 feet long by 50 feet wide, would be required on either side of the outfall/road crossing.

Because of saturated soils, the bore pit walls would likely require shoring to minimize potential expansion or sloughing resulting from the saturated soil conditions. In addition, if the subsoil and groundwater conditions allowed a high rate of groundwater flow into the bore pipe, a large volume of water would be conveyed through the bore pipe and into the bore pit where crew and equipment are working.

Alternative Site 2 was removed from further consideration due to constructability limitations and safety risks.

Based on less land disturbance and minimal environmental impacts associated with the proposed site we conclude that Alternative 1 and 2 would not provide a significant environmental advantage.

The proposed location for CS 348 and the location of the existing Louisiana Lines Nos. 1 and 2 determined the location of the Tie-in Facility and the suction/discharge pipelines. We did not identify any alternative for these facilities and did not receive any stakeholder comments requesting an alternative.

Conclusion

After reviewing the alternatives to the proposed Project, we concluded that none of the system alternatives, electric compression alternative, above ground facility alternatives and other site alternatives would satisfy the evaluation criteria. In summary, we have determined that the proposed action, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Projects' objectives.

SECTION D – STAFF'S 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 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 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 the OEP **before using that modification.**

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

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

3. **Prior to any construction**, Natural shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel would be informed of the EI's authority and have been or would be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EA, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of**

construction, Natural shall file with the Secretary any revised detailed survey maps/sheets at a scale not smaller than 1:6,000 with station positions for the 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 facilities to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Natural shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, and 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 the OEP **before construction in or near that area**.

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

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

   a. implementation of cultural resource mitigation measures;
   b. implementation of endangered, threatened, or special concern species mitigation measures;
   c. recommendations by state regulatory authorities; and
   d. agreements with individual's landowners that affect other landowners or could affect sensitive environmental areas.

6. **Within 60 days of the acceptance of this authorization and before construction begins**, 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 instruction Natural would give to all personnel involved with construction and restoration (initial and refresher training as the project progresses and personnel change);
f. the company personnel (if known) and specific portion of Natural's organizations having responsibility for compliance;
g. the procedures (including use of contract penalties) Natural would follow if noncompliance occurs; and
h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:
    (1) the completion of all required surveys and reports;
    (2) the environmental compliance training of onsite personnel;
    (3) the start of construction; and
    (4) the start and completion of restoration.

7. Natural shall employ at least one EI for the Project. The EI(s) shall be:

a. responsible for monitoring and ensuring compliance with all mitigation measures required by the Order and other grants, permits, certificates, or other authorizing documents;
b. responsible for evaluating the construction contractor's implementation of the environmental mitigation measures required in the contract (see condition 6 above) and any other authorizing document;
c. empowered to order correction of acts that violate the environmental conditions of the Order, and any other authorizing document;
d. a full-time position, separate from all other activity inspectors;

e. responsible for documenting compliance with the environmental conditions of the Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
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 **biweekly** basis until all construction and restoration activities are complete. On request, these status reports would 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;
e. the effectiveness of all corrective actions implemented;
f. a description of any landowner/resident complaints which may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
g. copies of any correspondence received by Natural from other federal, state, or local permitting agencies concerning instances of noncompliance, and Natural's response.

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

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

11. **Within 30 days of placing the authorized facilities in service**, 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 would be consistent with all applicable conditions; or
    b. identifying which of the Certificate conditions Natural have 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 **not begin construction** activities **until**:

    a. Natural consults with the USFWS to determine whether Project activities could affect the eastern black rail or its habitat and files copies of all correspondence with the Secretary;
    b. FERC staff completes its conference with the USFWS, if required; and
    c. Natural has received written notification from the Director of OEP that construction may begin.

13. **Prior to construction**, Natural shall file with the Secretary a copy of the LDNR's CZMA determination for the Project.

14. Natural shall file a noise survey with the Secretary **no later than 60 days** after placing the new CS 348 in service. If a full horsepower load condition noise survey is not possible, Natural shall file an interim survey at the maximum possible horsepower load and provide the full load survey **within 6 months**. If the noise attributable to the operation of all of the equipment at the CS 348 under interim or full horsepower load conditions exceeds existing noise levels at any nearby NSAs, Natural shall file a report on what changes are needed and shall install the additional noise controls to meet the level **within 6 months** 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

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Appendix 1 Cumulative Projects Map

Appendix 1 - Past, Present, and Reasonably Foreseeable Projects Considered in the Cumulative Impacts Analysis for Project							
Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
FERC Jurisdictional Projects							
Cameron LNG Project (Cameron LNG, LLC)	Expansion of the existing LNG facility to include three liquefaction trains (Trains 1-3), an additional storage tank, and a new 21-mile, 42-inch-diameter pipeline.	Cameron Parish, Louisiana	824	37.29 miles northeast	Construction is ongoing. Operation is anticipated to begin in 2019.	Yes	Socioeconomics
Cameron LNG Expansion Project (Cameron LNG, LLC)	Expansion of the existing LNG facility to include two additional liquefaction trains (Trains 4 and 5).	Cameron Parish, Louisiana	141	37.29 miles northeast	Project was authorized by FERC in May 2016; however, construction has not begun. Construction start date is unknown.		N/A
Sabine Pass Expansion Project (Kinder Morgan Louisiana Pipeline, LLC)	Modification of existing interconnects; construction of a new interconnect; installation of6,400 feet of 36-inch-diameter pipeline, 1,200 feet of 36-inch lateral, and 700 feet of 24-inch-diameter pipeline; and installation of additional horsepower at a previously authorized but not yet constructed compressor station.	Cameron and Acadia parishes, Louisiana	28.17	Overlaps with Contractor/Staging Yards and AR-1	Construction is scheduled to begin in April 2018.Project is anticipated to be placed into service by April2019.	Yes	Water Use and Quality; Fish, Wildlife, and Vegetation; Cultural Resources; Geological Resources; Soils; Land Use, Recreation, and Aesthetics; Air; Noise and Vibration; Socioeconomics

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Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
SPLNG Third Berth Expansion Project – Same location as Sabine Pass Expansion Project	The proposed expansion of the LNG terminal consists of the addition of a third marine berth and supporting facilities. The third berth will be used to load LNG vessels for export and is sized to accommodate vessels with a capacity of 125,000 to 180,000 cubic meters.	Cameron Parish	375.1	About 500 feet	Construction is anticipated to start in 2020, if approved.	Yes	Water Use and Quality; Fish, Wildlife, and Vegetation; Cultural Resources; Geological Resources; Soils; Land Use, Recreation, and Aesthetics; Air; Noise and Vibration; Socioeconomics
Commonwealth LNG Project (Commonwealth LNG, LLC)	Construction of a LNG facility consisting of eight LNG trains and one marine loading berth.	Cameron Parish, Louisiana	180	31.85 miles east	Construction is anticipated to begin by 4th quarter of 2019.Operation is anticipated to begin 2nd Quarter of 2022.	Yes	Socioeconomics
Calcasieu Pass LNG Project (Venture GlobalLNG, Inc)	Construction of a new LNG export facility, consisting of two ship loading berths, and two LNG storage tanks, as well as the construction of one 23.5-mile long, 42-inch diameter natural gas interconnecting pipeline.	Cameron Parish, Louisiana	Facility:464.6 Pipeline:370.9	32.38 miles east	Construction is anticipated to begin mid-2018 and would take approximately 36 months to complete. Operation is anticipated to begin 2021.	Yes	Socioeconomics
Liquefaction Expansion Project (Sabine Pass Liquefaction Expansion, LLC)	Expansion of existing facilities by siting, constructing, modifying, and operating two new LNG liquefaction trains (Trains 5 and 6).	Cameron Parish, Louisiana	401.15	Overlaps with Contractor/Staging Yards and AR-1	Construction of Train 5 is ongoing with operation anticipated to begin in December 2019.The construction schedule for Train 6 is unknown.	Yes	Water Use and Quality; Wildlife, and Vegetation; Geological Resources; Soils; Land Use, Recreation, and Aesthetics; Air; Noise and Vibration; Socioeconomics
Golden Pass LNG Expansion Project (Golden	Expansion of existing Golden Pass Import Terminal and	Jefferson County, Texas	Facility:919	1.42 mile west	FERC authorization received in December	Yes	Air- operation, Socioeconomics

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Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
Pass Pipeline LLC and Golden Pass Products, LLC)	expansion of the Golden Pass Pipeline through construction of approximately 2.6 miles of new 24-inch-diameter natural gas pipeline loop and appurtenant facilities in Jefferson and Orange Counties, Texas, and Calcasieu Parish, Louisiana.		Pipeline:99		2016; however, construction has not yet begun. Construction start date is unknown.		
Cameron Access Project (Columbia Gulf Transmission, LLC)	Construction of approximately 34 miles of new 30-inch and 36-inch natural gas transmission pipeline.	Cameron, Calcasieu, Jefferson Davis parishes, Louisiana	560.1	37.44 miles northeast	Construction began October 2016. Operation began March 2018.	Yes	Socioeconomics
Port Arthur Pipeline Louisiana Connector Project(Port Arthur Pipeline, LLC)	Construction of approximately 135 miles of new 42-inch-diameter natural gas pipeline, 1 new compressor station, and interconnect facilities in east Texas and west Louisiana.	Jefferson County Texas; Cameron, Calcasieu, Beauregard, Allen, Evangeline parishes, Louisiana	1,980	3.97 miles northwest	Construction is anticipated to begin 1st Quarter 2021. Operation is anticipated to begin 2nd Quarter 2022.	Yes	Air-operation, Socioeconomics
East-West Project (Florida Gas Transmission Company, LLC)	Construct, install, own, and operate approximately 24.7 miles of new lateral and connection pipeline, four new meter stations, and auxiliary and appurtenant facilities and modify station piping at one compressor station along the Florida Gas Transmission's existing pipeline system.	Acadia and Calcasieu parishes, Louisiana and Matagorda, Wharton, Jefferson, and Orange counties, Texas	316.8	10.28 miles northwest	Project was authorized in April 2018.	Yes	Socioeconomics, Air-operation

Appendix 1 - Past, Present, and Reasonably Foreseeable Projects Considered in the Cumulative Impacts Analysis for Project							
Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
Delfin LNG Project Onshore Compressor Station	The Delfin LNG project will consist of four primary components (see rendering below): An existing, subsea pipeline, an onshore compressor system, and the Delfin LNG Deepwater Port consisting of 4 Floating natural gas liquefaction vessels with a total export capacity of 13 million metric tonnes per year of LNG	Offshore and in Cameron Parish, LA	Unknown	20 miles east (compressor station), 50 miles offshore	Unknown	Yes (onshore compressor station only)	Air-operation
Port Arthur Liquefaction Project, Texas Connector Project, Louisiana Connector Project	Pipeline facilities, 2 compressor station, and LNG Export terminal in Jefferson County, Texas	Jefferson and Orange Counties, Texas and Cameron, Calcasieu, Beauregard, Allen, Evangeline, and St. Landry Parishes, Louisiana.	LNG Export terminal 7,140 acres. Pipeline Facilities 3,471 acres	LNG terminal about 12 miles	Construction start 2019	Yes	Air - operation
Residential Projects							
Lake Arthur Development - Phase I (James W. Ethridge)	Construction of a multi-residential community development including bulkheads installation, canal creation, re-routing of a parish road, reclaiming land, and removing an existing section of a parish road.	Cameron Parish, Louisiana	25.51	70.75 miles northeast	Construction began July2015 and is anticipated to be complete February 2020.	Yes	Socioeconomics

Appendix 1 - Past, Present, and Reasonably Foreseeable Projects Considered in the Cumulative Impacts Analysis for Project							
Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
Lake Arthur Development - Phase II (James W. Ethridge)	Phase II construction of a residential subdivision including inland canal creation, land reclamation, bulkheads installation, and backfill.	Cameron Parish, Louisiana	33.01	70.89 miles northeast	Construction began June2016 and is anticipated to be completed June 2021.	Yes	Socioeconomics
Oak Ridge at Johnson Bayou (Pebble, LLC)	Development of a 69-lot residential subdivision.	Cameron Parish, Louisiana	63.01	10.69 miles east	Construction of subdivision began October 2015 and is ongoing as lots are sold.	Yes	Socioeconomics, Air
Mitigation Projects							
South Grand Chenier Marsh Creation – Baker Tract (ME-32) (U.S. Fish and Wildlife Service)	Creation and nourishment of a total of 1,021 acres of marsh formerly brackish with dredged material from a Gulf of Mexico borrow source.	Cameron Parish, Louisiana	420	60.96 miles east of AR-1	Construction schedule has not been set.	No. Plans to initiate construction are undetermined or are not publicly available. Therefore, cumulative impacts cannot be reasonably evaluated due to unknown project status.	Socioeconomics

Appendix 1 - Past, Present, and Reasonably Foreseeable Projects Considered in the Cumulative Impacts Analysis for Project							
Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
Transportation Projects							
SH 87 Shoreline Protection Project(Texas Department of Transportation – Beaumont District))	Construction of shoreline protection along a 3.1-mile distance of SH 87 which includes the installation of extended culverts, bedding, riprap, and sheet pile.	Jefferson County, Texas	3.0 miles	3.48 miles northwest	Permit pending and is expected to be received Spring 2018. Construction is estimated to take 4 months to a year to complete.	Yes	Fish, Wildlife, and Vegetation; Socioeconomics; Air-operation
I-10 Road Widening Project Phase I (Texas Department of Transportation – Beaumont District)	Widening the freeway from 4 to 6 lanes.	Jefferson County, Texas	2.10 miles	28.91 miles northwest	Construction is anticipated to be completed in January2021.	Yes	Socioeconomics, Air-operation
I-10 Road Widening Project Phase II (Texas Department of Transportation – Beaumont District)	Widening the freeway from 4 to 6 lanes.	Jefferson County, Texas	6.76 miles	28.68 miles northwest	Construction is anticipated to be completed in January2022.	Yes	Socioeconomics, air-operation
SH 73 Road Maintenance(Texas Department of Transportation – Beaumont District)	Mill and overlay existing roadway.	Jefferson County, Texas	6.90 miles	10.53 miles northwest	Construction is anticipated to be completed in March2018.	Yes	Air-operation
Beaumont Terminal (USA Rail Terminals Beaumont Texas)	Construct a railroad spur and siderails that would connect to an existing railroad. The newly constructed facilities would include21 rail siding lines, varying from 2,580 to 3,507 feet in length and1.03-mile emergency vehicle access road, at the project site.	Jefferson County, Texas	57	21.32 miles northwest	Construction proposed for May 2018 and anticipated to be completed by December2018.	Yes	Air-operation

Appendix 1 - Past, Present, and Reasonably Foreseeable Projects Considered in the Cumulative Impacts Analysis for Project							
Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
Berth 5 Expansion Project	The Port of Port Arthur Navigation District has proposed the construction of wharf deck, new bulkhead wall, existing bulkhead wall improvements, anchor wall, bulkhead return wall, low mast light poles and associated foundations, shoreline stabilization, dredging, filling of the Grannis Ditch, site fill, fencing, hydromulching, and other work associated with the extension of the existing dock located at the Port of Port Arthur.	Jefferson County, TX	Unknown	About 10 miles	Bid package issued by Port of Port Arthur in January 2018. Status of project is unknown.	Yes	Air-Operation

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Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
SNWW Channel Improvement Project (CIP)	The CIP is a large-scale transportation infrastructure project sponsored by the federal government and managed by the USACE to deepen the SNWW from 40 feet to 48 feet (SNND). The USACE approved the project in 2011. In 2013, the U.S. Senate and Congress both approved versions of the Water Resource Development Act (S.601) and the Water Resources Reform and Development Act (H.R.3080) that would allow the CIP to move forward. President Obama signed the House version of the Act (H.R.3080) into law in 2014, thereby authorizing the USACE to move forward with development of the CIP.	Jefferson and Orange Counties, TX	Unknown	About 10 miles	Construction start date is unknown. After construction begins, it is expected to take 7 to 10 years to complete the project.	Yes	Air-Operation

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Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
Calcasieu Parish Transportation Plan	According to the Calcasieu Parish Transportation Plan, the Parish plans to conduct the following road improvement projects: I-10 Widening to Six Lanes; LA 27 Widening from Lewis St to Bankens to LA 12; LA 378 Corridor Improvements – John Stine to LA 378 Spur; US 90 Corridor Improvements in Sulphur Area – From I-10 to Post Oak Ave; Houston River Rd Improvements – LA 378 to LA 27 / N Beglis Pkwy; Enterprise Blvd Extension to Fitzenreiter Rd to US 171; Nelson RD Ext from Avenue L'Auberge to Sallier St. - New 4 Lane Road and Bridge (Committed Project); Cities Service Hwy Extension (Sasol Project); and New I-10 Interchange West of Ruth St / LA 1256 Interchange. Municipalities impacted by the road improvement projects include Lake Charles, Westlake, Sulphur, and DeQuincy; the towns of Iowa and Vinton; and unincorporated communities of Moss Bluff and Carlyss.	Calcasieu Parish, LA	Unknown	About 10 miles	Projects are being or will be constructed in three stages between 2015 and 2040.	Yes	Air-operation

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Project	**Project Description**	**County / Parish, State**	**Project Size (acres)[b]**	**Closest Distance from Project[a]**	**Estimated Construction Timeframe**	**Included in Cumulative Impact Analysis**	**Resources Potentially Affected within the proposed Project's Geographic Scope[a]**
N/A – not applicable AR – access road [a] Only resources in which a cumulative impact may occur are identified. [b] Project size was identified based on publicly available documentation including reported acreages or review of mapping exhibit.							