

## **2.0 PROPOSED ACTION**

The Gulf LNG Liquefaction Project consists of two main components: (a) expansion of the existing Terminal in Jackson County, Mississippi (Terminal Expansion) in order to liquefy domestic natural gas into LNG for export to FTA nations and, if approved, non-FTA nations and (b) piping modifications to add bi-directional flow capability (Pipeline Modifications) to the existing pipeline facilities. Figure 1.4-1 depicts the general location of the Project, figure 2.0-1 depicts the locations of the key components of the proposed Terminal Expansion, and figure 2.0-2 depicts the locations of the Pipeline Modifications.

### **2.1 EXISTING FACILITIES**

#### **2.1.1 Gulf LNG Import Terminal**

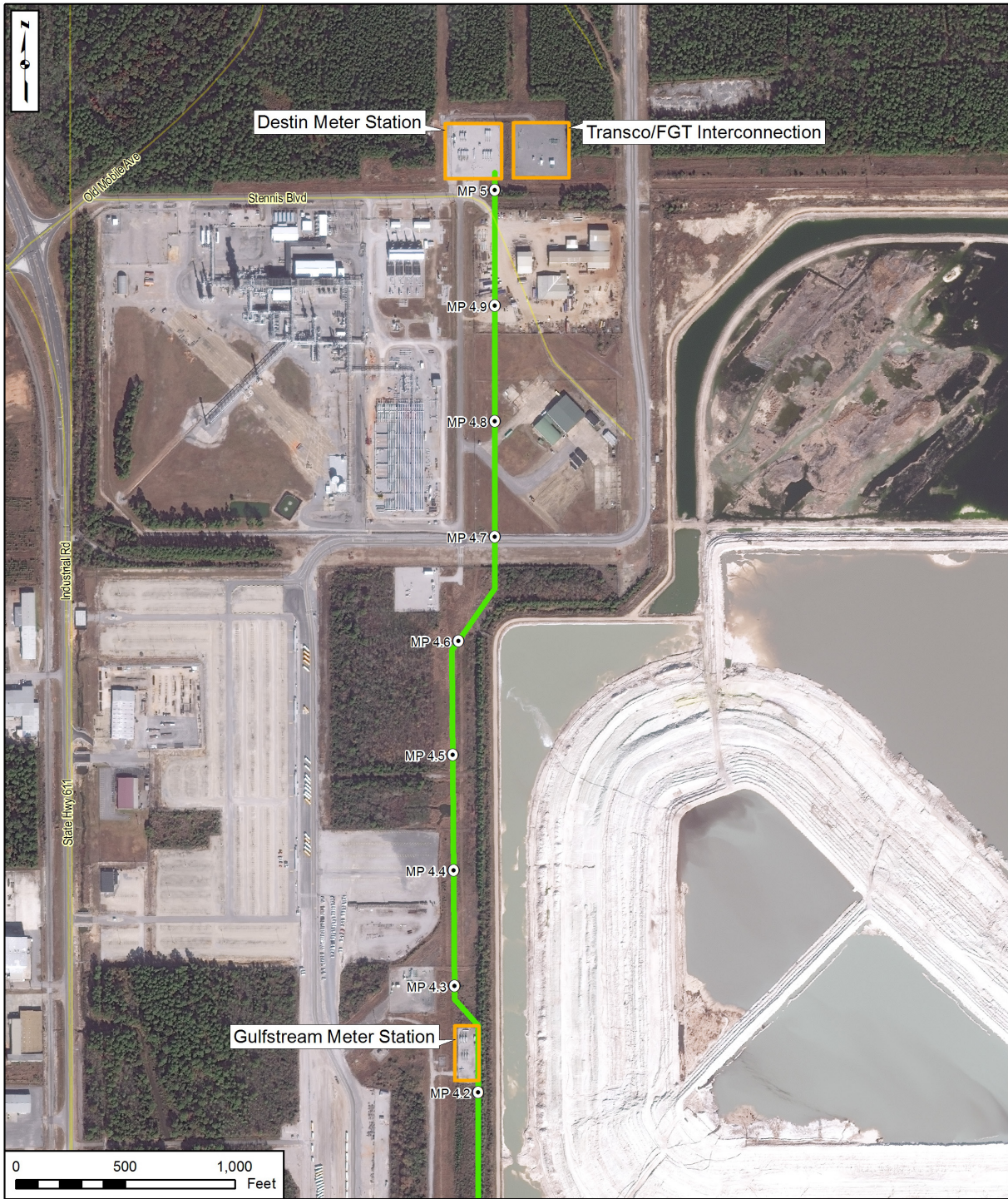
The existing Terminal encompasses 33 acres and is near the City of Pascagoula at the south end of SH-611. Gulf LNG constructed the existing Terminal to regasify and transport natural gas imported to the United States from foreign markets. The environmental review for the existing Terminal was provided in the FERC final EIS issued in November 2006 (FERC, 2006). In 2007, the Terminal was authorized by the Commission to send out 1.5 bcf/d of natural gas through the Terminal facilities for delivery to interconnections with the interstate pipeline systems of Destin and Gulfstream, and the non-affiliated third-party processing plant owned by BP American Production Company (FERC, 2007).

Construction of the Gulf LNG Import Terminal was authorized by the FERC on February 16, 2007, and the facility was placed into service on October 1, 2011. A maximum of 200 LNG carriers per year are currently authorized to import foreign LNG at the marine berth of the existing Terminal. Unloading of LNG can occur at a rate of up to 12,000 m<sup>3</sup> per hour, with unloading typically requiring about 24 hours. The frequency and total number of LNG carriers calling on the existing Terminal each year could vary depending on the size of carriers, with authorized vessel sizes ranging from 88,000 to 170,000 m<sup>3</sup>. The berthing facility was designed and constructed to accommodate LNG carriers up to 250,000 m<sup>3</sup> in size. The average frequency of LNG carriers that could call on the existing Terminal is about one carrier every 2.4 days.

The existing Terminal includes the following major facilities:

- one berthing facility on the Bayou Casotte Navigation Channel;
- two LNG storage tanks, each with a capacity of 160,000 m<sup>3</sup>;
- hazard detection, control, and prevention systems, cryogenic piping and insulation, and electrical and instrumentation systems;
- a firewater system;
- a concrete storm surge protection wall surrounding the Terminal with a top elevation of 27 feet NAVD;
- 23,000 volt electrical services provided by MPC, and a transformer to step down the voltage to 4,160 volts for service to the Terminal;
- two essential power backup gas turbine generators each with a capacity of 12 megawatts; and
- ancillary utilities, buildings, and service facilities.





**Legend**

- ⊙ Milepost
- ▭ Station Boundary
- Existing Gulf LNG Pipeline

**Figure 2.0-2**  
**Gulf LNG Liquefaction Project**  
 Pipeline Modifications

## 2.1.2 Gulf LNG Existing Pipeline System

Gulf LNG owns and operates the 5-mile-long, 36-inch-diameter natural gas send out pipeline and associated facilities that were constructed in conjunction with the existing Terminal (FERC, 2007). The existing Gulf LNG Pipeline extends north from the existing Terminal along SH-611 and connects to the Gulfstream, Destin, and Transco/FGT pipeline systems and the Pascagoula Gas Processing Plant operated by BP American Production Company.

## 2.2 PROPOSED FACILITIES

### 2.2.1 Terminal Expansion

The Terminal Expansion facilities would be constructed adjacent to the existing Terminal boundaries on land currently owned by the COE and the Port of Pascagoula and part of the BCDMMS (see figure 2.0-1).<sup>1</sup> The BCDMMS is used by the COE for placement of dredged materials from maintenance dredging of the Bayou Casotte Navigation Channel. Gulf LNG has not requested a change to the currently authorized number of or the transit route for the LNG carriers; however, Gulf LNG has requested authorization to increase the size of LNG carriers permitted at the facility from 170,000 m<sup>3</sup> to 208,000 m<sup>3</sup>. The USCG determined that the navigation portion of the original WSA did not account for larger LNG carriers. The USCG prepared an updated draft LOR and LOR-A, which was provided to the FERC in January 2016. The USCG prepared the final LOR and LOR-A dated May 16, 2016 which was provided to the FERC on August 9, 2017. The USCG concluded that the Bayou Casotte Channel was suitable for LNG marine traffic. See additional discussion in section 1.2.

#### 2.2.1.1 Liquefaction Facilities

##### Liquefaction Trains, Utilities, and Systems

The existing Gulf LNG Pipeline and the Pipeline Modifications (see section 2.2.2) would transport natural gas (feed gas) to the liquefaction facilities at the existing Terminal. The liquefaction facilities would consist of two liquefaction trains, gas pretreatment units, utilities, and associated facilities (see figure 2.0-1). Prior to entering a liquefaction train, the feed gas would pass through a pretreatment unit to remove mercury, H<sub>2</sub>S, CO<sub>2</sub>, water, and heavy hydrocarbons. The heavy hydrocarbon removal unit would remove heavier hydrocarbons present in the feed gas (i.e. pentane, hexane, and benzene) which would be temporarily stored on-site, then trucked from the Project site to third-party customers (see sections 1.4.2 and 2.2.1.3).

After the feed gas is treated to remove the contaminants and heavy hydrocarbon components, the liquefaction unit would precool the feed gas using a closed loop propane system followed by condensing and subcooling the feed gas with a mixed refrigerant loop. The resultant liquid stream would enter an energy extraction LNG hydraulic turbine which would further lower the temperature of the LNG. Gulf LNG would then transport the LNG in cryogenic pipelines to the existing LNG storage tanks where it would be stored at -256 degrees Fahrenheit (°F) at atmospheric pressure.

Liquefaction utility components would include a boil-off gas (BOG) system, fuel gas system, hot oil system, flares, instrument and utility air systems, nitrogen generation system, source water system, tempered water system, firewater system, refrigerant storage system, NGL storage, and hydrogen sulfide storage. BOG would be generated from the transfer of heat in the liquefaction process and diverted to three new BOG compressors and two new BOG recycle compressors. Much of the compressed BOG

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<sup>1</sup> Section 4.8.2.1 provides a discussion regarding lease agreements with the COE and the Port of Pascagoula.

would be transported by pipeline to the fuel gas system, with excess BOG recycled through the liquefaction process.

Gulf LNG would install three in-service flares and a common spare flare on the southwestern portion of the Terminal Expansion site for venting excess natural gas, if necessary, during maintenance, startup/shutdown, and upset activities. The four flares would be constructed on a common 430-foot-tall support structure (see figure 2.0-1), with an overall height of 433 feet above msl.

#### **2.2.1.2 LNG Storage**

Gulf LNG would use the two existing 160,000 m<sup>3</sup> full-containment LNG storage tanks constructed of nickel steel and concrete (FERC, 2006). The only storage tank changes required for the Project would be the new LNG loading pumps installed in the existing storage tanks to transfer LNG-to-LNG carriers through the existing transfer lines.

#### **2.2.1.3 Refrigerant and NGL Storage and NGL Trucking**

Gulf LNG would construct and operate a truck loading/unloading facility to unload makeup refrigerant (propane and ethane) transported to the Terminal Expansion site for storage and use during the liquefaction process. Gulf LNG would store ethane in three pressurized storage tanks, each with a working capacity of 8,954 cubic feet (ft<sup>3</sup>) and would store liquid propane in a tank with a capacity of 114,485 ft<sup>3</sup>. Each refrigerant storage tank would be installed within a secondary containment system located, sized, and designed in accordance with American Petroleum Institute (API) Standard 2510 (Design and Construction of LPG Installations) and NFPA Code 30 (Flammable and Combustible Liquids). Gulf LNG anticipates a delivery frequency of three to four trucks per month to the facility for propane and one to two trucks per month for ethane.

The heavy hydrocarbon removal unit within each of the liquefaction trains would continuously produce NGLs during the liquefaction process. Gulf LNG would construct a 2,800-ft<sup>3</sup> capacity, low-pressure storage tank and a truck loading facility for NGLs. The NGLs would be stored in the tanks prior to pick-up and delivery to third-party customers by truck (see section 1.4.2). Gulf LNG anticipates five truck trips per month would be required to transport NGLs from the expanded Terminal. Gulf LNG estimates ethane would be trucked into the facility up to two times each month and propane would be trucked into the facility up to four times each month. As noted in section 1.4.2, NGL trucking would be a non-jurisdictional activity once the trucks leave the Terminal Expansion site. After leaving the Terminal Expansion site, NGL trucking is regulated by DOT's Federal Motor Carrier Safety Administration.

#### **2.2.1.4 Power Generation**

To provide electrical power to the Terminal Expansion, MPC would build two 1.5-mile-long, 115-kV electric transmission lines from adjacent to the existing Chevron Cogeneration Facility to the Terminal Expansion. MPC would also construct a new 115-kV substation within the Terminal Expansion area. The electric transmission line would be considered non-jurisdictional, as discussed in section 1.4.1, which includes additional details on the electric transmission line.

Four 2.5-MW, diesel-fueled, stand-by generators would be installed in the utility area to provide a source of backup power generation for critical equipment and plant shutdown if the electrical power system were to fail. Diesel for the generators would be stored on-site in a new, 106,971-gallon (14,300 ft<sup>3</sup>) diesel storage tank with secondary containment. The tank would store enough fuel for three generators for 7 days of backup power generation. The fourth generator would be on-site as a spare.

### 2.2.1.5 Supply Docks

Gulf LNG would construct two supply docks as part of the Project, a North Supply Dock and a South Supply Dock. The North Supply Dock would be a permanent facility on the northwestern part of the existing Terminal property at the mouth of Bayou Casotte in Mississippi Sound (see figure 2.2-1). The facility would extend 280 feet along the shoreline, with a 110-foot-wide docking area extending 310 feet into Bayou Casotte. Barges would moor on both sides of the 110-foot-wide extension, perpendicular to the ship channel. Gulf LNG would construct a heavy haul road from the North Supply Dock to the main gate of the existing Terminal.

During construction, Gulf LNG would use the North Supply Dock for barge delivery of large equipment, piles, construction materials, and other construction loads. As discussed in section 1.4.3, following construction, ownership of the North Supply Dock would be transferred to the JCPA. In addition to use of the North Supply Dock by barges and support vessels associated with operation of the Project, the dock may also be used by the JCPA as a berthing facility for barges waiting for a berth at one of the private or public terminals in the Bayou Casotte Harbor or for temporary berthing of other vessels not associated with the Project. Security of the North Supply Dock during operations of the Project would be addressed in Gulf LNG's *Facility Security Assessment and Facility Security Plan* (pursuant to 33 CFR 105) which would be reviewed and approved by the USCG.

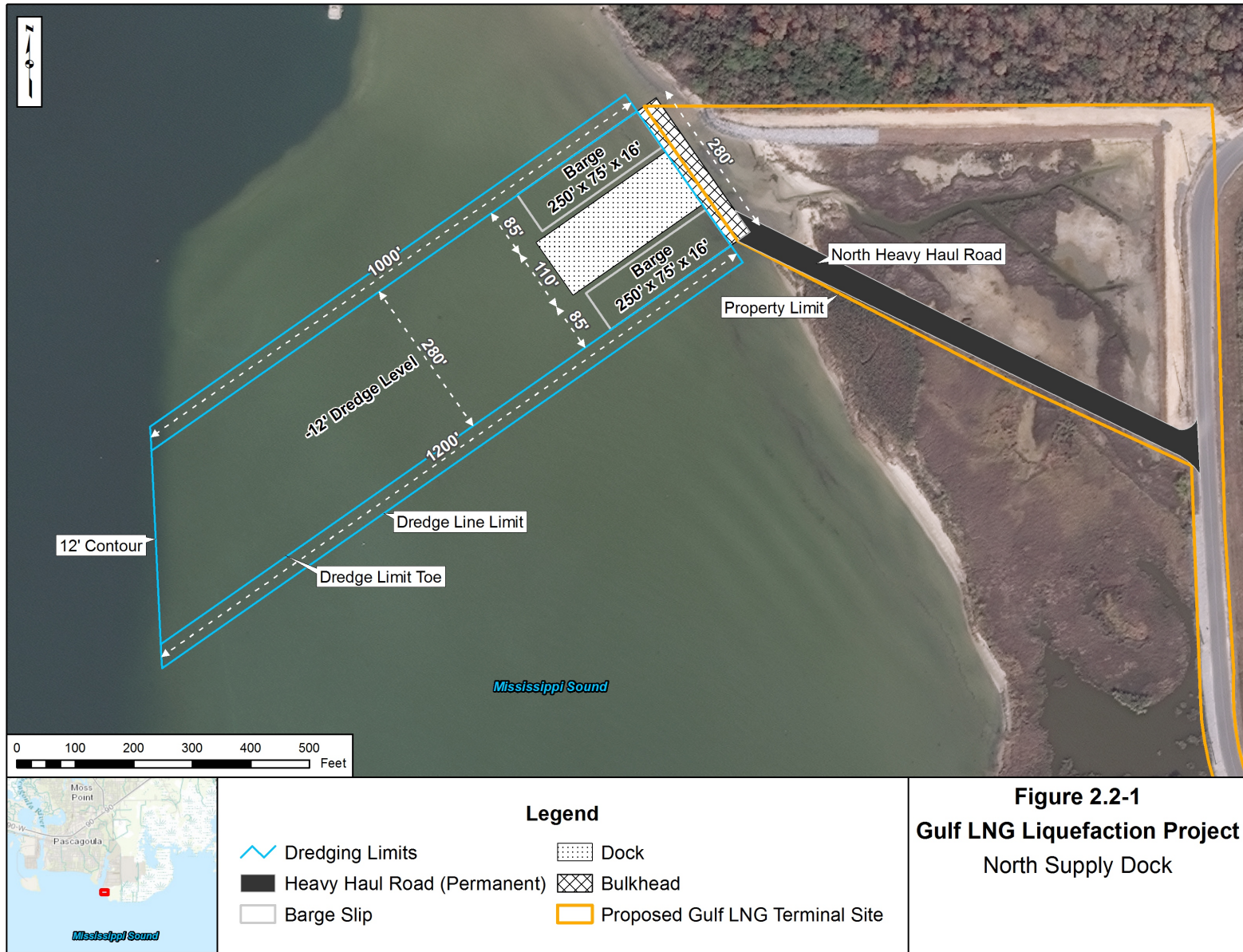
The South Supply Dock would be a temporary facility just south of the existing berthing facility (see figure 2.2-2). It would extend about 200 feet along the shoreline and up to 100 feet from the shoreline and would accommodate one barge at a time. Gulf LNG would construct a heavy haul road from the South Supply Dock to a new gate installed in the storm surge protection wall (see figure 2.2-2). During construction, Gulf LNG would use the South Supply Dock for delivery of fill materials, aggregate, and the flare tower. Upon completion of construction of the Terminal Expansion, Gulf LNG would completely remove the South Supply Dock and restore the adjacent shoreline to pre-construction conditions. A portion of the South Heavy Haul Road (390 feet) would be retained by Gulf LNG during operations for access to the flare tower.

For both supply docks, dredging would be required between the shoreline and the existing channel to safely accommodate barge traffic. Hydrographic surveys conducted by Gulf LNG determined that the current depth of the sea bed at both planned supply docks is relatively flat with water depths ranging from 1 to 4 feet below msl. Gulf LNG would dredge the supply docks to a depth of 12 feet below msl. Gulf LNG estimates, based on similar sediment deposition rates for the existing LNG carrier berth, that about 10,000 cy of sediment would accumulate in each basin annually. Gulf LNG would conduct maintenance dredging of the supply docks on an as-needed basis, which is anticipated to be about every 3 years. Dredging and the disposal of dredged materials are addressed in section 2.6.1.4. Upon completion of construction, Gulf LNG would discontinue maintenance dredging at the South Supply Dock and allow the area to return to its natural bathymetric state. The Port of Pascagoula, which conducts maintenance dredging at the existing marine berth, would assume responsibility for maintenance dredging of the North Supply Dock.<sup>2</sup>

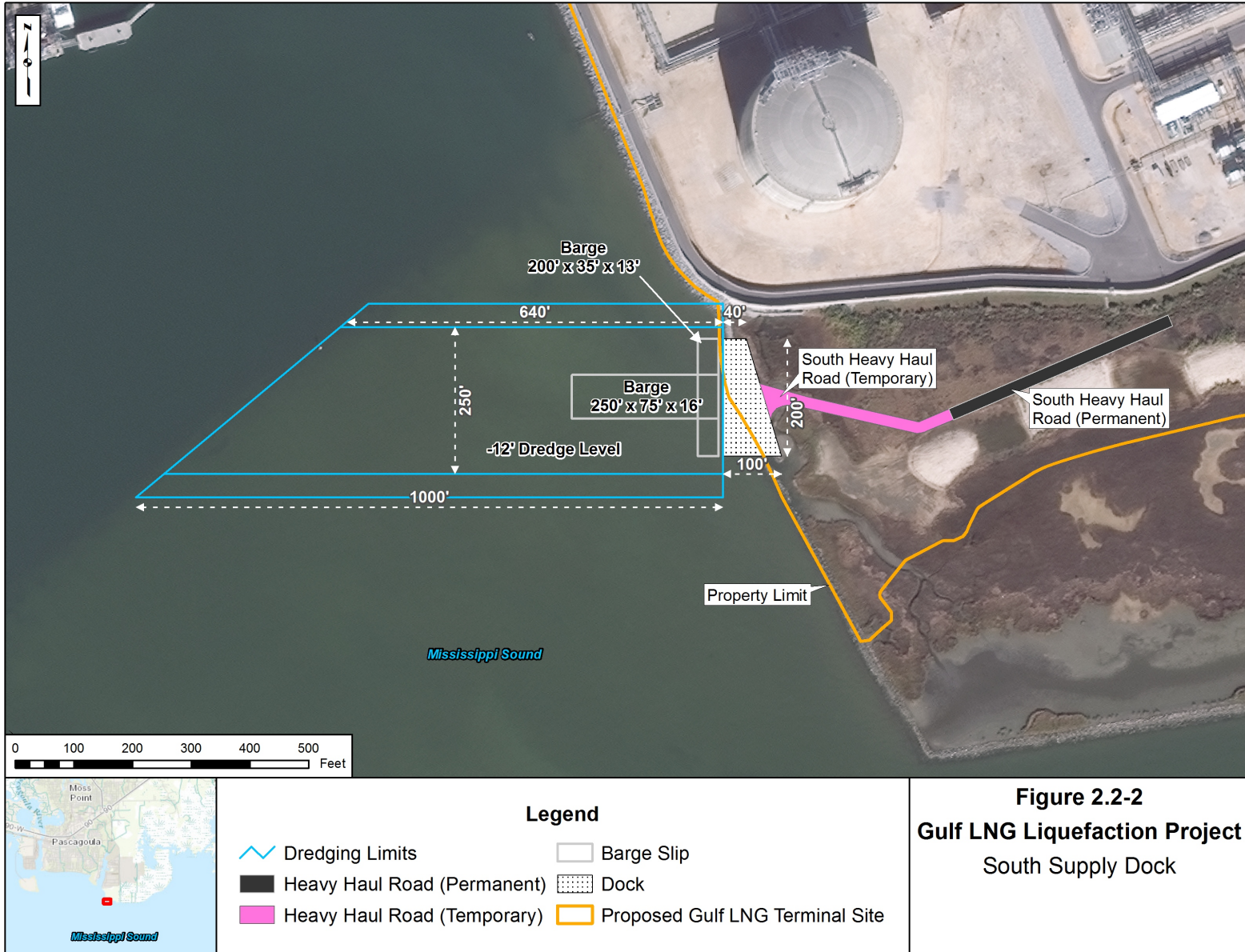
All of the 3.5 acres created at the South Marsh mitigation area as mitigation due to construction of the existing Terminal, would be impacted by the construction of the liquefaction facility, South Supply Dock, and the flare tower.

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<sup>2</sup> See Attachment No. 8 of accession number 20170929-5228.



**Figure 2.2-1**  
**Gulf LNG Liquefaction Project**  
**North Supply Dock**





There are several transit routes that the barges could use before entering the Bayou Casotte Navigation Channel, dependent on the origin of the trip. Barge transit routes are described further in section 4.9.6.

During construction, a temporary barge access channel would be dredged from the South Supply Dock along the outer perimeter of the proposed wetland mitigation site (discussed more in section 4.4) (dredging of about 200,000 cy of material). Barges would use the temporary channel to install the perimeter riprap. The sediment removed for the channel would be temporarily placed within the proposed wetland mitigation site and then replaced in the temporary channel after the riprap is installed. All of the dredge material would be replaced in the temporary channel or contained within the marsh creation area, so off-site disposal would not be necessary.

#### **2.2.1.6 Modifications to Existing Terminal Facilities**

Several minor modifications to facilities at the existing Terminal are proposed as part of the Terminal Expansion. These modifications consist of the following:

- installation of three BOG compressors within the existing Terminal;
- installation of a new 115-kV substation;
- installation of an inlet gas filter;
- installation of ammonia and solvent storage tanks;
- installation of new loading pumps in the existing LNG storage tanks; and
- minor changes to the piping connected to the marine loading arms to permit bi-directional flow.

In addition, Gulf LNG would make minor modifications to the existing water intake structure. The Terminal Expansion would use the same water source as the existing Terminal, the Port of Pascagoula's Industrial Water Supply, for construction and operation of the expanded facility, including firewater. The Port of Pascagoula's Industrial Water Supply is obtained from the freshwater portion of the Pascagoula River about 14 miles north of the City of Pascagoula.

#### **2.2.1.7 Associated Infrastructure**

Infrastructure associated with the Terminal Expansion would include establishment of access roads within the Terminal Expansion site, partial removal of an existing access road, expansion of the existing shoreline protection wall, extension of the COE's existing berm, construction of a new utility/firewater tank, and spill containment, as described further below.

##### **Access Roads**

Gulf LNG would use existing public roads to access the Terminal Expansion site. In addition, the Project would include removal of a segment of an existing road and construction of new access roads within the Terminal Expansion site boundaries (see figure 2.0-1). Gulf LNG would continue to use the existing access road off SH-611 to access the existing Terminal. A portion of this existing access road along the northeastern corner of the storm protection wall would be demolished. New access roads would be constructed throughout the Terminal Expansion site. New access roads would be graveled or paved with asphalt. A temporary heavy haul access road within the Terminal Expansion site would follow the existing access road located along the earthen berm dike around the perimeter of the BCDMMS.

Gulf LNG would also construct two heavy haul roads to connect the North and South Supply Docks with the existing Terminal and the Terminal Expansion (see figures 2.0-1, 2.2-1, and 2.2-2).

### **Storm Protection System**

Gulf LNG would extend the existing storm protection system surrounding the existing Terminal to encompass the Terminal Expansion facilities. The new storm surge protection system would consist of a new concrete wall with a top elevation of 27 feet NAVD and a new earthen berm (an extension of the existing COE berm) with a top elevation of 27 feet NAVD. The berm would be constructed to provide both storm surge protection for the Terminal as well as providing the new dredge spoils perimeter for that corresponding portion of the BCDMMS. Following initial construction of the berm by Gulf LNG, the COE, in order to expand capacity of the BCDMMS, would extend the berm to a height of 39.2 feet NAVD. The COE would be responsible for maintaining the berm during operation of the Project.

The new storm protection concrete wall would connect to the existing wall near the southeast corner of the existing facilities and extend along the southern perimeter of the Terminal Expansion site until tying into the new earthen berm that would extend along the east and northeast sides of the Terminal Expansion site (see figure 2.0-1). The concrete wall would slope into the earthen berm and the berm designed to withstand wave force due to storm surge and would be protected from wave-induced scour with protective armor stone and from seepage by providing sheet pile cut-off along its length. In addition, the berm would be designed to withstand anticipated future COE dredge spoil site loads. The portion of the existing storm protection system between the existing Terminal and the new storm protection concrete wall and new berm would be removed. Gulf LNG has not determined a final plan to extend the storm protection system. Once a final plan has been determined, Gulf LNG would submit the final plan for FERC staff to review.

There are two gates in the existing storm protection wall: one at the main entrance and one near the berthing facility. The existing steel-roller flood gates, about 30 feet wide at the main gate and 17 feet wide at the berthing facility, would remain in place and continue to be used during construction and operation of the expanded Terminal. The gates seal at the base and on both sides when closed for storm events. As part of the Project, a third flood gate would be installed to allow transport of construction materials and equipment from the South Supply Dock to the new facilities via the South Heavy Haul Road. Gulf LNG would install this flood gate in the new storm protection concrete wall in the southwest portion of the Terminal Expansion, and east of the South Supply Dock (see figure 2.0-1). It would also be a steel-roller gate that would seal along the sill and on both sides when closed for storm events.

### **Firewater Facilities**

As noted above, the Terminal Expansion would use the same water source for firewater as the existing Terminal. The firewater delivery system would be expanded to meet the firefighting needs of the expanded Terminal. The expanded firewater system would be designed in accordance with the requirements of the NFPA 59A.

### **Spill Containment System**

Gulf LNG would construct separate containment systems for refrigerant and LNG to contain the materials in the event of an accidental release. See sections 2.7 and 4.12 for additional details.

#### **2.2.1.8 Administration and Maintenance Buildings**

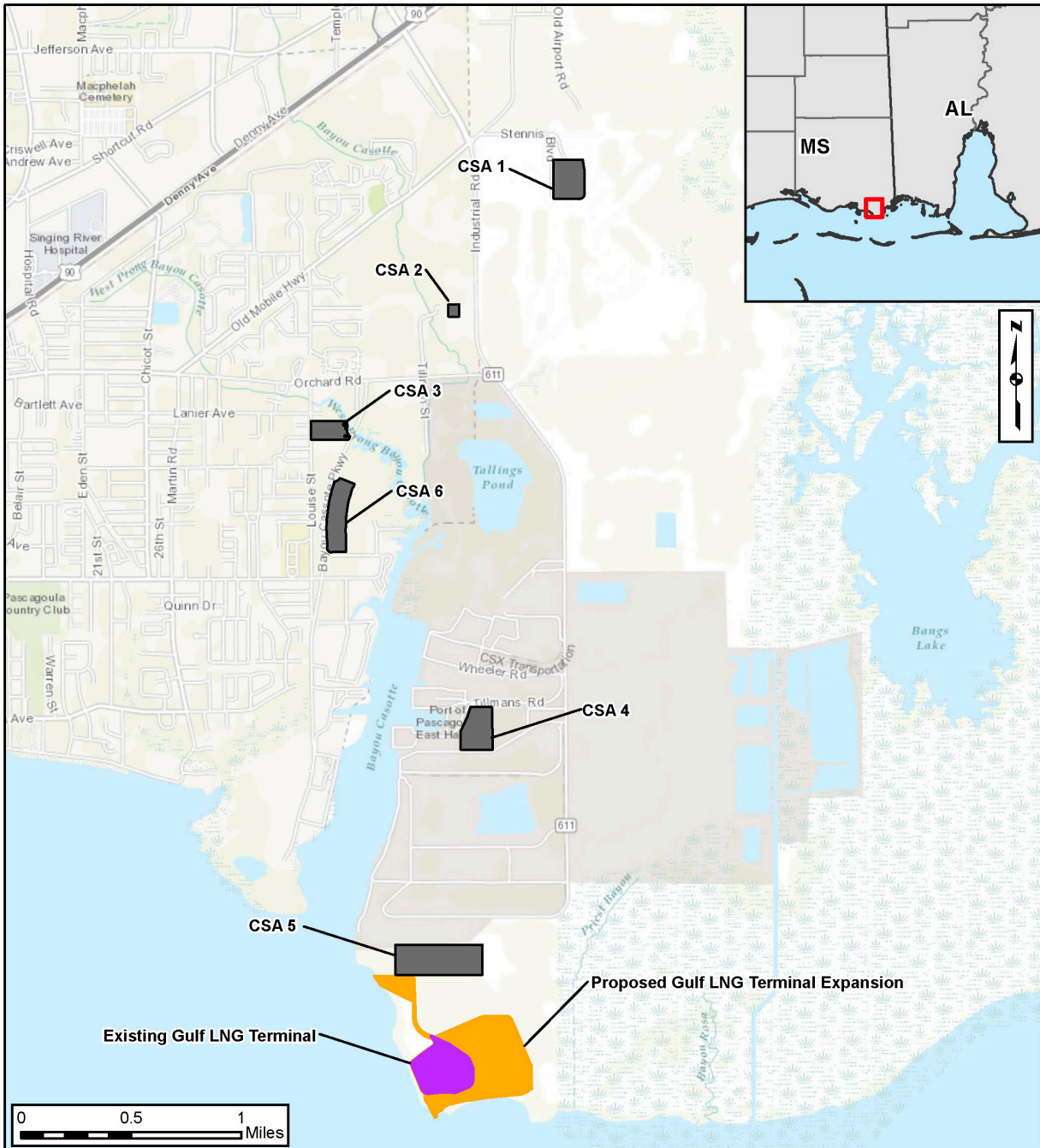
Gulf LNG would relocate the existing Terminal's administrative building to a site east of and near the North Supply Dock. The administrative building and parking lot would impact about 1.3 acres of

the North Marsh Mitigation Area created as mitigation due to construction of the existing Terminal. The existing Terminal's warehouse/maintenance building would be relocated within the Terminal Expansion site. The proposed locations of the administrative building and the warehouse/maintenance building are depicted on figure 2.0-1.

### **2.2.1.9 Construction Staging Areas and Construction Support Areas**

Gulf LNG would use 11.7 acres of land within the Terminal Expansion area for on-site construction staging areas (see figure 2.0-1). Gulf LNG would impact about 4.2 acres of the North Marsh Mitigation Area for a construction staging area. In addition, Gulf LNG would use six off-site CSAs for staging, laydown, contractor yards, fabrication, and parking (see figure 2.2-3). Details regarding each construction staging area are provided below.

- CSA-1 (Knight Yard #1): A 16-acre property about 5 miles north of the existing Terminal on Colmer Drive. The property currently includes existing parking, warehousing, office space, and undeveloped areas. Following construction of the Project, Gulf LNG would restore CSA-1 to landowner specifications.
- CSA-2 (Knight Yard #2): A 1.8-acre property behind an existing warehouse on SH-611 about 4 miles north of the existing Terminal. The current owner has filled the property with rock. Gulf LNG would use CSA-2 for storage and parking during construction of the Terminal Expansion. Following construction of the Project, Gulf LNG would restore CSA-2 to landowner specifications.
- CSA-3 (Louise Street): An 8.8-acre property about 2.8 miles northwest of the existing Terminal on Louise Street. CSA-3 (Louise Street), which is owned by Gulf LNG, is currently used for warehousing and equipment storage. Gulf LNG would continue the present use of this site during and after Project construction.
- CSA-4 (Port Property): A 16.2-acre property about 2.5 miles north of the existing Terminal within the Port of Pascagoula's property off SH-611. The property is an existing industrial site and was previously used as a construction support area for the existing Terminal. Following construction of the Project, Gulf LNG would restore CSA-4 to landowner specifications.
- CSA-5 (Chevron Property): A 34.5-acre property adjacent to the existing Terminal to the north. Portions of the property are existing industrial and portions are wetlands. Following construction of the Project, CSA-5 would be restored according to landowner specifications.
- CSA-6 (Bosarge Property): An 18.1-acre property on Bayou Casotte Parkway about 2.5 miles north-northwest of the existing Terminal. The property is an existing industrial site currently developed as a parking lot. Gulf LNG would use CSA-6 for additional parking during construction. Following construction of the Project, CSA-6 would be restored according to landowner specifications.



- Construction Support Areas (CSAs)
- Existing Gulf LNG Terminal Site
- Proposed Gulf LNG Terminal Expansion

**Figure 2.2-3**  
**Gulf LNG Liquefaction Project**

Construction Support Areas

## **2.2.2 Pipeline Modifications**

Gulf LNG would modify two existing pipeline metering stations and the existing Gulf LNG Pipeline at the existing Terminal to enable bi-directional (north/south) flow capability.

At the Destin and Gulfstream interconnections, Gulf LNG would install two pipeline segments at each interconnect and the necessary switching valves to allow the existing metering stations to meter natural gas flow to the Terminal Expansion while retaining the ability to meter natural gas flow from the existing Terminal to the distribution pipelines. Gulf LNG would install a 30-inch-diameter 200-foot-long pipeline segment and a 30-inch-diameter 40-foot-long pipeline segment at the Gulfstream Meter Station. Additionally, Gulf LNG would install a 36-inch-diameter 240-foot-long pipeline segment and a 36-inch-diameter 210-foot-long pipeline segment at the Destin Meter Station. All existing instrumentation at the meter stations would remain unchanged. In addition, Gulf LNG would install filters at both interconnections to remove trace quantities of solids, which could affect the liquefaction equipment. Gulf LNG would construct the modifications within the existing fenced and graveled areas, with the exception of 0.1 acre of temporary workspace outside the fence line of the existing Gulfstream Meter Station but within the existing pipeline right-of-way. No other equipment within the existing facilities would be affected.

Transco would also make modifications to the existing and jointly owned Transco/FGT Interconnection to permit bi-directional flow. These modifications would be constructed by Transco and would be reviewed by the FERC under its blanket certificate process. According to Gulf LNG, modifications at the Transco/FGT Interconnection would be completed between October 2023 and March 2024.

The Gulf LNG Pipeline connection to the existing Terminal, which is within the existing Terminal boundaries, would also be modified to allow bi-directional flow and to provide a connection to the inlet of the pretreatment facilities of the liquefaction process. The flow capacity of the existing Gulf LNG Pipeline would not change.

The Destin and Gulfstream Meter Stations and the Transco/FGT Interconnection already have existing permanent access roads to each facility.

## **2.3 LAND REQUIREMENTS**

Gulf LNG would disturb 230.8 acres of land and open water for construction of the Project (both the Terminal Expansion and the Pipeline Modifications) and 172.1 acres for its operation. Operation of the Terminal Expansion (excluding access roads) would permanently impact 100.5 acres of land. Construction of the Pipeline Modifications would impact 3.6 acres of land, which would be restored following construction. Land requirements for the Project are summarized in table 2.3-1.

### **2.3.1 Terminal Expansion**

Construction of the Terminal Expansion facilities would require a combined area of 132.8 acres on land and on open water. Operation would affect 129.7 acres, including the Terminal Expansion site, the North Supply Dock, the North Supply Heavy Haul Road, and access roads. Of that area, 10.6 acres are within the boundaries of the existing Terminal. Gulf LNG would maintain all onshore areas with concrete or gravel cover and permanently convert them to industrial use.

TABLE 2.3-1

**Land Requirements for the Proposed Gulf LNG Liquefaction Project a/**

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres) <u>b/</u>
<b>Terminal Expansion</b>		
Existing Terminal Facilities <u>c/</u>	22.7	22.7
Construction Staging Areas	11.7	11.7
Maintenance Building	2.0	2.0
Main Substation	2.9	2.9
LNG Train 1	11.8	11.8
LNG Train 2	11.7	11.7
Plant Open Storage	10.0	10.0
Utility Area	8.9	8.9
Refrigerant Storage Area	6.3	6.3
Truck Unloading Area	1.0	1.0
Flare Tower	0.1	0.1
Flare Exclusion Zone	0.0	3.1 <u>d/</u>
Extension of the COE's Berm	6.8	6.8
Admin Building & Parking	1.3	1.3
<b>Total Terminal Expansion</b>	<b>97.2</b>	<b>100.3</b>
<b>Supply Docks</b>		
North Supply Dock	9.1	9.1
North Heavy Haul Road	0.8	0.8
South Supply Dock	6.4	0.2
South Heavy Haul Road	0.4	0.4
<b>Total Supply Docks</b>	<b>16.7</b>	<b>10.5</b>
<b>Access Roads <u>e/</u></b>		
Existing Access Roads	9.8	9.8
New Access Roads	9.2	9.2
Access Roads Converted to Terminal Open Space	0.1	0.0
<b>Total Access Roads</b>	<b>19.0</b>	<b>19.0</b>
<b>Off-site CSAs</b>		
CSA-1 (Knight Yard #1)	16.0	0.0
CSA-2 (Knight Yard #2)	1.8	0.0
CSA-3 (Louise Street) <u>f/</u>	7.8	7.8
CSA-4 (Port of Pascagoula Property)	16.2	0.0
CSA-5 (Chevron Property)	34.5	34.5 <u>g/</u>
CSA-6 (Bosarge Property)	18.1	0.0
<b>Total CSAs</b>	<b>94.4</b>	<b>42.4</b>

TABLE 2.3-1

**Land Requirements for the Proposed Gulf LNG Liquefaction Project a/**

<b>Facility</b>	<b>Land Affected During Construction (acres)</b>	<b>Land Affected During Operation (acres) <u>b/</u></b>
<b>Pipeline Modifications</b>		
Destin Meter Station Modifications	1.5	0.0
Gulfstream Meter Station Modifications	0.6	0.0
Transco/FGT Interconnection Modifications	1.5	0.0
<b>Total Pipeline Modifications</b>	<b>3.6</b>	<b>0.0</b>
<b>Total Gulf LNG Liquefaction Project</b>	<b>230.8</b>	<b>172.1</b>
a	The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.	
b	The portion of construction impacts that Gulf LNG would permanently maintain.	
c	The existing Terminal is 33.3 acres. Portions (10.6 acres) of the Terminal Expansion would overlap with the existing Terminal. The remaining 22.7 acres were used to calculate impacts.	
d	The acres associated with the flare exclusion zone are related to impacts on wetland vegetation located outside the Project footprint. Radiant heat from periodic flare events may impact the wetland vegetation surrounding the flare tower. These events would be associated with maintenance, startup/shutdown, and upset conditions at the Terminal Expansion.	
e	All access roads would be located within the boundaries of the Terminal Expansion.	
f	0.4 acre of forested wetland and 0.6 acre of upland forest at CSA-3 would be avoided and are not included in the total.	
g	34.5 acres of existing vegetation at CSA-5 would be removed during construction. Mitigation is discussed in section 4.4.	

**2.3.1.1 Access Roads**

Gulf LNG would construct new access roads within the Terminal Expansion area to connect the existing Terminal with the Terminal Expansion. These access roads would impact 9.2 acres (see figure 2.0-1). A 0.1-acre portion of an existing access road within the Terminal would be converted from an access road to open space within the existing Terminal.

**2.3.1.2 Construction Support Areas**

Additionally, Gulf LNG would use six off-site CSAs during construction of the Terminal Expansion. Use of these sites would temporarily impact 94.4 acres of land during construction. Of this total, 42.4 acres would be permanently converted to industrial use and 52 acres would revert to pre-construction industrial use and would no longer be utilized by Gulf LNG. Most of the CSAs are currently existing industrial sites.

**2.3.2 Pipeline Modifications**

Gulf LNG would affect 3.6 acres during construction of the Pipeline Modifications, all of which would be restored following construction.

## 2.4 CONSTRUCTION SCHEDULE AND WORKFORCE

Gulf LNG anticipates conducting construction and initiating service in two phases, with construction starting in the second quarter of 2020 (assuming receipt of all required certifications, authorizations, and permits). Gulf LNG anticipates completing construction of the first liquefaction train and associated facilities by the second quarter of 2024 and initiating service in the third quarter of 2024. From the start of construction until initiation of service for the first train would take a period of about 52 months. Construction of the second liquefaction train would begin in the fourth quarter of 2021 and Gulf LNG anticipates completing construction and initiating service in the second quarter of 2025. Overall construction would require about 66 months from initiation of site preparation to startup of the second train. To help distribute impacts of vehicle trips by workers, Gulf LNG would have two daytime shift start times and 40 percent of the workforce would work on the night shift (24-hour construction). The construction manpower is expected to peak at about 4,300 individuals between months 31 and 46 of the 66-month Project schedule. Construction workers would be bused from parking areas at CSA-6 to the Terminal work locations. An updated *Traffic Impact Analysis* has been prepared and is discussed further in section 4.9.

Modifications to the Destin and Gulfstream Meter Stations would begin in October 2023. According to Gulf LNG, modifications at the Transco/FGT Interconnection would be completed between October 2023 and March 2024 and are anticipated to be conducted under its blanket authorization with the FERC.

## 2.5 ENVIRONMENTAL COMPLIANCE AND TRAINING

The FERC may impose conditions on any authorization that it grants for the Project. These conditions include additional requirements and mitigation measures recommended in this EIS to minimize the environmental impact that would result from construction and operation of the Gulf LNG Liquefaction Project (see sections 4.1 through 4.12 and section 5.2). We will recommend that these additional requirements and mitigation measures (presented in bold type in the text of the EIS) be included as specific conditions to any authorization issued for the Project. We will also recommend to the Commission that Gulf LNG be required to implement the mitigation measures proposed as part of the Project unless specifically modified by other authorization conditions. Gulf LNG would be required to incorporate all environmental conditions and requirements of the FERC authorization, and associated construction permits into the construction documents for the Project.

Gulf LNG would employ at least one environmental inspector (EI) for the Project. The EIs would be responsible for ensuring the environmental obligations, conditions, and other requirements of permits and authorizations for the Project are met. Gulf LNG's EIs would inspect all construction and mitigation activities to ensure environmental compliance. The EIs may also oversee cultural resource and/or biological monitors that monitor and evaluate construction impacts on resources as specified in this EIS.

Gulf LNG would require that its contractors be familiar with the requirements of all environmental permits and comply with required federal, state, and local environmental regulations and ordinances that apply to construction of the facilities, including restoration of areas temporarily disturbed during construction. In addition to monitoring compliance, the EIs would assist with environmental training for Project personnel regarding environmental conditions and Project-specific plans. The environmental training program would ensure the following:

- qualified environmental training personnel provide training sessions regarding the environmental requirements applicable to the trainees' activities;



- all individuals receive environmental training before beginning work;
- adequate records regarding the training program are kept; and
- refresher training is provided as needed to maintain a high awareness of environmental requirements.

In addition to the EIs, we would also conduct field inspections during construction. Following the inspections, we would enter inspection reports into the Commission's public record. Other federal and state agencies may also conduct inspections of construction and operation to the extent determined necessary by the individual agency. After construction is completed, we would continue to conduct inspections during operation of the Project to ensure successful restoration. Additionally, the FERC staff would conduct biennial engineering safety inspections of the LNG facility operations.

The work areas identified in the EIS should be sufficient for construction and operation (including maintenance) of the Project. However, minor workspace refinements sometimes continue after the planning phase and during construction. These changes could involve minor shifting or adding of new extra workspaces or staging areas, adding additional access roads, or modifying construction methods. We have developed a procedure for assessing impacts on those areas that have not been evaluated in the EIS and for approving or denying their use following any authorization issuance. In general, biological and cultural resource surveys were conducted using a survey corridor larger than that necessary to construct the facilities. If Gulf LNG requests to shift or add workspace subsequent to issuance of an authorization, these areas would typically be within the previously surveyed area. We would typically review such requests using a variance request process. A variance request for additional workspace along with a copy of the survey results would be documented and forwarded to FERC in the form of a "variance request" in complying with recommended condition number 5 in section 5.2 of this EIS. Variance requests typically include any additional surveys, landowner consultation, analysis, and/or resource agency consultations, and supporting documentation.

The procedures used for assessing impacts on work areas outside the survey corridor and for approving their use are similar to those described above, except that additional surveys, analysis and resource agency consultations would be performed to assess the extent of any impacts on biological, cultural, and other sensitive resources and identify any avoidance or minimization measures that may be necessary. All variance requests for the Project and their approval status would be available on the FERC's e-Library webpage under the docket number for the Project.

## 2.6 CONSTRUCTION PROCEDURES

Gulf LNG proposes the following construction methods, which include measures intended to avoid or minimize environmental impacts during construction.

The FERC *Upland Erosion Control, Revegetation, and Maintenance Plan (FERC Plan)* and *Wetland and Waterbody Construction and Mitigation Procedures (FERC Procedures)*<sup>3</sup> are a set of construction and mitigation measures developed to minimize the potential environmental impacts of the construction of pipeline projects in general. Gulf LNG would implement the measures and procedures identified in the *Plan* and *Procedures* with Project-specific proposed modifications. Gulf LNG has not requested any substantive modifications to the *FERC Plan* other than what is necessary to differentiate

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<sup>3</sup> 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>.

the Project from pipeline construction requirements. These modified *Plan* and *Procedures* are referred to as the *Gulf LNG Plan* (see appendix D) and *Gulf LNG Procedures* (see appendix E).

Our evaluation and conclusions for the proposed modifications to the *FERC Plan* and *Procedures* are presented in table 2.6-1.

TABLE 2.6-1			
<b>Summary of Proposed Modifications to the <i>FERC's Plan</i> and <i>Procedures</i></b>			
Reference	Description	Proposed Revision <u>a/</u>	FERC Staff Conclusion
<i>Plan</i> at II.A.1	The number and experience of EIs assigned to the Project shall be appropriate for the size and the number/significance of resources affected.	The number and experience of Environmental Inspectors assigned to the Project shall be appropriate for the size <b>of the construction area, the level of activity</b> , and the number/significance of resources affected.	No substantive change.
<i>Procedures</i> at VI.A.6	Do not locate aboveground facilities in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with U.S. Department of Transportation regulations.	<b><i>Project facilities are proposed to be constructed within wetlands to be permanently filled as part of the Project, primarily due to logistical concerns and available space limitations. All wetland impacts will be appropriately mitigated, and construction of the aboveground structures will result in no net loss of wetlands. Gulf LNG will provide copies of the wetland delineation report, wetland mitigation plans, and COE/MDMR permits and approvals prior to Project construction.</i></b>	Appears justified. Wetlands within the Project site preclude avoidance.
<i>Procedures</i> at VI.B <u>b/</u>	WETLAND CROSSINGS, INSTALLATION	<b><i>Project access roads, including the heavy haul road from the North Supply Dock will be constructed in delineated wetland areas. Additionally, Gulf LNG proposes to clear and fill wetland areas at CSA-5 to maximize the useable area of the site for construction support. Gulf LNG will provide appropriate mitigation for the unavoidable loss of wetlands due to Project construction. Gulf LNG will provide copies of the wetland delineation report, wetland mitigation plans, and COE/MDMR permits and approvals prior to Project construction.</i></b>	Appears justified. Wetlands within the site preclude avoidance.

TABLE 2.6-1

**Summary of Proposed Modifications to the *FERC's Plan and Procedures***

Reference	Description	Proposed Revision <u>a/</u>	FERC Staff Conclusion
<i>Procedures</i> at VI.D	WETLAND CROSSINGS, POST-CONSTRUCTION MAINTENANCE AND REPORTING	<b><i>Wetlands within the Project footprint will be permanently filled and mitigated for by creation of tidal marsh at an off-site location. Design, construction, and monitoring of the mitigation site will be by approval of the COE, MDMR, and other regulatory agencies. Gulf LNG will file copies of its plans, approvals, and monitoring reports with the Secretary for review and approval by the Director.</i></b>	Appears justified. Wetlands within the site preclude avoidance.
a	Modifications to the <i>FERC Plan and Procedures</i> are depicted in <b><i>bold italic</i></b> font.		
b	See section 4.4.2.2 for additional information regarding <i>Procedures</i> section VI.C.5.		

## 2.6.1 Terminal Expansion

### 2.6.1.1 Site Preparation

Gulf LNG would clear all construction work areas of shrubs, trees, and other obstructions. In accordance with the *Gulf LNG Plan*, Gulf LNG would install temporary erosion controls immediately after initial disturbance of the soil to minimize erosion and maintain these controls throughout construction or until permanent erosion control measures are installed.

The site would be graded and filled where necessary to create a reasonably level working surface to allow safe passage of construction equipment and materials. The areas to be developed within the existing Terminal would be raised to an elevation of 12.0 to 13.0 feet NAVD in the process area and to an elevation of 12.0 feet NAVD in other areas. Gulf LNG would remove about 1,524,600 cy of dredged material from the BCDMMS. This equates to about 7 feet of material it would remove from the BCDMMS. Gulf LNG estimates that it would use 20 percent (304,920 cy) of BCDMMS material and about 770,080 cy of fill (preferably from the COE Tombigbee Project) to raise the grade of the Terminal Expansion site. The remaining 1,219,680 cy of BCDMMS material would be disposed of at an approved upland site. An additional 323,000 cy of fill from the COE Tombigbee Project would be used as fill material for the off-site wetland mitigation site (see section 4.4.3).

### 2.6.1.2 Storm Protection System Installation

Expansion of the existing storm protection system would entail extending the existing storm surge protection wall and the existing COE berm to encompass the Terminal Expansion site.

#### Storm Surge Protection Wall

Gulf LNG would clear the storm surge wall construction work area of shrubs, trees, and the first 12 inches of organic matter. Gulf LNG would excavate the area to a depth of 1 foot above msl. The excavated area would be filled with a layer of geotextile fabric followed by clean sand to a height of 3.5 feet above msl. A layer of geogrid material would be placed onto the sand layer followed by stone to bring the elevation to 6 feet above msl. The concrete wall would be constructed on a foundation slab,

which would be supported by pilings. The new concrete wall would be tied into the existing concrete wall on the west and the extension of the existing COE berm on the east. The new concrete wall would have a top elevation of 27 feet NAVD.

### **Extension of the Existing Army Corps of Engineers Berm**

As with the new concrete wall, Gulf LNG would clear the berm work area of shrubs, trees, and the first 12 inches of organic matter. Geotextile fabric followed by geogrid material would be placed along the footprint of the berm followed by a sheet pile driven into the center of the berm. Sand would be placed to an elevation of 4 feet above grade. Once the berm height reaches 4 feet above grade, the berm material would transition to clay fill. Gulf LNG would continue to spread and compact clayey sand. Crushed stone would then be placed on the top of the berm to reach an elevation of 27 feet NAVD.

#### **2.6.1.3 Terminal Piping and Equipment Installation**

Gulf LNG would construct the majority of the facilities for the Project on-site. However, some package systems and pipe racks would be assembled off-site, delivered to the Terminal Expansion site, and assembled there.

Upon completion of the site preparation activities, Gulf LNG would initiate construction of the foundations, pipe racks, liquefaction trains, flares, major mechanical equipment, buildings, process and utility piping, electrical components, and instrumentation. Underground piping would be installed first. Gulf LNG would install any necessary underground pipe and utilities (e.g., electrical conduits) about 3 feet to 5 feet below the finish grade. This would be followed by construction of foundations, including pilings necessary for the buildings, major equipment, and pipe racks. Next, Gulf LNG would complete the pipe racks, followed by the installation of process and utility piping and cable trays, setting of the major equipment, and the establishment of piping, electrical, and instrumentation tie-ins.

About 19,500 14-inch to 18-inch-square precast pre-stressed concrete piles would be required for the liquefaction facilities and firewater tank at the Terminal Expansion. The piles would be delivered to the site by truck or barge to the supply docks. The depths to which the piles would be driven would vary but is expected to be no greater than -113 feet NAVD. After pile driving is complete, Gulf LNG would install pile caps at the top of each pile, which would consist of rebar and poured concrete. Onshore pile driving methodology would be determined during the detailed design phase of the Project. However, Gulf LNG anticipates the majority of onshore pile driving would utilize an impact hammer.

When all process equipment is installed and electrical, mechanical, and other instrumentation work completed, key pre-commissioning activities would commence, including the following:

- conformity checks on each part or piece of equipment to ensure proper installation;
- flushing and cleaning of equipment; and
- leak testing of piping and storage tanks.

After all pre-commissioning activities are complete, Gulf LNG would clean and pneumatically pressure test cryogenic piping. Pneumatic pressure tests of cryogenic piping would be conducted at 1.5 times the operating pressure and held for 1 hour. Gulf LNG would hydrostatically test non-cryogenic piping using clean water (see sections 4.3.1.2 and 4.3.2.2 for further information on hydrostatic test water). Hydrostatic testing of process equipment would be conducted at off-site fabrication shops.

#### 2.6.1.4 Supply Docks

Gulf LNG would install the North and South Supply Docks during the early stages of construction to allow for the transfer of large equipment and significant volumes of materials to the Terminal Expansion construction site. Each supply dock would be constructed with AZ 18-700 steel sheet piles driven into the ground to a depth of 32 feet below msl, with a top elevation of 8 feet above msl. The North Supply Dock would be a T-shaped platform about 280 feet wide along the shoreline and 110 feet wide in the water requiring 1,070 linear feet of sheet piles. The South Supply Dock would be a trapezoidal shaped concrete platform measuring 200 feet along the shoreline and extending 40 feet into Bayou Casotte at the dock's northern end and 100 feet into Bayou Casotte at the dock's southern end requiring 590 linear feet of sheet piles. Barges would be moored to the docking area using wires and lines tied to bollards.

The supply docks would be constructed in segments beginning at the shoreline. First, Gulf LNG would create an access berm of granular fill material along the perimeter of the supply docks. The access berm would be used to support the pile driving crane. The pile driving crane would move from the shoreline onto the access berm in order to install the sheet piles that would make up the supply docks. The granular fill material used to create the access berms would remain inside the sheet piles and become part of the supply dock.

When the perimeters of the supply docks are completed, structural fill would be brought up to an elevation that corresponds to the bottom of the bulkhead tie rod systems. Gulf LNG estimates the North Supply Dock would require 22,000 cy of fill and the South Supply Dock would require 6,000 cy of fill. Fill material would be obtained from a local supplier.

Figures 2.2-1 and 2.2-2 provide conceptual designs for the proposed supply docks. Creation of the supply docks would require dredging of about 100,000 cy of sediment for each dock to a depth of 12 feet below msl. Dredging would extend about 1,200 feet from the shoreline at the North Supply Dock and about 1,000 feet from the shoreline at the South Supply Dock. Gulf LNG anticipates that maintenance dredging of up to 20,000 cy would be required annually to maintain the appropriate depth for the barges. Gulf LNG sampled and tested the sediments, and no contaminants of concern were present in the samples (see section 4.2.7).

Gulf LNG initially planned to dispose of dredge materials from construction of the supply docks at one of two state-approved Beneficial Use (BU) sites: Greenwood Island and Round Island. However, the Greenwood Island site is expected to reach capacity prior to construction of the Project and Round Island is privately owned and not expected to be available. According to Gulf LNG, the Greenwood Island site is expected to be expanded 250-acres by February 2020. Gulf LNG would prefer to use a BU site for disposal and would work with federal and state agencies to identify a suitable BU site for dredge material disposal. Gulf LNG would utilize the existing offshore dredged material disposal site, if a suitable BU site is not available.

Steel sheet piles driven to a depth of 32 feet below msl with a vibratory hammer would be used to construct both supply docks. Sheet piles for both supply docks would be installed using shore-based equipment. It is expected that construction of the South Supply Dock would take about 65 days while the North Supply Dock take about 120 days. Both docks are expected to be completed between April 2020 and November 2020.

The heavy haul road extending from the North Supply Dock would be about 40 feet wide and 890 feet long and retained during operations while the heavy haul road from the South Supply Dock would be 40 feet wide and 737 feet long. Both would be constructed with a crushed stone and geotextile fabric

base. A portion of the South Heavy Haul Road (390 feet) would be retained by Gulf LNG during operations to access the flare tower. The remainder of the heavy haul roads would be removed.

#### **2.6.1.5 Site Restoration**

The area within the expanded storm surge protection system, the North Supply Dock, and the North Heavy Haul Road would be used during operation of the facility and would not be restored until the Project is terminated. The South Supply Dock would be removed and the area affected restored, along with the portion of the South Heavy Haul Road from the dock to the flare tower. Except for CSA-3, the CSAs would be restored to owner specifications after construction. Gulf LNG currently owns CSA-3, uses the property for warehousing and equipment storage, and would continue that use of the site during and after Project construction.

#### **Pipeline Modifications**

Construction of the interconnection and metering modifications would require excavation adjacent to the existing facilities within the existing fenced and graveled areas, with the exception of 0.1 acre of temporary workspace outside the fence line of the existing Gulfstream Meter Station but within the existing pipeline right-of-way. At the Destin Meter Station and Transco/FGT Interconnection, only limited clearing and grading activities would be necessary, and site cleanup would involve replacing gravel on previously graveled areas and restoring surface contours. Vegetation within the 0.1 acre at the Gulfstream Meter Station would be restored in accordance with the *Gulf LNG Plan*. All modifications would be constructed in accordance with the requirements of 49 CFR 192.

### **2.6.2 Special Construction Procedures**

#### **2.6.2.1 Road, Railroad, and Foreign Pipeline Crossings**

The proposed Project would not cross any roads, railroads, or foreign pipelines.

#### **2.6.2.2 Residential Areas**

Based on aerial imagery interpretation and site surveys, no residences would be within 50 feet of the Project. The closest residence to the Terminal Expansion is 9,400 feet from the Terminal Expansion site.

### **2.6.3 Construction Support Areas**

Preparation of the CSAs would begin with marking and staking the CSA boundaries and limits of the construction work space, including access roads or entrances from public roads to the CSAs. Fencing would be installed along the borders of sensitive areas within the CSAs that are not to be used for the Project. After the marking is completed, Gulf LNG would install silt fencing, clear and grub areas of vegetation, fill and/or grade areas as required to create safe working areas, and gravel the working portions of the site where appropriate.

## **2.7 OPERATION, MAINTENANCE, AND SAFETY PROCEDURES**

### **2.7.1 Terminal Expansion**

#### **2.7.1.1 Summary of Operation**

Gulf LNG would receive feed gas through the existing Gulf LNG Pipeline, treat the gas to remove contaminants and heavy hydrocarbon components, liquefy the treated gas by cooling it to -256 °F to create LNG, transport the LNG in cryogenic pipelines to the existing LNG storage tanks for storage prior to export. Gulf LNG would pump the LNG from the storage tanks into cryogenic pipelines that lead to the marine berth where it would be loaded onto LNG carriers. The expanded Terminal would retain the ability to import LNG, regasify it, store it, and transport it to inter- and intrastate pipelines through the existing Gulf LNG Pipeline.

LNG carriers would follow the currently approved transit to the berthing facility and load LNG while discharging ballast water. LNG carriers would also use water from Bayou Casotte for engine cooling. Estimated intake rates and volumes of cooling and ballast water are addressed in section 4.3.2.

Gulf LNG would operate its Terminal Expansion facilities consistent with federal requirements for LNG facilities (see table 1.5-1), which include operation, emergency, and security procedures. Gulf LNG would update all current manuals as necessary to include the expanded Terminal Expansion operations and submit amendments to the agencies prior to commissioning the Terminal Expansion facilities.

Gulf LNG would modify its maintenance regime, which includes corrective and preventative maintenance plans, to include the expanded Terminal facilities. The plans include written procedures consistent with corporate policy and federal standards, including the USCG and DOT regulations at 33 CFR 127.401 and 49 CFR 193 Subpart G, respectively. Gulf LNG would train its operators to respond to potential hazards associated with the liquefaction process and the proper operations and maintenance of all equipment.

Gulf LNG must site, design, construct, operate, and maintain safety controls in accordance with DOT's *Federal Safety Standards for Liquefied Natural Gas Facilities*, 49 CFR 193. In particular, pursuant to the provisions of the Natural Gas Pipeline Safety Act (49 USC 60101 et seq.), as amended, the Terminal Expansion would be operated and maintained in accordance with the Federal Safety Standards for Liquefied Natural Gas Facilities.

#### **2.7.1.2 Spill Containment System**

Gulf LNG would construct separate containment systems for refrigerant and LNG to contain the materials in the event of an accidental release. The refrigerant containment system would be sited, sized, and designed in accordance with the requirements of API 2510 and NFPA 30, and the LNG containment system would be sited, designed, and constructed in accordance with the requirements of 49 CFR 193.2051 through 193.2181. Spill containment system operation, maintenance, and safety information is presented in section 4.12.

#### **2.7.1.3 Hazard and Fire Detection System**

The existing Terminal system provides alarm signaling and notification when a hazardous condition is present. Gulf LNG would expand the fire and gas detection system for the existing Terminal to protect the Terminal Expansion and hardwire it to the main alarm control system. The following are

design and operating features of the hazard detection system that would be installed throughout the expanded Terminal:

- low temperature detectors;
- ultraviolet/infrared flame detectors to indicate ignition of flammable vapors;
- high temperature detectors;
- combustible gas detectors;
- smoke detectors; and
- closed circuit television systems.

#### **2.7.1.4 Firewater System**

As noted above, the firewater delivery system would be expanded to meet the firefighting needs of the expanded Terminal. The expanded firewater system would be designed in accordance with the requirements of the NFPA 59A.

Gulf LNG would obtain water from the Port of Pascagoula's Industrial Water Supply for the firewater system. The existing firewater storage tank would be decommissioned and a new carbon steel firewater storage tank would be installed. The new firewater storage tank would provide a minimum of 1,100,000 gallons of firewater. According to Gulf LNG, the firewater tank would be internally inspected every 5 years to determine if tank cleaning/draining would be needed. If the firewater tank required cleaning, Gulf LNG would lower the water level over a 10 day period. The firewater tank water would drain to the ground and collect at Outfall 2 where Gulf LNG would visually inspect the water for solids and sheens and collect pH measurements prior to discharge.<sup>4</sup> Gulf LNG estimates that the firewater tank would not require cleaning more than once over a 20-year period.

#### **2.7.1.5 Emergency Shutdown System**

The existing Terminal has an emergency shutdown system to allow for the safe termination of operations in the event of an incident. Initiation of the shutdown sequence is either manual, by means of hand-operated stations throughout the facility, or automatic, based on information originating from the various hazard detectors positioned at critical locations in the facility. The emergency shutdown system allows for the shutdown of the entire facility or individual sections, depending on the particular incident. Alarms are provided in the control room to notify operating personnel, should a potentially hazardous condition be detected by the field instrumentation.

Gulf LNG would modify the emergency shutdown system to extend the emergency shutdown measures to the expanded Terminal. Additional information on the shutdown system of the expanded Terminal is presented in section 4.12.

#### **2.7.1.6 Emergency Response Plan**

The existing Terminal has an ERP that conforms to the requirements of 49 CFR 193.2509 and the FERC's Order for the existing Terminal (FERC, 2007). The key elements for the ERP are listed below:

- identification, assessment, and mitigation of the hazards;

<sup>4</sup> Gulf LNG would work with the MDEQ to develop effective treatment methods for outfalls which may include the use of filter covers (accession number 20190107-5151).



- prompt notification and mobilization of emergency response resources; and
- development and maintenance of appropriate emergency response capabilities.

The ERP and operating procedures are used by Terminal personnel, as well as for developing emergency procedures with third-party emergency responders, and in continuing liaison with appropriate agencies, such as local fire departments, police departments, and medical facilities. Prior to commissioning the Terminal Expansion, Gulf LNG would update the existing ERP to incorporate revisions required due to operation of the Terminal Expansion. The updated ERP would include any additional or specialized training or fire response requirements that may be required or recommended to support the addition of new products and components. As part of the update, Gulf LNG would work with local mutual aid organizations as well as emergency response subject matter experts to identify any additional coordination, response equipment, or training that may be anticipated for the additional facilities.

### **2.7.2 Pipeline Modifications**

Gulf LNG must operate and maintain all of its pipeline facilities, including the proposed modifications, in accordance with the DOT regulations in 49 CFR 192, other applicable federal and state regulations, and in accordance with industry standard procedures designed to ensure the integrity of the pipeline and minimize the potential for pipe failure.