5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF THE STAFF'S ENVIRONMENTAL ANALYSIS

The conclusions presented in the section are those of the environmental staff of the FERC and the Coast Guard. The Coast Guard's LOR will address the suitability of the Matagorda Ship Channel for LNG ship transportation. The Coast Guard's LNG Operations Plan will address issues related to the public impact of safety or security zones for LNG vessels. Likewise, the COE will present its own conclusions and recommendations in the dredging and wetland permits it may issue pursuant to Section 10 of the River and Harbors Act and Section 404 of the CWA. The EPA has the authority to review and veto the COE decisions on the Section 404 permits.

Review of the information provided by Calhoun Port Comfort and further developed from data requests; field investigations; scoping; literature research; alternatives analysis; comments from federal, state, and local agencies; and input from individual members of the public indicates that the proposed Calhoun LNG Terminal and Pipeline Project is unlikely to result in significant adverse environmental impact on particular resources within the Zones of Concern because it is unlikely that a substantial cargo release would occur. In addition, we conclude that if the proposed Calhoun LNG Terminal and Pipeline Project were constructed and operated in accordance with applicable laws and regulations, Calhoun Port Comfort's proposed mitigation, and the additional mitigation recommendations presented in section 5.2, it would be an environmentally acceptable action. Although many factors were considered in this determination, the principal reasons are:

- the proposed LNG vessels and associated escort vessels would utilize an existing shipping corridor currently used by other deep-draft vessels;
- dredge spoil would be disposed of at existing dredged material disposal areas;
- safety features would be incorporated into the design and operation of the terminal facilities and LNG vessels;
- the proposed pipeline would parallel existing rights-of-way for approximately 93.2 percent of its length;
- Calhoun Port Comfort would implement our Plan and Procedures to minimize construction impacts on soils, wetlands, and waterbodies;
- the proposed Project would have no effect or would not be likely to adversely affect any federally- or state-listed threatened or endangered species;
- the Coast Guard's preliminary finding that the waterway is suitable for increased LNG vessel traffic (with conditions), the security provisions, and operational controls that would be imposed by the local pilots and the Coast Guard to direct movement of LNG ships would maintain the risks of a marine LNG spill, either with or without ignition, at acceptable levels;
- the environmental and engineering inspection and mitigation monitoring program for this Project would ensure compliance with all mitigation measures and conditions of any FERC authorization;

- the navigational controls and marine transit safety and security measures make the likelihood of a spill from LNG vessels extremely remote; and
- all appropriate consultations with the FWS, NOAA NMFS, SHPO, and ACHP, if required, and any appropriate compliance actions resulting from these consultations, would be completed before construction would be allowed to start in any given area.

In addition, we have developed specific mitigation measures (presented in the individual resource discussions in section 4.0 of this EIS) to further reduce the environmental impact that would otherwise result from construction of the various Project components. The additional studies or field investigations which we recommend typically result in site-specific mitigation and further reduction of impact; therefore, we are recommending that these mitigation measures be attached as conditions to any authorization issued by the Commission. These mitigation measures are presented in section 5.2. We believe that the recommended mitigation measures would reduce potential environmental impacts from Calhoun Point Comfort's proposed actions to environmentally acceptable levels.

The discussion below summarizes the environmental impacts and the proposed or recommended mitigation for each resource analyzed in this EIS.

5.1.1 Geology

Construction and operation of the proposed Project would have minimal impact on geological resources. The existing topography at the LNG terminal site would be permanently altered by the excavation and dredging of an unloading slip for the marine terminal. The natural topographic slope and contours along the proposed pipeline route would be temporarily altered by grading and trenching activities. However, Calhoun Point Comfort would restore topographic contours and drainage conditions to the extent practicable to preconstruction conditions following installation of the pipeline.

Twelve oil and gas production wells are located within 150 feet of the proposed pipeline construction right-of-way; however, eight of these wells are dry and the operational status of the remaining four wells is uncertain. Prior to construction, Calhoun Point Comfort would conduct a detailed survey of the project area to identify the exact locations of these wells in relation to the pipeline. Construction of the proposed pipeline would not affect these wells. No geologic hazards would be expected to affect the proposed facilities.

The proposed terminal would be located in an area classified as a low seismic risk. Additionally, Calhoun Point Comfort determined that there is a low risk of soil liquefaction at the terminal site. Since the LNG storage tanks would be constructed on pilings which extend to a stable zone of the substrate, liquefaction is not a concern.

The effects of an LNG spill, whether ignited or unignited, at the terminal site or along the transit waterways would not result in significant impacts to geological resources at the terminal site or along the LNG ship transit route.

5.1.2 Soils and Sediments

Construction of the proposed LNG terminal would permanently affect about 73 acres of land which are composed of dredge spoil. Construction of the pipeline would temporarily impact about 221.7 acres of prime farmland soil. To minimize impacts on soils, Calhoun Point Comfort would implement the FERC's Plan and Procedures during construction and restoration of the proposed Project. Most impacts to soils would be short-term. However, at the five aboveground pipeline facilities 1.7 acres of prime farmland would be permanently impacted. This impact is unavoidable because of the amount of prime farmland in the project area.

CCND would dredge about 2.7 mcy of material from Lavaca Bay for a turning basin and berth. Of this amount, about 2.0 mcy would be for the CCND's turning basin and 0.7 mcy would be for Calhoun Point Comfort's ship berth. As indicated in Calhoun Point Comfort's draft DMMP, the CCND and Calhoun Point Comfort identified DMPAs within Lavaca Bay where it intends to dispose of, and permanently store, dredged material. The DMPAs have the capacity to accommodate the 2.7 mcy of material that would be dredged for the turning basin and the ship berth, as well as an estimated 9.2 mcy of dredged material that would result from future maintenance dredging. CCND would be required to obtain a permit from the COE prior to dredging. The DMMP would also need approval by the COE.

LNG ship and associated escort vessel traffic would minimally increase sedimentation from prop wash and shoreline erosion from wave action.

The effects of an LNG spill, whether ignited or unignited, at the terminal site or along the transit waterways would not result in significant impacts to soils and sediments at the terminal site or along the LNG ship transit route.

5.1.3 Water Resources

Groundwater

Construction and operation of the proposed Project would not have a significant impact on groundwater resources in the project area. No groundwater impacts are expected to occur as a result of the LNG marine traffic along the transit route. There are no municipal or commercial water wells within 400 feet of the proposed construction workspaces associated with the LNG terminal, pipeline, or laterals. Four private water supply wells are near the Point Comfort Pipeline construction right-of-way and are used for livestock, residential consumption, and irrigation. Calhoun Point Comfort would offer pre- and post-construction testing of all wells within 150 of the construction right-of-way. Should these wells be impacted during construction, Calhoun Point Comfort would restore or replace the wells, or if necessary, provide an alternate source of water. The greatest potential for impact on groundwater would be from spills, leaks, or other releases of hazardous substances during construction or operation. Calhoun Point Comfort has agreed to implement the FERC's Procedures, which includes the use of Spill Prevention and Response Procedures that meet state and federal requirements; and has developed a draft *Water Quality Management Plan*, which includes a SPCC Plan addressing potential spills of fuel, lubricants, and other hazardous materials.

Surface Water

Construction of the terminal's new ship turning basin would impact about 49 acres of open water as a result of dredging and 13.2 acres would be affected by proposed excavation and dredging of the LNG ship berth. Water quality in the area would be temporarily affected by increased turbidity during dredging, but would return to preconstruction conditions following completion of dredging. CCND would be required to obtain several permits that would address dredging and dredge material management, including permits from the COE under Section 404 of the CWA and Section 10 of the Rivers and Harbor Act.

The proposed pipeline would cross 65 surface waterbodies. Eleven of these waterbodies would be crossed using the horizontal directional drill method, fourteen waterbodies using the bore method, and the remaining 40 waterbodies using the open-cut method. To minimize impact on surface waters, Calhoun Point Comfort would implement the protective measures in the FERC's Procedures. Calhoun Point Comfort would be required to obtain permits for crossing these waterbodies including a state permit for Section 401 of the CWA.

In the event of an accidental spill of oil, gas, lubricants, or other hazardous materials during construction or operation, Calhoun Point Comfort would follow the measures outlined in its draft *Water Quality Management Plan* and SPCC Plan. In addition, LNG vessels calling at the LNG terminal would be required to have a vessel response plan that satisfies Coast Guard requirements and applicable international standards. Stormwater discharges from defined contributing drainage areas would be directed to EPA NPDES and TRRC-permitted outfalls with Individual Permit coverage. A Stormwater Pollution Prevention Plan would also be prepared to comply with NPDES requirements for stormwater runoff from areas of the LNG facility that are not covered by Individual NPDES or Texas Permit authorization.

Operational impacts of the LNG terminal on surface waters would include periodic maintenance dredging of the ship terminal basin. As part of its maintenance plan, the CCND and Calhoun Point Comfort estimate that 184,000 cubic yards of material would be dredged from the turning basin and ship berth on an annual basis. Over a 50-year planning period for maintenance dredging about 9.2 mcy of material would be dredged from these areas. The DMPAs that would be used for the project as currently proposed could accommodate this additional 9.2 mcy of material.

As with other large cargo ships, LNG vessels would take on some ballast water to maintain stability and trim as they offload their cargo, but they would not be fully loaded when departing the proposed terminal. Over the life of the proposed project, withdrawal of ballast water would constitute an intermittent minor impact to the water resources of Matagorda and Lavaca Bays.

The effects of an LNG spill, whether ignited or unignited, at the terminal site or along the transit waterways would not result in significant impacts to water resources at the terminal site or along the LNG ship transit route.

5.1.4 Vegetation

Wetland Vegetation

No tidal wetlands or vegetated tidal flats would be impacted at the LNG terminal site; however, approximately 11 acres of intertidal wetland, including 1.6 acres of fringe and 9.4 acres of high marsh, would be permanently filled as a result of proposed dredged material placement. Construction of the proposed pipeline would affect about 20.6 acres of wetlands, while operation of the proposed pipeline would result in the permanent conversion of 0.7 acre of forested wetlands to emergent wetlands for the life of the Project. Of the total amount of wetlands temporarily affected, about 17.5 acres would be emergent, 0.4 acre would be scrub-shrub, 0.8 acre would be forested, and 2.0 acres would be emergent/forested mix. During construction, Calhoun Point Comfort would minimize impact on wetlands by implementing measures in the FERC's Procedures.

Calhoun Point Comfort consulted with the FWS, COE, NOAA Fisheries, and the TGLO regarding the development of a mitigation plan that would compensate for impacts to wetlands and discuss wetland mitigation options associated with the proposed Pipeline. Based on its consultations, Calhoun Point Comfort prepared a *Draft Wetland and Waters of the U.S. Mitigation Plan* which considers three wetland mitigation options to compensate for unavoidable wetland losses: (1) on-site mitigation/restoration, (2) off-site restoration, and (3) mitigation banking. Based on Calhoun Point Comfort's meeting with the FWS, COE, NOAA Fisheries, and TGLO, Calhoun Point Comfort's proposed mitigation option to compensate for forested wetlands impacts would be to purchase wetland credits from a COE approved wetland mitigation bank. Consultation between Calhoun Point Comfort and the agencies regarding mitigation efforts is on-going and we are recommending that Calhoun Point Comfort file this plan with us prior to construction of the proposed Project.

Several wetlands exist along the waterways leading to the proposed terminal. Impacts to these wetlands from typical LNG vessel traffic would not be significant. However, in the unlikely event that a spill of LNG were to occur along the vessel transit route, impacts on wetlands within Zone 1 could be significant; however, the likelihood of an LNG spill is extremely remote.

Terrestrial Vegetation

Calhoun Point Comfort's proposed 73-acre terminal site consists of disturbed, undeveloped, manmade industrial land that is sparsely vegetated with grasses. The 416.6 acres of land affected by the proposed pipeline route consists open, woodland and developed lands. Installation of the proposed pipeline would not affect agricultural uses. The permanent pipeline easement in open land would be kept in an herbaceous state.

Construction and operation of the proposed Project would result in the temporary loss of vegetation and the permanent conversion of some lands to industrial lands. To minimize impacts associated with the loss of vegetation, Calhoun Point Comfort would implement the FERC's Plan to minimize erosion during and after construction of the Project and to enhance the revegetation of disturbed areas.

The effects of an LNG spill, whether ignited or unignited, at the terminal site or along the transit waterways would significantly impact vegetation; however, the likelihood of a spill is extremely remote.

5.1.5 Wildlife and Aquatic Resources

Terrestrial Wildlife

Impacts to wildlife resulting from construction and operation of the proposed Project would include the temporary alteration and permanent loss of habitat. Impact to wildlife would occur as a result of the permanent conversion of about 76.5 acres of upland habitat to industrial use at the proposed terminal site and at the aboveground pipeline facilities. This conversion to industrial use would represent a loss of wildlife habitat; however, impacts resulting from this loss would be minimal since the majority of the loss would be from the LNG terminal site where the existing habitat consists of unmanaged dredge material.

Additional impacts to wildlife associated with the proposed pipeline would result from clearing activities during construction. During operation of the pipeline, relatively little vegetation maintenance would be required due to the large percentage of agricultural land crossed. Calhoun Point Comfort would avoid vegetation maintenance during the peak nesting period between April 15 and August 1 of any year. If vegetation clearing must be conducted during this time, Calhoun Point Comfort would survey for all migratory bird nests prior to commencing work. In addition, if an active migratory bird nest is found along the construction right-of-way, Calhoun Point Comfort would consult with the FWS to identify the most appropriate measure that should be taken to avoid or minimize impacts.

We do not expect wildlife to be significantly impacted by the proposed Project. Once construction is completed and work areas restored, wildlife could re-occupy open available habitat. The majority of the LNG terminal site is currently unmanaged dredged material with limited usefulness as wildlife habitat.

Aquatic Resources

Impacts to aquatic organisms including the burial of organisms, and the removal and conversion of habitat would result primarily from proposed dredging activities. About 35 acres of oyster reef would be impacted by the proposed dredging and dredged material disposal. To mitigate for this impact, Calhoun Point Comfort would create about 63 acres of oyster reef during dredged material placement. We believe that with this mitigation there would be no significant impacts on oysters or oyster reef habitats.

Other impacts could result from increased turbidity and noise associated with dredging and LNG vessel operations. Additionally, the withdrawal of ballast water intake by LNG ships could result in loss of organisms by direct removal or entrainment. We believe that these effects would be localized, short-term, and minor.

NOAA Fisheries identified EFH for three shellfish species (subadult pink shrimp, and juvenile and subadult white and brown shrimp) and two species of finfish (adult red drum; adult and subadult Spanish mackerel). Based on our EFH assessment, NOAA Fisheries has provided

several EFH conservation recommendations to offset adverse project impacts to EFH which have been addressed in this EIS.

LNG marine traffic would cross through EFH for white shrimp, brown shrimp, red drum, and Spanish mackerel in Matagorda and Lavaca Bays. Normal ship operations would not have significant impacts on this EFH.

The effects of an LNG spill, whether ignited or unignited, at the terminal site or along the transit waterways could significantly impact terrestrial wildlife and aquatic resources including EFH; however, the likelihood of a spill is extremely remote.

5.1.6 Threatened, Endangered, and Other Special Status Species

The FWS and NOAA Fisheries have identified a total of 22 federally listed endangered or threatened species that may potentially occur in the Project area. With the exception of the bald eagle and the West Indian manatee, the FWS and the NOAA Fisheries have concurred with our determinations that the proposed Project would have no effect, or is not likely to adversely affect, these species. Based on agency consultations, Calhoun Point Comfort prepared a bald eagle management plan that provides guidance on the protection of bald eagles and their habitat during construction. We are recommending that Calhoun Point Comfort consult with the FWS and TPWD regarding distances of primary and secondary management zones, should a bald eagle nest site be identified along the Point Comfort Pipeline construction right-of-way, and finalize its bald eagle management plan prior to construction. Additionally, we are recommending that Calhoun Point Comfort should implement several measures to protect the West Indian manatee. Because Section 7 consultation with the FWS is not yet complete, we are also recommending that Calhoun Point Comfort not begin construction until the FERC staff completes all consultations with FWS.

Along the LNG transit waterway, there are several important bird breeding areas, including areas used by brown pelican. The two largest and most consistently productive bird rookeries are at Sundown Island and Snake Island. Noise-related impacts to these bird rookery islands could occur from normal operation of LNG vessel traffic within the MSC; however, we do not believe that the noise generated by the LNG ships, with or without tugs, would significantly affect the two bird rookery islands since birds in these rookeries are accustomed to noise from existing ship traffic within the MSC.

The effects of an LNG spill, whether ignited or unignited, along the transit waterways could potentially affect the brown pelican and/or piping plover. For the pelican, any incident near Sundown Island or Snake Island during the nesting season (March to August) could have a significant impact on the breeding populations found on these islands. An incident in the bay inlet between the jetties could affect piping plover during the winter months; however, this is winter feeding habitat for the plover, and not breeding habitat for this species. The probability of an LNG release large enough and close enough to Sundown Island or Snake Island, or feeding habitat near the bay inlet, to cause a significant impact is extremely low.

5.1.7 Land Use, Recreation, and Visual Resources

Construction of the proposed Project would affect a total of about 538.6 acres of land and water. Construction of the LNG terminal would require about 73 acres of land, and about 49 acres offshore within Lavaca Bay for the CCND's turning basin and Calhoun Point Comfort's ship berth. Calhoun Point Comfort's proposed pipeline route would mostly cross open land (i.e., agricultural and range land), following existing easements such as roads and other pipelines. Construction of the proposed pipeline and related facilities would disturb about 416.6 acres of land. Operation of the new facilities would require about 97.7 acres for the permanent easement along the 36-inch-diameter pipeline, 0.8 and 0.9 acre for the permanent easement along the respective 8- and 16-inch-diameter laterals, 2.9 acres for new permanent access roads, and 3.5 acres at the aboveground facilities. The remaining 318.9 acres would revert to prior use.

No existing residences or structures are within one mile of the proposed LNG terminal. The nearest existing residential areas to the proposed LNG terminal are about 2.5 miles north of the terminal within the City of Point Comfort and 3.0 miles west within the community of Port Lavaca. One residence would be located within 50 feet of the proposed construction workspace for the proposed Point Comfort Pipeline. In addition, eight residences within one subdivision would be within the construction right-of-way if the pipeline was constructed using standard construction techniques. However, to avoid and reduce impacts to these residences, Calhoun Point Comfort would cross this area using an HDD. The HDD would install the pipeline in an open area adjacent to the residences. No public lands or special interest areas would be affected by the Project.

The most prominent visual features of the proposed LNG terminal would be two LNG storage tanks, each 133 feet above the current grade and 262 feet in diameter. Calhoun Point Comfort prepared photo simulations of views of the proposed LNG storage tanks from seven observation points. While the LNG storage tanks would be visible, they would be consistent in size and height with the existing structures of industrial facilities along the shoreline, and would not result in a significant visual impact.

Under normal operations, LNG vessels transiting the waterway would have no significant impacts on current land uses, recreation, or visual resources. In the event of an unignited LNG release along the waterway for LNG vessel traffic, the event would be a short-lived and would have no impact on land use, residences or visual resources. Impacts from a marine release of LNG with ignition would depend on the location of the incident within the waterway and the scope of the incident. The impacts could be significant, with damage to man-made structures and vegetation ranging from mild to severe with the greatest impacts occurring within Zone of Concern 1 and decreasing outward through Zones 2 and 3. However, due to the safety and security measures that would be in place, the likelihood of an LNG spill is extremely remote.

The extent of the impact on recreational boaters would depend on the number of boats in the project area during the additional two to three LNG vessel transits per week when LNG ships would call on the LNG terminal, and on several other variables such as the size of the Coast Guard-imposed safety and security zones and the width of the channel at the point where a boat encounters the LNG ship. To minimize potential impacts on other marine traffic, the Coast Guard is expected to use a program of announcements to give advance notice of each moving

safety and moored vessel security zones schedule and could schedule the transit of LNG vessels for times of day less likely to affect recreational boaters.

The proposed LNG terminal, LNG vessel transit route, and a portion of the proposed pipeline would be within the designated coastal zone management area in the state of Texas. Calhoun Point Comfort has submitted a request for, but has not received, its coastal zone consistency determination from the Railroad Commission of Texas. Therefore, we are recommending that Calhoun Point Comfort not begin construction of any component of its proposed Project until it files with the Secretary a copy of the coastal zone consistency determination issued by the Railroad Commission of Texas.

5.1.8 Socioeconomics

Several potential socioeconomic effects may result from construction and operation of the proposed Project. Many of these potential effects are related to construction and include the number of local and non-local construction workers who would work on the Project; their income and local expenditures; and their impact on population, public services, and temporary housing during construction. Other potential effects related to construction include local construction expenditures by Calhoun Point Comfort. Potential economic benefits associated with operation of the proposed Project include increased property tax revenue, increased job opportunities and income, and ongoing local expenditures by the company.

The temporary influx of workers to the area during construction and operation of both the proposed LNG terminal and pipeline would be a nominal addition to the local population and have minimal impact on the availability of housing or the services provided by local government agencies. The localities where the proposed Project would be built would benefit economically from the employment of local workers, the expenditure of payroll money, the purchase of local materials and supplies, and the addition of monies, both one-time and annual tax revenue.

Several small towns along the western shore of Matagorda Bay would be within the Zone of Concern 3 (2.2 miles) of the LNG vessel transit route through the MSC. These are Port O'Connor, Indianola, Magnolia Beach, and Alamo Beach. A portion of Magnolia Beach and Alamo Beach would also fall within Zone of Concern 2. The southern edge of the City of Point Comfort would be within Zone of Concern 3, and a portion of the city (occupied by the Formosa Hydrocarbons plant) would also be within Zone 2.

A substantial unignited LNG release and dispersion would be a short-lived event and may result in the temporary closure of the port. The associated cost of an incident could be up to $50 million and would consist primarily of the cost to transport and repair the LNG vessel. A substantial marine LNG release with ignition resulting in a pool fire may cost more than $650 million and include severe damage to the shore-side facilities; potential total loss of the LNG vessel and cargo; fatalities; and closure of the port for up to 14 days. Local emergency responders who would respond to such incidents would be financially compensated by Calhoun Point Comfort. Local populations in Zones 1-3 could be affected depending on location of the incident relative to the population, the scope of the incident, and whether the LNG released ignited or evaporated. This could be a significant impact with injuries ranging from mild to fatal, being most severe in Zone 1 and decreasing outward through Zones 2 and 3. However, because

of the implementation of safety and security measures during marine transit, the likelihood of a marine spill from an LNG vessel is extremely remote.

5.1.9 Transportation and Traffic

Construction workers commuting to the proposed Project area are expected to add an average of approximately 834 vehicle trips per day. At the peak of construction, a maximum of 1,410 construction worker vehicle trips are expected. Existing roads would provide land access to the LNG terminal site. Access to the pipeline and associated aboveground facilities would be via existing private and public roadways. Because construction would move sequentially along the pipeline route, any transportation impacts would be temporary on any given roadway, and the transportation system would be minimally impacted by construction.

During the 35-month construction period for the terminal, Calhoun Point Comfort estimates that about 293 barges would supply construction material and equipment to the site thereby, resulting in an increase of about 9 barge trips per month. In addition, one dredging barge would be at the turning basin and ship berth site during the last 6 months of construction. This would cause minimal water transportation impacts.

During operation, the LNG terminal would receive up to about 120 LNG ships per year, or between two and three ships per week through the Matagorda Ship Channel. Area boaters are accustomed to commercial ship traffic in the MSC in transit to Alcoa and the Port; so the issue of deep-draft ship traffic in the MSC is not a new issue to commercial shrimpers or recreational boaters that frequent Matagorda Bay or Lavaca Bay.

The impacts to traffic from an ignited or unignited marine LNG release could be significant, depending on where the incident occurred, the scope of the incident, and the time of year the incident occurred. Vessel traffic would be halted until the affected LNG vessel could be safely removed from the river channel. A substantial unignited LNG release and dispersion would be a short-lived event and may result in temporary closure of the port. The associated cost could be up to $50 million and would consist primarily of the cost to transport and repair the LNG vessel. A substantial marine LNG release with ignition resulting in a pool fire may potential result in the closure of the port for up to 14 days. Transportation infrastructure in Zones 1-3 could be affected depending on location of the incident relative to the infrastructure, the scope of the incident, and whether the LNG released ignited or evaporated. This could be a significant impact with damage being most severe in Zone 1 and decreasing outward through Zones 2 and 3. However, because of the implementation of safety and security measures during marine transit, the likelihood of a marine spill from an LNG vessel is extremely remote.

5.1.10 Cultural Resources

The combined archaeological overview and survey of the proposed Project, specifically the Point Comfort Pipeline, resulted in the discovery of one isolated lithic find, one historic surface scatter, and four historic standing structures. We determined that these resources are not significant and not eligible to the National Register of Historic Places and the SHPO concurred with these findings. Calhoun Point Comfort conducted a literature review of its proposed LNG terminal site and concluded that, since the proposed LNG terminal would be constructed entirely on manmade, industrial land that was created by the placement of dredged material from Lavaca Bay and Cox Bay, no further archeological investigations should be required. We agree and the

SHPO concurred with Calhoun Point Comfort's assessment. Calhoun Point Comfort has filed an acceptable Unexpected Discoveries and Emergency Procedure Plan.

No historic markers recommended for listing on the National Register of Historic Sites are within the Zones of Concern. Town sites and cemeteries (sites that are below ground) would not be impacted by ship transit and operation, and are unlikely to be impacted by a spill or fire. There are no sensitive cultural resources, such as buildings or other structures, within the Zones of Concern. Six of the 9 identified shipwreck sites are within Zones 1 and 3. However, because they are submerged and not directly in the ship channel, they would not be affected by an LNG release or fire.

5.1.11 Air Quality and Noise

Air emissions resulting from construction of the proposed Project would be short term and would not significantly affect air quality in the region. Calhoun Point Comfort would utilize BACT for primary pollution control at the facility. Since Calhoun and Jackson Counties are both classified as attainment areas for all criteria pollutants, a General Conformity review of the Project is not required. Calhoun Point Comfort received an air permit for the proposed facility from the TCEQ on December 6, 2005.

Along the LNG transit waterway, LNG vessel and escort vessel emissions affecting any one localized area would be temporary and transient and occur at distances allowing for considerable dispersion before reaching any sensitive receptors. LNG ship and tug emissions, as mobile sources, are exempt from PSD or NNSR permitting.

In order to provide a thorough evaluation of the potential impacts on air quality in the vicinity of the proposed Project, Calhoun Point Comfort conducted a quantitative assessment of project air emissions. The assessment included air dispersion modeling analyses to predict off-site (i.e., ambient) concentrations in the vicinity of the project for both criteria pollutants and hazardous air pollutants resulting from the proposed emissions associated with operation of the project for comparison to federal air quality standards. When the predicted impacts are added to available monitored background concentrations in the vicinity of the project, several maximum impacts would exceed the NAAQS, however these instances would occur over water. Impacts at the facility's property boundary and the closest non-industrial receptor would be below the NAAQS.

LNG vessel traffic along the MSC may result in temporary air quality impacts to the populations in Zones of Concern 2 and 3 along the waterway, as a result of criteria pollutants which at times may be above ambient air quality levels for short periods. Timing and during of impact would be based upon wind speed, direction, number of support vessels, and fuel mixtures. However, the emissions affecting any one localized area along the waterway would be temporary and would occur at distances allowing for considerable dispersion. The long-term impacts associated with the normal operation of the LNG vessels along the waterway would not have a significant impact on air quality.

In the event of a marine LNG spill, any LNG released would vaporize. If the vapor cloud ignited, combustion emissions would be released to the atmosphere. The types and amounts of emissions from the ignition of an LNG pool from a substantial release would depend on many factors, but the emissions to any one localized area would be temporary and would depend on

weather, other conditions at each specific location along the waterway, and the scope of the incident.

Short-term noise impacts related to the LNG vessel transit operations along the waterway would be nearly identical to the existing short-term impacts that occur during the transit of other vessels. The primary source of noise would be emitted by the tugboats' engines. Noise from large tugboats have been measured at 87 dBA at 50 feet from the source. The channel is located a great distance from the shoreline and noise-sensitive receivers. The nearest noise sensitive receivers, which are located at Magnolia Beach, lie approximately 3,000 feet from the channel. This large distance between the noise source and receivers would greatly reduce LNG vessel traffic-related noise levels at these receivers. Transit of LNG vessels along the MSC would not substantially increase ambient noise levels at noise sensitive receivers.

5.1.12 Reliability and Safety

We evaluated the safety of both the proposed LNG import terminal facility and the related LNG vessel transit through the Matagorda Ship Channel. With respect to the onshore facility, we completed a cryogenic design and technical review of the proposed terminal design and safety systems, and have identified specific areas of concern and included recommendations to address these concerns. Compliance with these recommendations would need to be demonstrated by Calhoun Point Comfort before initial site preparation, before construction after final design; before commissioning, or before commencement of service.

Thermal radiation distances were calculated for 1,600 to 10,000 Btu/ft^2-hr incident flux levels for a roof fire on each full containment LNG storage tank. The resulting distances would be 429 feet for the 10,000 Btu/ft^2-hr zone; 742 feet for the 3,000 Btu/ft^2-hr zone; and 923 feet for the 1,600 Btu/ft^2-hr zone. The resulting 1,600 Btu/ft^2-hr zone for the tank impoundment sump would be 668 feet. Flammable vapor hazard distances were calculated for accident scenarios in the tank impoundment and process areas. A spill into the tank impoundment sump resulted in a distance of 1,667 feet to the 2.5 percent average gas concentration. A spill into the two process area sumps resulted in a distance of 694 feet and a spill into the two vaporization area sumps resulted in a distance of 465 feet to the 2.5 percent average gas concentration. Some of these thermal radiation and vapor dispersion distances extend beyond the plant property line and into the water surrounding the site. However, there are no prohibited land uses within these areas. We believe the proposed LNG terminal would satisfy the exclusion zone requirements of 49 CFR 193.2057 and 193.2059. In addition, we have recommended that Calhoun Point Comfort develop an Emergency Response Plan to ensure that boaters would be warned in the unlikely event that a potential exists for fire or vapor dispersing from any of these impoundments.

Although the channel at its current depth would be able to safely accommodate LNG carriers up to 90,000 m^3 in capacity, thermal radiation and flammable vapor hazard distances were calculated for an accident or an attack on a 140,000-m^3 LNG carrier. For 1.0-, 1.4-, 2.5-, 3.0-, and 3.9-meter-diameter holes in an LNG cargo tank, we estimated distances to range from 2,164 to 5,250 feet for a thermal radiation level of 1,600 Btu/ft^2-hr, the level which is hazardous to unprotected persons located outdoors. Based on a 1.0-meter-diameter hole, an unignited release would result in an estimated pool radius of 421 feet. The unignited vapor cloud would extend to 9,776 feet to the LFL and 14,377 feet to one-half the LFL. The results of these calculations are in agreement with the Zones of Concern use by the Coast Guard in assessing waterway

suitability. Flammable vapor dispersion for larger holes was not performed since, realistically, the cloud would not even extend to the maximum distance for a 1.0-meter-diameter hole before encountering an ignition source. However, the evaluation of safety is more than an exercise in calculating the consequences of worst case scenarios. Rather, it is a determination of the acceptability of risk which considers: the probability of events, the effect of mitigation, and the consequences of events. Based on the extensive operational experience of LNG shipping, the structural design of an LNG vessel, and the operational controls imposed by the Coast Guard and the local pilots, the likelihood of a cargo containment failure and subsequent LNG spill from a vessel casualty–collision, grounding, or allision–is highly unlikely. As a result, the risk to the public from accidental spills from LNG carriers should be considered negligible.

Unlike accidental causes, historical experience provides little guidance in estimating the probability of a terrorist attack on an LNG vessel or onshore storage facility. For an LNG import terminal proposal that would involve having a large volume of energy transported and stored near populated areas, the perceived threat of a terrorist attack is a primary concern of the local population and requires that resources be directed to mitigate possible attack paths. While the risks associated with the transportation of any hazardous cargo can never be entirely eliminated, they can be managed.

Calhoun Point Comfort submitted its LOI to the Coast Guard on March 14, 2005, which was received by the Coast Guard on August 15, 2005. It is anticipated that the Coast Guard would decide on an LOR as soon as possible after the Commission issues the final EIS, or wait until after the Commission makes an overall public interest determination of the proposal.

As part of our marine safety analysis, we considered how vessel security requirements for LNG vessels calling on the proposed LNG terminal might affect other ship and boat traffic on the Matagorda Ship Channel. The addition of up to about 120 LNG ships per year would have minor effect on ship traffic on the Matagorda Ship Channel. The extent of the impact on recreational boaters would depend on the number of boats in the project area during the additional two to three LNG vessel transits per week when LNG ships would call on the LNG terminal, and on several other variables such as the width of the channel at the point where a boat encounters the LNG ship. Based on the Coast Guard's review of Calhoun Point Comfort's WSA and consultations, the Coast Guard advised the FERC in its WSR dated June 19, 2006 that to make the Matagorda Ship Channel suitable for the LNG marine traffic associated with the proposed Calhoun Point Comfort Project, specific risk mitigation measures would be necessary and further developed in the Coast Guard's *LNG Vessel TMP*.

While the LOR would address the suitability of Matagorda Ship Channel for LNG vessel transportation, it would not constitute a final authority to commence LNG operations. The safety measures to be imposed may include moored vessel security and moving safety zones around the LNG vessels, escorts by armed law enforcement vessels, and a variety of waterway and shoreline surveillance measures which would be addressed later in the development of the Coast Guard's *LNG Vessel TMP*. This plan would be developed in conjunction with state and local law enforcement and emergency response communities.

An issue that has developed for several LNG terminal projects is a concern that local communities would have to bear some of the costs of ensuring the security/emergency management of the LNG facility and the LNG vessel while in transit and unloading at the dock.

The specific security/emergency management costs for the proposed project are not yet available. The final costs associated with security would be determined after the specific security needs are responsibilities have been established by the Coast Guard through consultations with other federal, state, and local agencies.

Section 311 of the Energy Policy Act of 2005 stipulates that the FERC must require the LNG operator to develop an ERP in consultation with the Coast Guard and state and local agencies before any final approval to begin construction. Therefore, we recommended that Calhoun Point Comfort develop an ERP and coordinate procedures with the Coast Guard; state, county, and local emergency planning groups; fire departments; state and local law enforcement; and appropriate federal agencies. The ERP must include a Cost-Sharing Plan that contains a description of any direct cost reimbursements to any state and local agencies with responsibility for security and safety at the LNG terminal and near vessels that serve the facility.

5.1.13 Alternatives

This EIS addresses alternatives to the proposed actions before the FERC, the Coast Guard, and the COE. In general, the reasonable alternatives before the FERC and the COE are similar. These agencies can deny the project/permits, postpone the issuance of a Certificate/permit/easement pending further study, or issue a Certificate/permit/easement for the Project as proposed or modified by location or condition.

For the Coast Guard, the reasonable alternatives include issuing a negative LOR (essentially the No Action alternative), postponing issuance of an LOR, or issuing an LOR with conditions (the Coast Guard's preferred alternative). The alternative of issuing an LOR without conditions was determined not reasonable in this case and removed from consideration because it did not meet the Coast Guard's purpose and need for issuance of an LOR -- ensuring adequate safety and security of LNG vessel transit. Also, no reasonable alternatives for shipping routes or other variations were identified because the terminal is an existing import facility.

No Action and Postponed Action Alternatives

The No Action and Postponed Action Alternatives (as well as the negative and postponed LOR), would deny or defer the proposed project. While these alternatives would avoid the environmental impacts identified in this EIS, they would also deny the customers and other markets in Texas access to additional supplies of natural gas made available by importation of LNG. This in turn could lead to higher natural gas prices, the use of alternative sources of energy, or alternative proposals to develop natural gas import and transmission infrastructure. While conservation and the development of other sources of energy are anticipated to play a part in meeting the future energy needs of the country, they are not expected to significantly reduce the long-term requirement for additional natural gas supplies. Therefore, we conclude that the No Action and Postponed Action Alternatives are not preferable to the proposed action.

Site and Route Alternatives

Our analysis of system alternatives included an evaluation of the use of existing LNG import and storage systems. None of the existing facilities has the capacity or space to add the capacity proposed in this Project. We also looked at the construction of an offshore terminal to meet the

objectives of the proposed Project. Our review indicates that construction of an offshore alternative would involve a longer pipeline, the construction of a graving dock that would impact the shoreline, and a permanent onshore facility for terminal support activities. Therefore, we do not consider construction of an offshore facility a reasonable alternative to the proposed Project. We also looked at alternative port sites, none of which would provide an environmental advantage over the proposed site.

An alternative to the Coast Guard action of issuing an LOR which finds the waterway suitable for LNG vessel traffic with certain conditions is to issue an LOR without any conditions. This would avoid some of the economic effects related to any moving safety and moored vessel security zones, or other related LNG safety and security activities, which the Coast Guard would determine is necessary prior to the commencement of LNG vessels transiting the waterway. If the Coast Guard postpones issuance of an LOR pending further analysis or study, the effect is expected to be similar to the FERC postponing its action. That is, although it is speculative to predict the resulting effects, postponing issuance of an LOR may lead to Calhoun Point Comfort deciding to delay its entire project.

Our alternatives analysis included the evaluation of three pipeline route alternatives and five route variations. None of these route alternatives or variations would provide an environmental advantage over the proposed pipeline route.

Based on our analysis we have determined that the proposed Calhoun LNG Terminal and Pipeline Project, as modified by our recommended mitigation, is the preferred alternative that can meet the project objectives.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission issues its authorization for the proposed Project, we recommend that the Commission's Order include measures 1 through 79 of the following section. We believe these measures would further mitigate the environmental impacts associated with the construction and operation of the proposed Project.

THE FOLLOWING RECOMMENDED MEASURES APPLY TO BOTH CALHOUN LNG L.P. AND POINT COMFORT PIPELINE COMPANY L.P.

1. Calhoun Point Comfort shall follow the construction procedures and mitigation measures described in its application, supplemental filings (including responses to staff data requests), and as identified in this EIS, unless modified by the Order. Calhoun Point Comfort 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. For pipeline facilities, the Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the Project. This authority shall allow:

   a. the modification of conditions of the Commission's Order; and
   b. the design and implementation of any additional measures deemed necessary (including stop work authority) to assure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from project construction and operation.

3. The authorized facility locations shall be as shown in this EIS, as supplemented by filed alignment sheets, and shall include all of the staff's recommended facility locations. **As soon as they are available, and before the start of construction**, Calhoun Point Comfort shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

4. Calhoun Point Comfort 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 OEP **before construction in or near that area**.

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

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

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

5. Calhoun Point Comfort shall employ a team of environmental inspectors. The environmental inspectors 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.

6. **At least 60 days before the start or construction**, Calhoun Point Comfort shall file an initial Implementation Plan with the Secretary for review and written approval by the Director of OEP describing how Calhoun Point Comfort will implement the mitigation measures required by the Order. Calhoun Point Comfort must file revisions to the plan as schedules change. The plan shall identify:

a. how Calhoun Point Comfort will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to on-site construction and inspection personnel;
b. the number of environmental inspectors assigned per spread, and how the company will ensure that sufficient personnel are available to implement the environmental mitigation;
c. company personnel, including environmental inspectors and contractors, who will receive copies of the appropriate material;
d. the training and instructions Calhoun Point Comfort will give to all personnel involved with construction and restoration (initial and refresher training as the project progresses and personnel change), with the opportunity for OEP staff to participate in the training session(s);
e. the company personnel (if known) and the specific portion of Calhoun Point Comfort's organization having responsibility for compliance;
f. the procedures (including use of contract penalties) Calhoun Point Comfort will follow if noncompliance occurs; and
g. 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 mitigation training of on-site personnel;
   (3) the start of construction; and
   (4) the start and completion of restoration.

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

8. Calhoun Point Comfort shall file updated status reports prepared by the environmental inspectors with the Secretary on a weekly basis **until all construction and restoration activities are complete**. On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

   a. the current 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;
   b. a listing of all problems encountered and each instance of noncompliance observed by the environmental inspectors 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);
   c. corrective actions implemented in response to all instances of noncompliance, and their cost;
   d. the effectiveness of all corrective actions implemented;
   e. 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
   f. copies of any correspondence received by Calhoun Point Comfort from other federal, state or local permitting agencies concerning instances of noncompliance, and Calhoun Point Comfort's response.

9. Calhoun Point Comfort shall develop and implement an environmental complaint resolution procedure. The procedure shall provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. **Prior to construction**, Calhoun Point Comfort shall mail the complaint procedures to each landowner whose property would be crossed by the Project.

   a. In its letter to affected landowners, Calhoun Point Comfort shall:

      (1) provide a local contact that the landowners shall call first with their concerns; the letter shall indicate how soon a landowner shall expect a response;
      (2) instruct the landowners that, if they are not satisfied with the response, they shall call Calhoun Point Comfort's Hotline; the letter shall indicate how soon to expect a response; and
      (3) instruct the landowners that, if they are still not satisfied with the response from Calhoun Point Comfort's Hotline, they shall contact the Commission's Enforcement Hotline at (888) 889-8030.

b. In addition, Calhoun Point Comfort shall include in its weekly status report a copy of a table that contains the following information for each problem/concern:

(1) the date of the call;

(2) the identification number from the certificated alignment sheets of the affected property;

(3) the description of the problem/concern; and

(4) an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

10. Calhoun Point Comfort must receive written authorization from the Director of OEP **before commencing service from the LNG terminal and other components of the Project**. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and other areas affected by the project are proceeding satisfactorily.

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

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

b. identifying which of the conditions of the Order Calhoun Point Comfort has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

12. Calhoun Point Comfort shall not begin construction of the proposed LNG terminal or pipeline until:

a. the Staff completes consultation with FWS; and

b. Calhoun Point Comfort has received written notification from the Director of OEP that construction and/or implementation of conservation measures may begin.

If construction has not begun within 1 year from the date of issuance of the FERC approval of the project, Calhoun Point Comfort shall consult with the appropriate offices of the NOAA Fisheries and the FWS to update the species list and to verify that previous consultations and determinations of effect are still current. Documentation of these consultations, and the need for additional surveys and survey reports (if required), and the NOAA Fisheries and the FWS comments on the surveys and survey reports and their conclusions, shall be filed with the Secretary and the COTP prior to construction.

13. Calhoun Point Comfort shall not begin construction of any component of its Project **until** it files with the Secretary a copy of the coastal zone consistency determination issued by the Railroad Commission of Texas.

THE FOLLOWING RECOMMENDED MEASURES APPLY TO POINT COMFORT PIPELINE COMPANY L.P.

14. Calhoun Point Comfort shall continue its consultation with the COE, FWS, EPA, TPWD, and TGLO to further develop its Wetlands and Waters of the U.S. Mitigation Plan. **Prior to construction**, Calhoun Point Comfort shall file its final plan with the Secretary.

15. Calhoun Point Comfort shall revise its bald eagle management plan to be consistent with the FWS guidelines regarding primary and secondary management zones that would be used should a bald eagle nest site be identified along the Point Comfort Pipeline construction right-of-way. Calhoun Point Comfort shall file the revised plan with the Secretary prior to construction.

THE FOLLOWING RECOMMENDED MEASURES APPLY TO CALHOUN LNG L.P.

16. For LNG facilities, the Director of OEP has delegated authority to take all steps necessary to ensure the protection of life, health, property, and the environment during construction and operation of the Project. This authority shall include:

    a. stop-work authority and authority to cease operation; and
    b. the design and implementation of any additional measures deemed necessary to assure continued compliance with the intent of the conditions of the Order.

17. As part of its environmental training, to be described in its Implementation Plan for review and written approval by the Director of OEP, Calhoun Point Comfort shall inform all construction and operation personnel that West Indian manatees may be present in the project area, and that personnel shall not feed or water a manatee if encountered; and if encountered the environmental inspector shall be informed immediately and the FWS contacted.

18. **Prior to accepting** ships greater than 140,000 m^3 in capacity, Calhoun Point Comfort shall provide the necessary information to demonstrate that the transient hazard areas identified in the EIS are applicable. Calhoun Point Comfort shall file this information with the Secretary for review and written approval of the Director of OEP. This information shall also be provided to the Coast Guard.

19. Calhoun Point Comfort shall, until commencement of construction, **annually** review its waterway suitability assessment relating to LNG vessel traffic for the project; update the assessment to reflect changing conditions which may impact the suitability of the waterway for LNG marine traffic; provide the updated assessment to the cognizant Captain of the Port/Federal Maritime Security Coordinator (COTP/FMSC) for review and validation and if appropriate, further action by the COTP/FMSC relating to LNG vessel traffic; and provide a copy to FERC staff.

The following measures shall apply to Calhoun LNG Terminal design and construction details. Information pertaining to these specific recommendations shall be filed with the Secretary for review and approval by the Director of OEP either: prior to initial site preparation; prior to construction of final design; prior to commissioning; or prior to commencement of service as indicated by each specific condition. Specific engineering,

vulnerability, or detailed design information meeting the criteria specified in Order No. 683 (Docket No. RM06-24-000), including security information, shall be submitted as critical energy infrastructure information (CEII) pursuant to 18 CFR 388.112. *See Critical Energy Infrastructure Information,* Order No. 683, 71 Fed. Reg. 58,273 (October 3, 2006), FERC Stats. & Regs. ¶ 31,228 (2006). Information pertaining to items such as: offsite emergency response; procedures for public notification and evacuation; and construction and operating reporting requirements would be subject to public disclosure. This information shall be submitted a minimum of 30 days before approval to proceed is required.

20. Complete plan drawings and a list of the hazard detection equipment shall be filed **prior to initial site preparation**. The list shall include the instrument tag number, type and location, alarm locations, and shutdown functions of the proposed hazard detection equipment. Plan drawings shall clearly show the location of all detection equipment.

21. Calhoun Point Comfort shall provide a technical review of its proposed facility design that:

    a. Identifies all combustion/ventilation air intake equipment and the distances to any possible hydrocarbon release (LNG, flammable refrigerants, flammable liquids and flammable gases); and

    b. Demonstrates that these areas are adequately covered by hazard detection devices and indicate how these devices would isolate or shutdown any combustion equipment whose continued operation could add to or sustain an emergency.

    Calhoun Point Comfort shall file this review **prior to initial site preparation**.

22. Complete plan drawings and a list of the fixed and wheeled dry-chemical, fire extinguishing, and high expansion foam hazard control equipment shall be filed **prior to initial site preparation**. The list shall include the equipment tag number, type, size, equipment covered, and automatic and manual remote signals initiating discharge of the units. Plan drawings shall clearly show the planned location of all fixed and wheeled extinguishers.

23. Facility plans showing the proposed location of, and area covered by, each monitor, hydrant, deluge system, hose, and sprinkler, as well as piping and instrumentation diagrams (P&IDs), of the fire water system shall be filed **prior to initial site preparation.**

24. A copy of the hazard design review and list of recommendations that are to be incorporated in the final facility design shall be filed **prior to initial site preparation**.

25. Drawings of the storage tank piping support structure and support of horizontal piping at grade shall be filed **prior to initial site preparation**.

26. The design pressure of the fractionation system shall be not less than the maximum shut off pressure from the low pressure LNG pumps, the same design pressure as the LNG/Gas exchangers, tube side of the process vaporizers and the LNG surge drum. The revised P&IDs and design information for the NGL fractionation system shall be submitted **prior to initial site preparation**.

27. Procedures shall be developed for offsite contractors' responsibilities, restrictions, limitations and supervision of these contractors by Calhoun Point Comfort staff, **prior to initial site preparation.**

28. Calhoun Point Comfort shall develop an Emergency Response Plan (including evacuation) and coordinate procedures with the Coast Guard, state, county, and local emergency planning groups, fire departments, state and local law enforcement, and appropriate Federal agencies. This plan shall include at a minimum:

    a. designated contacts with state and local emergency response agencies;
    b. scalable procedures for the prompt notification of appropriate local officials and emergency response agencies based on the level and severity of potential incidents;
    c. procedures for notifying residents and recreational users within areas of potential hazard;
    d. evacuation routes for residents and other public use areas that are within any transient hazard areas along the route of the LNG vessel transit;
    e. locations of permanent sirens and other warning devices; and
    f. an "emergency coordinator" on each LNG vessel to activate sirens and other warning devices.

    The Emergency Response Plan shall be filed with the Secretary for review and approval by the Director of OEP **prior to initial site preparation**. Calhoun Point Comfort shall notify FERC staff of all planning meetings in advance and shall report progress on the development of its Emergency Response Plan at **3-month** intervals.

29. The Emergency Response Plan shall include a Cost-Sharing Plan identifying the mechanisms for funding all project-specific security/emergency management costs that would be imposed on state and local agencies. In addition to the funding of direct transit-related security/emergency management costs, this comprehensive plan shall include funding mechanisms for the capital costs associated with any necessary security/emergency management equipment and personnel base. The Cost-Sharing Plan shall be filed with the Secretary for review and written approval by the Director of OEP **prior to initial site preparation.**

30. The **final design** shall provide LNG drain and LNG relief valve discharge piping to the LNG tank, to contain LNG within the storage system as the LNG containment design philosophy and minimize the discharge of liquid and cryogenic vapor to the cold vent system.

31. The **final design** shall include details of the pipe supports and restraints designed to prevent damage to piping systems and equipment in the event of a storm surge anticipated for a class 4 hurricane.

32. The **final design** of the hazard detection equipment shall identify manufacturer and model.

33. The **final design** of the fixed and wheeled dry-chemical, fire extinguishing, and high expansion foam hazard control equipment shall identify manufacturer and model.

34. The **final design** shall specify that unloading line check valves shall be located upstream of the block valve and adjacent to the manifold isolation valves as per note 15 of the P&ID.

35. The **final design** shall specify that check valves be installed in the LNG drain lines around the unloading arm shutdown valves (SDVs).

36. The **final design** shall specify that the unloading recycle line 4"-P-1031 shall be connected at the end of the unloading header.

37. The **final design** shall include provisions to install LNG transfer pumps at Jetty LNG sump, V-603.

38. The **final design** shall include detailed drawings of the spill control system to be applied to the LNG tank roof.

39. The **final design** shall include details of the LNG tank tilt settlement and differential settlement limits between each LNG tank and piping and procedures to be implemented in the event that limits are exceeded.

40. The **final design** shall include LNG tank fill flow measurement with high flow alarm for each tank.

41. The **final design** shall include details of the boil-off gas flow and temperature measurement provided for each tank.

42. The **final design** shall include check valves in the intank LNG pump discharge piping downstream of the minimum flow recycle connection.

43. The **final design** shall include LNG recycle from the recondenser to the LNG storage tank, designed to allow the vessel to be stabilized prior to LNG pump operation and recycle to storage for LP LNG pumps start up and testing.

44. The **final design** shall specify that the low pressure and high pressure LNG pump recycle lines to the storage tanks, P-2019 and P-2511, shall be the same pressure class as the LNG pump discharge piping including the final block valve to the tank.

45. The **final design** shall include provisions to recycle LNG from the suction header of the low pressure LNG pumps to storage.

46. The **final design** shall specify that the LNG surge drum, V-241, shall be equipped with weld-end connections for piping.

47. The **final design** shall minimize the use of flanged nozzles for connection of piping to high pressure vessels containing LNG and NGL.

48. The **final design** shall specify that 4"-P-2143 be connected to the 24" bottom outlet line, to eliminate the connection to the vessel and provide drainage for the 24" outlet and elbow.

49. The **final design** shall include provisions to recycle LNG from the suction header of the high pressure LNG pumps to storage.

50. The **final design** shall specify that relief valves in the discharge piping of the high pressure LNG pumps and sendout vaporizers be designed and set for the system design pressure, consistent with the maximum shutoff pressure of the LNG pumps.

51. The **final design** shall include dual low-low temperature alarm and shutdown at the discharge of the vaporizer.

52. The **final design** shall consider locating the vaporizer flow measurement device upstream of the vaporizer.

53. The **final design** shall specify that redundant pressure transmitters for high pressure alarm and shutdown shall be provided for the fractionation system and for protection of the pipeline.

54. The **final design** shall specify that all piping with service temperature at or below -20°F shall be stainless steel.

55. The **final design** shall specify that piping specifications shall state that spiral wound gaskets shall be of type CGI, to include both outer and inner retaining rings.

56. The **final design** shall specify that cryogenic piping and equipment shall be designed for cool down with liquid nitrogen.

57. The **final design** shall include P&IDs and drawings of the meter station.

58. The **final design** shall include a fire protection evaluation carried out in accordance with the requirements of NFPA 59A, chapter 9.1.2.

59. The **final design** shall include details of the shut down logic, including cause and effect matrices for alarms and shutdowns.

60. The **final design** shall include emergency shutdown of equipment and systems activated by hazard detection devices for flammable gas, fire, and cryogenic spills, when applicable.

61. The **final design** shall include details of the air gaps to be installed downstream of all seals or isolations installed at the interface between a flammable fluid system and an electrical conduit or wiring system. Each air gap shall vent to a safe location and be equipped with a leak detection device that shall: continuously monitor for the presence of a flammable fluid; alarm the hazardous condition; and shutdown the appropriate systems.

62. The **final design** shall include a HAZOP review of the completed design. A copy of the review and a list of the recommendations shall be filed with the Secretary

63. The P&IDs in the **final design** shall show and number all valves including drain, vent, main, and car sealed.

64. The **final design** shall include safeguards to be installed to protect above ground fire water piping, including post indicator valves, from inadvertent damage.

65. The **final design** shall specify that all hazard detection equipment shall include redundancy and fault detection and fault alarm monitoring in all potentially hazardous areas and enclosures.

66. All valves including drain, vent, main, and car sealed valves shall be tagged in the field during construction and **prior to commissioning.**

67. The design details and procedures to record and to prevent the tank fill rate from exceeding the maximum fill rate specified by the tank designer shall be filed **prior to commissioning**.

68. Plans and a tabulated list of the proposed hand-held fire extinguishers shall be filed **prior to commissioning.** The list and drawings shall identify the equipment number, type, size, number, and location.

69. Operation and Maintenance procedures and manuals, as well as safety procedure manuals, shall be filed **prior to commissioning.**

70. The contingency plan for failure of the LNG tank outer containment approved by the tank manufacturer shall be filed **prior to commissioning**.

71. A copy of the criteria for horizontal and rotational movement of the inner vessel for use during and after cool down shall be filed **prior to commissioning**.

72. The maintenance procedures to be filed **prior to commissioning** shall state that a foundation elevation survey of all LNG tanks shall be made on an annual basis.

73. **Prior to commissioning**, Calhoun Point Comfort shall coordinate, as needed, with the Coast Guard to define the responsibilities of Calhoun Point Comfort's security staff in supplementing other security personnel and in protecting the LNG tankers and terminal.

74. The FERC staff shall be notified of any proposed revisions to the security plan and physical security of the facility **prior to commencement of service.**

75. Progress on the construction of the LNG terminal shall be reported in **monthly** reports filed with the Secretary. Details shall include a summary of activities, projected schedule for completion, problems encountered and remedial actions taken. Problems of significant magnitude shall be reported to the FERC **within 24 hours**.

In addition, we recommend that the following measures shall apply throughout the life of the facility:

76. The facility shall be subject to regular FERC staff technical reviews and site inspections on at least an **annual** basis or more frequently as circumstances indicate. Prior to each FERC staff technical review and site inspection, the Calhoun Point Comfort shall respond to a specific data request including information relating to possible design and operating conditions that may have been imposed by other agencies or organizations. Up-to-date detailed P&IDs reflecting facility modifications and provision of other pertinent information not included in the semi-annual reports described below, including facility events that have taken place since the previously submitted annual report, shall be submitted.

77. **Semi-annual** operational reports shall be filed with the Secretary to identify changes in facility design and operating conditions, abnormal operating experiences, activities (including ship arrivals, quantity and composition of imported LNG, vaporization quantities, boil-off/flash gas, etc.), plant modifications including future plans and progress thereof. Abnormalities shall include, but not be limited to: unloading/shipping problems, potential hazardous conditions from offsite vessels, storage tank stratification or rollover, geysering, storage tank pressure excursions, cold spots on the storage tanks,

storage tank vibrations and/or vibrations in associated cryogenic piping, storage tank settlement, significant equipment or instrumentation malfunctions or failures, non-scheduled maintenance or repair (and reasons therefore), relative movement of storage tank inner vessels, vapor or liquid releases, fires involving natural gas and/or from other sources, negative pressure (vacuum) within a storage tank and higher than predicted boil-off rates. Adverse weather conditions and the effect on the facility also shall be reported. Reports shall be submitted **within 45 days** after each period ending **June 30 and December 31.** In addition to the above items, a section entitled "Significant plant modifications proposed for the next 12 months (dates)" also shall be included in the semi-annual operational reports. Such information would provide the FERC staff with early notice of anticipated future construction/maintenance projects at the LNG facility.

78. In the event the temperature of any region of any secondary containment, including imbedded pipe supports, becomes less than the minimum specified operating temperature for the material, the Commission shall be notified **within 24 hours** and procedures for corrective action shall be specified.

79. Significant non-scheduled events, including safety-related incidents (i.e., LNG or natural gas releases, fires, explosions, mechanical failures, unusual over pressurization, major injuries) and security related incidents (i.e., attempts to enter site, suspicious activities) shall be reported to FERC staff. In the event an abnormality is of significant magnitude to threaten public or employee safety, cause significant property damage, or interrupt service, notification shall be made **immediately**, without unduly interfering with any necessary or appropriate emergency repair, alarm, or other emergency procedure. In all instances, notification shall be made to FERC staff **within 24 hours**. This notification practice shall be incorporated into the LNG facility's emergency plan. Examples of reportable LNG-related incidents include:

    a. fire;
    b. explosion;
    c. estimated property damage of $50,000 or more;
    d. death or personal injury necessitating in-patient hospitalization;
    e. free flow of LNG that results in pooling;
    f. unintended movement or abnormal loading by environmental causes, such as an earthquake, landslide, or flood, that impairs the serviceability, structural integrity, or reliability of an LNG facility that contains, controls, or processes gas or LNG;
    g. any crack or other material defect that impairs the structural integrity or reliability of an LNG facility that contains, controls, or processes gas or LNG;
    h. any malfunction or operating error that causes the pressure of a pipeline or LNG facility that contains or processes gas or LNG to rise above its maximum allowable operating pressure (or working pressure for LNG facilities) plus the build-up allowed for operation of pressure limiting or control devices;
    i. a leak in an LNG facility that contains or processes gas or LNG that constitutes an emergency;
    j. inner tank leakage, ineffective insulation, or frost heave that impairs the structural integrity of an LNG storage tank;

k. any condition that could lead to a hazard and cause a 20 percent reduction in operating pressure or shutdown of operation of a pipeline or an LNG facility;

l. safety-related incidents to LNG vessels occurring at or en route to and from the LNG facility; or

m. an event that is significant in the judgment of the operator and/or management even though it did not meet the above criteria or the guidelines set forth in an LNG facility's incident management plan.

In the event of an incident, the Director of OEP has delegated authority to take whatever steps are necessary to ensure operational reliability and to protect human life, health, property or the environment, including authority to direct the LNG facility to cease operations. Following the initial company notification, FERC staff would determine the need for an on-site inspection by FERC staff; and the timing of an initial incident report (normally within 10 days) and follow-up reports.