

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF THE STAFF'S ENVIRONMENTAL ANALYSIS

The conclusions presented in this section are those of the environmental staff of the FERC, working in cooperation with the FWS, EPA, and COE. Review of the information provided by FGS and further developed from data requests; field visits; scoping; literature research; alternatives analysis; comments from federal, state, and local agencies; and input from individual members of the public indicates that development and operation of the proposed Floridian Natural Gas Storage Project would result in limited adverse environmental impacts. In addition, we conclude that if the proposed Project is constructed and operated in accordance with FGS' proposed mitigation and our additional mitigation recommendations presented in Section 5.2, it would be an environmentally acceptable action.

The discussion below summarizes the environmental impacts and mitigation we are recommending for each resource analyzed in this EIS.

5.1.1 Geology

Construction and operation of the Project would have minimal impact on geological resources. The Project is located in an area with no known extractive or surficial paleontological resources; low risk of soil liquefaction, slope failures, or landslides; and one of the lowest seismic hazards within the continental United States. Probabilistic and deterministic seismic hazard analyses determined the required input ground motions for design of the LNG storage facility. These were found to be consistent with the requirements of NFPA 59A and FERC's *Draft Seismic Design Guidelines and Data Submittal Requirements for LNG Facilities*. We are recommending that prior to construction, FGS provide additional geotechnical and structural design details for the LNG storage facility to support our review and approval of the final engineering design of the facility. No blasting is anticipated.

5.1.2 Soils

The Project would temporarily disturb 127.03 acres of land. None of this land or its soils are classified as prime farmland or considered to have high erosion potential by the U.S. Department of Agriculture; and none are currently in agricultural use. These soils, however, are generally very poorly to poorly drained, which contribute to their fair to very poor revegetation potential.

FGS would implement the mitigation measures contained in our Plan to control erosion, ensure successful revegetation, and minimize any potential adverse impacts to soil resources. FGS would further limit potential impacts to soil resources by implementing site-specific SPCC, SWPP, and Unanticipated Hazardous Waste Discovery plans. With the implementation of our Plan and FGS's site-specific plans, the Project would not result in any significant impacts to soils.

5.1.3 Water Resources

Project activities would not occur within 500 feet of any public water supply well and would not affect any sole-source aquifers or wellhead protection areas. The Project would withdraw a maximum of 30 gpm of groundwater for landscaping purposes, but this withdrawal rate would have a negligible impact on the surficial aquifer at the storage facility site. The SFWMD approved the Water Use Permit (No. 43-02115-W) for landscaping irrigation at the proposed facility on March 7, 2008. The greatest potential for impact to groundwater would be from spills, leaks, or other releases of hazardous materials during construction or operation. FGS has agreed to implement our Procedures as well as its own SPCC and SWPP plans to address this issue.

There are no major waterbodies in the Project area; the nearest major waterbody is the St. Lucie Canal, which is about two miles away. The pipeline would cross five waterbodies, which are all intermittent drainage ditches. FGS proposes to use open-cut methods to cross four ditches and would restore the ditches in accordance with our Procedures. FGS would also bore under one ditch from MP 0.99 to 1.02, avoiding impacts to 0.03 acre of wetlands.

FGS proposes to withdraw water from the St. Lucie Canal for hydrotesting of the LNG storage tanks and the pipeline (i.e., approximately 33.5 million gallons for tank testing and one million gallons for pipeline testing). FGS would use an existing irrigation intake structure, withdraw water at a rate that is less than 0.1 percent of the annual flow of the canal, not use any biocides or other water additives, and return the water to the canal after the testing is completed. The SFWMD approved the Water Use Permit (No. 43-02186-W) for hydrostatic testing of the LNG storage tanks on April 10, 2008. Therefore, we do not anticipate that the Project would have any significant adverse effects on water resources.

5.1.4 Wetlands

Construction of the Project would temporarily impact 3.91 acres of wetlands; there would be no permanent impacts. All of the wetland impacts would be associated with pipeline construction; no wetlands would be impacted by construction or operation of the LNG storage facility. None of the affected wetlands are forested, or considered high-quality, sensitive, or special status.

FGS minimized impacts to wetlands by evaluating route alternatives to avoid wetlands, reducing the nominal construction right-of-way width in wetlands to 65 feet, using a bore rather than open trenching to avoid impacting 0.03 acres of wetlands, and adopting our Procedures without modifications. Following construction, FGS would revegetate wetlands in accordance with our Procedures and COE permit conditions. The FDEP issued the ERP on March 19, 2008, which states the proposed wetland mitigation would improve on-site wetlands. By implementing these measures, effects on wetlands would be minimized.

5.1.5 Vegetation

In addition to the wetland vegetation resources described above, Project construction would clear 123.12 acres of upland cover types. Project operations would permanently affect 53.10 acres for the LNG storage facility; and 25.30 acres for the permanent pipeline right-of-way, M&R station, and pipeline interconnections. Much of this land is previously disturbed and is dominated by invasive species such as Australian pine and Brazilian pepper. Further, the LNG storage facility site was previously contaminated and is currently undergoing EPA-supervised remediation.

FGS would implement our Plan to facilitate the revegetation of disturbed areas not used for aboveground facilities. In addition, FGS prepared a PAMP for the LNG storage facility site that identifies the location of Preserve Areas, invasive species controls, construction procedures, and monitoring requirements. To ensure appropriate application of herbicides, we are recommending that FGS develop a Standard Operating Procedure for Herbicide Use that meets EPA requirement. Given these measures, impacts to upland vegetation would be effectively minimized.

5.1.6 Wildlife and Aquatic Resources

The upland and wetland vegetative communities in the Project area support habitats for a variety of wildlife species. As indicated above, the Project would result in the clearing of 127.03 acres of land and the permanent loss of 56.07 acres of wildlife habitat (53.10 acres for the LNG storage facility and 2.97 acres for the M&R station and interconnections). In addition, 2.48 acres of upland habitat would become part of the stormwater pond. Much of this affected land, however, was previously disturbed and contaminated and does not represent valuable habitat. During construction, more mobile species would be temporarily displaced to similar habitats nearby, while less mobile species may suffer direct mortality or permanent displacement. Regardless of mobility, some wildlife species would be affected by the loss of cover, nesting, and foraging habitat. Once construction is complete and work areas restored, wildlife could re-occupy available habitat. Pipeline construction and right-of-way maintenance can also fragment wildlife habitat reducing its value, but in this case the pipeline follows an existing electric transmission line right-of-way for much of its length. Therefore, wildlife would not be significantly impacted by the Project.

The Project would not affect any naturally occurring waterbodies, including any major, navigable, or sensitive waterbodies. Drainage ditches crossed by the pipeline contain only common forage fishes such as mosquito fish, least killifish, and small sunfish. The ditches are not considered critical habitat by FWS for any native or game fish species and do not provide habitat for recreationally important fish species. The on-site stormwater pond does not provide significant aquatic habitat, therefore, expansion of the stormwater pond would not adversely affect aquatic resources at the LNG storage facility site. FGS proposes to construct the Project in accordance with our Procedures, ensuring that the physical characteristics of the drainage ditches that may provide aquatic habitat are restored to pre-Project conditions. Therefore, we conclude that the Project would not have any significant adverse effects on aquatic resources.

5.1.7 Threatened, Endangered, and Special Status Species

Four federally-listed endangered or threatened species may occur in the Project area. Based on our review of FWS species accounts and field survey information provided by FGS, we have determined that the Project would have no effect on the Audubon crested caracara. We have also determined that the Project is not likely to adversely affect the wood stork, the American alligator, or the Eastern indigo snake.

The wood stork is highly mobile and not dependent upon the industrial land use at the LNG storage facility site. It does not use the storage facility site or proposed pipeline corridor for nesting, and large areas of suitable foraging habitat are available in the vicinity. The Project is designed to avoid forested wetland areas and any impacts to emergent and scrub-shrub wetlands and vegetated ditches along the pipeline corridor that the wood stork uses for foraging would be temporary. All areas would be restored. No loss of potential foraging habitat for the wood stork would occur.

At the LNG storage facility site, a single alligator was observed in one of the ponds and other individuals may inhabit other open water habitats and wetlands in the vicinity of the site. FGS proposes to expand one of the ponds on-site to provide increased stormwater management capacity. Temporary construction impacts to the American alligator are likely to be minor and of short duration. During the expansion of the stormwater pond, it is likely that individual alligators that may be in the pond would temporarily relocate to adjacent ponds on-site. Expansion of the stormwater pond would ultimately provide additional suitable habitat.

Although no Eastern indigo snakes were observed on the LNG storage facility site or along the pipeline corridor, FGS surveys identified several gopher tortoise burrows on the proposed storage facility site. Gopher tortoise burrows are commonly used by the Eastern indigo snake. FGS would obtain a pre-clearing gopher tortoise relocation permit from the FFWCC to excavate any burrows within 25 feet of construction areas prior to initiation of construction. Any Eastern indigo snakes captured during gopher tortoise relocation efforts would also be relocated to an approved on-site or off-site location in consultation with FFWCC and FWS representatives. In addition to these measures, FGS has agreed to implement the FWS *Standard Protection Measures for the Eastern Indigo Snake*.

We have been informally consulting with the FWS, which is a cooperating agency in the preparation of this EIS, regarding Project effects on these listed species. In a letter dated June 2, 2008, the FWS concurred with the findings of the EIS that the Project would not affect or would not likely adversely affect any federally-listed species. In a letter dated June 27, 2008, the FWS also concurred that the Project would have no effect on listed species at the Tampa Farms construction staging area. Consequently, the Commission's required consultation under Section 7 of the Endangered Species Act is complete.

Six state-listed species may also be found at the Project. Nine active gopher tortoise burrows were observed at the LNG storage facility site. FGS has proposed measures to capture the tortoises during construction and relocate them to an on-site preserve. Five state-listed birds are also found in the Project area, but suitable habitat does not exist at the Project for nesting. Foraging habitats would only be temporarily affected by

construction and would be immediately restored. Therefore, we conclude that the Project would not have any significant adverse effect on state-listed species. In an e-mail dated June 14, 2007, the FFWCC stated they had no official comment on the Project but did not find any substantive issues with the Project and believe the impacts to state-listed species should be negligible.

5.1.8 Land Use, Recreation, and Visual Resources

Project construction would require 55.58 acres for the LNG storage facility and 71.45 acres for the construction right-of-way, construction staging area, the M&R station, and pipeline interconnections. Project operations would require 53.10 acres for the LNG storage facility and 25.30 acres for the permanent 50-foot-wide pipeline right-of-way, the M&R station, and pipeline interconnections. The Project would be consistent with current zoning and future land use plans by Martin County and compatible with surrounding land uses, which are principally industrial or agri-business in nature (e.g., Cogentrix power plant, Louis Dreyfus citrus processing plant, Tampa Farms wholesale egg facility).

The Project would have no effect on recreation resources or special interest areas. No residences are located within 0.6 mile of the pipeline right-of-way. There are three residences within 0.50 mile of the LNG storage facility, with the nearest residence located approximately 0.46 mile away. Although the storage tanks would be visible to the surrounding area, the storage facility site has an established industrial character and is adjacent to other industrial uses. As a result, the visual changes resulting from tank construction and operation would be visually consistent with the character of the area.

The FDEP approved the ERP permit for the Project on March 19, 2008, which included the federal coastal zone consistency determination; therefore, the Project is consistent with the federal CZMA.

5.1.9 Socioeconomics

Construction of the Project would not have a significant adverse impact on local population, housing, employment, community services, or local commerce. Any adverse impacts would be highly localized and temporary. Project construction would temporarily increase demand for housing and public services such as medical and law enforcement, but these effects would be temporary and limited to the construction period. During Project operation, the LNG storage facility would have self-contained safety, fire, and security resources and would not require these services from the community. Pursuant to DOT regulations, FGS would coordinate with local emergency responders regarding pipeline facilities and public safety. In addition, facility operation would only require 32 permanent staff, which would present a negligible increase in the demand for housing and public services.

The Project would have a beneficial effect on government tax revenues. In addition to fees paid to the Martin County Building Department by FGS during construction, local spending by construction employees and the Project would increase sales tax revenues locally. During operation, FGS would pay a minimum of \$1.6 million annually in

property taxes to the county as well as corporate income tax (5.5 percent annually) to the State. Annual payroll during operations is estimated at \$2.2 million per year.

No residences are located within 0.6 mile of the proposed pipeline construction work areas. There are three residences within 0.50 mile of the LNG storage facility, with the nearest residence located approximately 0.46 mile away. The proposed storage facility and pipeline corridor avoid populated areas, minimizing the number of persons at risk of injury due to an accident at the storage facility or a pipeline failure. Although the proposed storage facility would emit some air emissions during normal Project operation, these emissions would be minor, below PSD applicability thresholds, and not a public health hazard. The potential health risk from Project operations would be extremely small, while potential economic benefits would be substantial. Although the racial and economic composition of the Indiantown Census County Division does not appear to meet the EPA definition of a minority or low-income community, the Project is proximate to the Indiantown CDP, which does have a minority population that is meaningfully higher than the general area. There is no evidence, however, that the proposed Project would have any significantly higher or adverse environmental or human health effects and would not result in any environmental justice issues.

5.1.10 Transportation

Project construction would occur over 36 months and involve a peak of approximately 450 workers. FGS proposes to mitigate any temporary traffic problems by scheduling shifts and truck deliveries for off-peak hours, providing temporary traffic lights, and using off-duty representatives of the Martin County Sheriff's Department to avoid any congestion. No construction would occur on public roads and no road closures or detours are planned.

The Project expects to have up to 33 full-time employees. The traffic generated by this number of employees would be minor compared to average daily traffic on SR 710 (i.e., 7,800 vehicles per day). Therefore, we conclude that the Project would not have any significant adverse effect on transportation or traffic conditions in the Project area.

5.1.11 Cultural Resources

FGS conducted cultural resource surveys on the LNG storage facility site and pipeline corridor, as well as at the proposed M&R station site, access roads, and temporary workspaces. No archaeological sites were identified within the Project area. In addition, a survey was completed of historic properties in the surrounding area, which did not identify any sites as eligible for listing in the National Register of Historic Places. The Cultural Resource Assessment Survey Reports for the Project and Tampa Farms construction staging area were reviewed by the Florida Division of Historical Resources, which concurred with the findings of the reports and agreed that no further investigation is necessary. FGS contacted five Native American groups regarding the Project. FGS also held informal conversations with both the Seminole THPO and Miccosukee Section 106 representative, both of whom concurred with the findings of the cultural resource studies.

5.1.12 Air Quality and Noise

Air quality impacts associated with construction of the Project would include emissions from construction equipment and fugitive dust. Such air quality impacts, however, would be temporary and localized and would not cause or contribute to a violation of applicable air quality standards. The proposed LNG storage facility would emit air pollutants as a result of operation. Project emissions would be minimized through the use of low NO_x burners for the WEG heaters; use of clean-burning natural gas fuels; and appropriate operation and maintenance procedures. In addition, the facility would be operated in compliance with federal and state air quality regulations driven by the CAA. The Project would not be subject to Prevention of Significant Deterioration permitting and would not exceed NAAQS thresholds. Since Martin County is classified as an attainment area for all criteria pollutants, a General Conformity review of the Project is not required. Therefore, we conclude that the Project would not have a significant adverse effect on air quality.

Noise would be generated during construction of the pipelines and during construction and operation of the LNG storage facility. Impacts to noise quality associated with construction would generally be temporary, minor, and limited mostly to daylight hours. The proposed storage facility would generate noise on a continuous basis during operation, but potential noise-related impacts would be limited to the vicinity of the facility and modeling indicates that facility noise would be below 55 dBA at NSAs. In addition, we are recommending that FGS complete post-construction noise surveys and implement additional mitigation measures, if required, to ensure that actual noise levels resulting from Project operations would not exceed 55 dBA. Therefore, we conclude that the Project would not have a significant adverse effect on noise in the Project area.

5.1.13 Reliability and Safety

Our evaluation of the front-end-engineering design of the proposed LNG storage facility included a review of the cryogenic safety; thermodynamics; heat transfer, instrumentation; cryogenic processes; and other relevant safety systems. As a result of the technical review of the proposed design of the LNG storage facility, we have identified a number of concerns relating to the reliability, operability, and safety of the proposed design and are making recommendations to address these issues. Compliance with these recommendations would need to be demonstrated by FGS prior to initial site preparation, prior to construction, after final design, prior to commissioning, or prior to commencement of service. Therefore, we believe that appropriate features and modifications would be incorporated into the facility design to enhance the safety and operability of the proposed LNG storage facility. In addition, we believe that the proposed facility complies with the siting requirements of Title 49, CFR, Part 193.

FGS would comply with DOT's pipeline material and construction standards for natural gas pipelines. After construction, FGS must implement a pipeline integrity management plan to ensure public safety during operation of the pipeline.

5.1.14 Alternatives

This EIS addresses alternatives to the proposed action. The FERC can deny the Project, postpone the issuance of a Certificate pending further study, or issue a Certificate for the Project as proposed or modified by location or condition.

No Action or Postponed Action Alternatives

The No Action or Postponed Action Alternatives would deny or defer the Project. While these alternatives would avoid the environmental impacts identified in this EIS, the objectives of the Project would not be met and customers and other markets in Florida would be denied the flexible and reliable gas supply that could be provided by the Project. This in turn could lead to higher natural gas prices, the use of alternative sources of energy, or 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 need for additional gas supplies. Therefore, we conclude that the No Action and Postponed Action Alternatives are not preferable to the proposed action.

System Alternatives

Our analysis of system alternatives included an evaluation of alternative LNG storage facilities (e.g., underground storage), other planned or proposed LNG terminal projects, and pipeline expansions. Due to the geology in the state, very few suitable underground storage caverns exist within Florida and none are located in the southern part of the state. As a result, the typical underground storage options are not viable system alternatives to the proposed action.

Four LNG import terminals have been proposed near to, but outside of, Florida and are in varying stages of development. Two terminals have been proposed as onshore import terminals in the Bahamas, but neither of these have yet been approved by the Bahamian government. The other two terminals are deepwater port proposals subject to review by the USCG and approval by the Maritime Administration. Our analysis determined that these projects are not viable alternatives to the proposed Project because the four LNG import terminals cannot be in service within the needed timeframe; or cannot perform storage and peaking service.

The proposed Project is not an energy source itself, but is needed to improve current electrical generating system reliability. To the extent that this Project could make gas fired generating facilities more attractive because of improved reliability, we discussed the status of alternative energy sources and energy conservation in Florida. The Florida Public Services Commission concluded that energy demand forecasts continue to surpass current energy conservation and renewable energy programs offered by Florida's utilities and that local utilities should continue investigating natural gas supply and delivery options such as natural gas storage to maintain diversity in the face of unplanned supply or distribution disruptions.

Expansion, looping, and added compression to existing pipelines were also considered. Pipeline system expansions, consisting of the construction of large-diameter pipelines,

looping of constrained portions of the pipelines, or additional compression would not provide needed storage capacity nor satisfy the Project objective of having supply available in Florida to serve the region during peak demand periods and weather related shut-ins when pipeline deliveries are curtailed or disrupted, and are not considered a viable alternative to the proposed Project.

Site and Route Alternatives

In addition to system alternatives, we evaluated six alternative LNG storage facility sites in south Florida and three alternative pipeline corridors. Our evaluation of sites considered zoning and land use compatibility, wetlands avoidance, proximity to interstate natural gas pipelines, suitability for proposed use, and proximity to the market area. None of the alternative storage facility sites we evaluated are considered to be environmentally preferable to the proposed storage facility site. None of the alternative pipeline routes offered any environmental advantages to the proposed route.

In summary, we have determined that the proposed Project, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Project purpose.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission issues a Certificate for the proposed Project, we are recommending that the Commission's Order include the following specific conditions. We believe that these measures would further mitigate the environmental impacts associated with the construction and operation of the proposed Project.

1. FGS 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. FGS 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. For the LNG facility, 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.
4. **Prior to any construction**, FGS 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.
5. The authorized facility locations shall be as shown in the EIS, as supplemented by filed alignment sheets. **As soon as they are available, and before the start of construction**, FGS 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.

FGS' exercise of eminent domain authority granted under Natural Gas Act section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. FGS' right of eminent domain granted under Natural Gas Act section 7(h) does not authorize it to increase the size of its natural gas pipeline to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.
6. FGS 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 will 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 will 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 our 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.
7. **At least 60 days before the start of construction**, FGS shall file an initial Implementation Plan with the Secretary for review and written approval by the Director of OEP describing how FGS will implement the mitigation measures required by the Order. FGS must file revisions to the plan as schedules change. The plan shall identify:
- a. how FGS 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, 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 FGS 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 specific portion of FGS' organization having responsibility for compliance;
 - f. the procedures (including use of contract penalties) FGS will follow if noncompliance occurs; and
 - g. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:
 - i. the completion of all required surveys and reports;
 - ii. the mitigation training of on-site personnel;
 - iii. the start of construction; and

- iv. the start and completion of restoration.
8. FGS shall employ at least one environmental inspector. The environmental inspector 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 7 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.
9. FGS shall file updated status reports prepared by the environmental inspector with the Secretary on a bi-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 inspector 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 FGS from other federal, state or local permitting agencies concerning instances of noncompliance, and FGS' response.

10. FGS must receive written authorization from the Director of OEP **before commencing service** from the Project. Such authorization will only be granted following a determination that the LNG facility has been constructed in accordance with Commission approval and applicable standards, can be expected to operate safely as designed, and the rehabilitation and restoration of the right-of-way is proceeding satisfactorily.
11. **Within 30 days of placing the certificated facilities in service**, FGS shall file an affirmative statement with the Secretary, certified by a senior company official:
 - a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
 - b. identifying which of the certificate conditions FGS 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. FGS shall develop a Standard Operating Procedure for Herbicide Use that meets EPA requirements. (*Section 4.4.2*)
13. FGS shall make all reasonable efforts to assure its predicted noise levels from the LNG storage facility are not exceeded at nearby NSAs and file noise surveys showing this with the Secretary **no later than 60 days** after placing the LNG storage facility in service. However, if the noise attributable to the operation of the LNG storage facility at full load exceeds an L_{dn} of 55 dBA at any nearby NSAs, FGS shall file a report on what changes are needed and shall install additional noise control to meet the level **within one year** of the in-service date. FGS shall confirm compliance with this requirement by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls. (*Section 4.11.2*)

Recommendations 14 through 23 shall apply to the Project design and construction details. All detailed design documents (drawings, calculations, specifications, etc.) and design submittals shall satisfy the requirements of Section 4, Part II of the FERC's Draft Seismic Design Guidelines and Data Submittal Requirements for LNG Facilities, January 2007 (draft Seismic Design Guidelines). The following information shall be filed with the Secretary for review and approval by the Director of OEP either prior to the issuing of requests for quotations; prior to construction; or prior to commissioning as indicated by each specific condition.

14. File a detailed plan, including calculations, for the LNG tank foundation surcharge, **prior to construction**. (*Section 4.1.4*)
15. File a list of all structures, systems, and components that are assigned Seismic Category I **prior to construction** for review as described in section 3.6 of Part II of the FERC Seismic Guidelines. (*Section 4.1.4*)

16. Seismic Design Criteria shall be provided for all Seismic Design Category I structures, systems, and components as described in section 3.7 of Part II of the FERC Seismic Guidelines **prior to construction**. The Seismic Design Criteria shall satisfy Part I of the FERC Seismic Guidelines. (*Section 4.1.4*)
17. LNG Tank and Foundation Design shall comply with Part I of the FERC Seismic Guidelines. Submittals that demonstrate compliance shall be provided **prior to construction**. (*Section 4.1.4*)
18. Final foundation design recommendations for all other Seismic Category I structures shall be submitted for review and approval **prior to construction**. (*Section 4.1.4*)
19. All items identified in the submitted geotechnical/seismic reports which were proposed to be addressed during the detailed design shall be submitted for review and approval **prior to construction**. (*Section 4.1.4*)
20. Seismic specifications to be used in conjunction with the procuring equipment as described in section 3.10 of Part II of the FERC Seismic Guidelines shall be submitted for review **prior to the issuing of requests for quotations**. (*Section 4.1.4*)
21. Quality Control and Assurance procedures as described in section 3.11 of Part II of the FERC Seismic Guidelines that will be used for design and construction shall be submitted for review **prior to construction** of the project. (*Section 4.1.4*)
22. A seismic instrumentation plan as described in section 3.12 of Part II of the FERC Seismic Guidelines shall be provided **prior to commissioning**. (*Section 4.1.4*)
23. The results of the hydrostatic load tests on the LNG storage tanks, including settlement data as described in section 7.4.1 of the FERC Seismic Guidelines shall be provided **prior to commissioning**. (*Section 4.1.4*)

Recommendations 24 through 91 shall apply to the FGS 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.

24. 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. (*Section 4.12.2*)

25. FGS 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);
 - 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.

FGS shall file this review **prior to initial site preparation.** (*Section 4.12.2*)

26. Complete plan drawings and a list of the fixed and wheeled dry-chemical, fire extinguishing, and other 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. (*Section 4.12.2*)
27. Facility plan drawings showing the proposed location of, and area covered by, each monitor, hydrant, deluge system, hose, and sprinkler, as well as piping and instrumentation diagrams of the fire water system, shall be filed **prior to initial site preparation.** (*Section 4.12.2*)
28. FGS shall perform a hazard design review, which addresses operability, reliability, and safety, of the updated intermediate process and instrumentation diagrams (P&IDs). A copy of the hazard design review, the list of recommendations that are to be incorporated in the final facility design, and the updated intermediate P&IDs shall be filed **prior to initial site preparation.** (*Section 4.12.2*)
29. Drawings of the storage tank piping support structure and support of horizontal piping at grade shall be filed **prior to initial site preparation.** (*Section 4.12.2*)
30. Procedures shall be developed for offsite contractors' responsibilities, restrictions, limitations and supervision of these contractors by FGS staff, **prior to initial site preparation.** (*Section 4.12.2*)
31. FGS shall file step-by-step calculations showing how the vapor production rate from a single trench element over a 10 minute period was determined, **prior to initial site preparation.** (*Section 4.12.3*)
32. FGS shall file revised vapor dispersion simulations with the following information, **prior to initial site preparation:**

- a. a quantitative grid sensitivity analysis that supports the selection of grid size and demonstrates the convergence of the downwind dispersion distances;
 - b. simulations with mirror boundary conditions for the side and top boundaries;
 - c. simulations that allow the wind profile to reach a steady or quasi-steady state before injecting LNG vapor into the domain;
 - d. a sensitivity analysis and technical justification that supports the slip factor value used to determine the downwind dispersion distances;
 - e. an evaluation of the effect that the “reaction flag” in the source code to FDS has on the downwind dispersion distances;
 - f. technical justification and/or sensitivity analyses that support the selection of the lapse rate, ground surface material properties, temperature, humidity, and wind profile used to determine the downwind dispersion distances; and
 - g. all pertinent input files (*.fds) and output files (*.out) used to determine the downwind dispersion distances. (*Section 4.12.3*)
33. FGS shall provide information/revisions related to the 39 responses to the January 17, 2008 Engineering Information Request which stated that corrections, or modifications would be made to the design. The **final design** shall specifically address response numbers 4, 6, 7, 11, 17, 18, 21, 22, 24, 27, 28, 29, 30, 33, 35, 36, 37, 38, 41, 42, 43, 49, 55, 58, 60, 61, 62, 63, 65, 67, 73, 76, 77, 78, 80, 83, 91, 94, and 99 using management of change procedures. (*Section 4.12.2*)
34. The **final design** shall clearly and consistently show the design of the process systems on both the process flow diagrams (PFDs) and P&IDs. (*Section 4.12.2*)
35. The P&IDs in the **final design** shall show and number all valves including drain, vent, main, and car sealed. (*Section 4.12.2*)
36. The **final design** shall specify that the set pressure of PAH-11055 shall not be greater than 50 psig below the design pressure of the system. (*Section 4.12.2*)
37. The **final design** shall include layout provisions for the installation of an adsorber feed gas cooler and chiller system. (*Section 4.12.2*)
38. In the event that ceramic support material is used to retain the molecular sieve, the **final design** shall include a witch hat type strainer at the bottom outlet of each adsorber, designed to retain support material. (*Section 4.12.2*)
39. The **final design** shall include a shutoff valve at the inlet to the NGL extraction exchanger. This valve may be the proposed manual isolation valve equipped with an actuator operated by the Safety Instrumentation System (SIS). (*Section 4.12.2*)
40. The **final design** shall include an isolation valve downstream of the ethylene pressure regulator. (*Section 4.12.2*)

41. The **final design** shall include a hazard and operability review of the completed design. A copy of the review and a list of the recommendations shall be filed with the Secretary. (*Section 4.12.2*)
42. The **final design** shall specify that the LNG tank carbon steel piping support plates and connections to piping supports shall be designed to ensure that corrosion protection is adequately provided and provisions for corrosion monitoring and maintenance of carbon steel attachments are to be included in the design and maintenance procedures. (*Section 4.12.2*)
43. The **final design** of the tank foundation shall include an inclinometer, instrumented to record and display tank settlement, with a minimum of eight permanent reference points equally spaced round the base for elevation survey measurement. (*Section 4.12.2*)
44. 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 would be exceeded. (*Section 4.12.2*)
45. The **final design** shall include detailed drawings of the spill control system to be applied to the LNG tank roof. (*Section 4.12.2*)
46. The **final design** shall provide a discretionary vent for each LNG tank that can relieve the tank pressure when the tank is isolated from the boiloff vapor system. (*Section 4.12.2*)
47. The **final design** shall include a recycle line from the top of the sendout pump suction header to storage. (*Section 4.12.2*)
48. The **final design** shall specify that the first isolation valve at the inlet to the sendout pumps would be a weld end shutoff valve. In the case that flanged valves would be specified, the sendout system should be shutdown in the event of a leak. (*Section 4.12.2*)
49. The **final design** shall provide a minimum flow recycle line from the sendout pumps to the LNG storage tanks. The piping including the isolation valve upstream of the discharge to the storage tanks shall be the same pressure and temperature rating as the piping at the discharge of the sendout pumps. (*Section 4.12.2*)
50. The **final design** shall include provisions to drain and purge the LNG inlet piping to the vaporizer to a safe location. (*Section 4.12.2*)
51. The **final design** shall specify that the LNG isolation valve from the inlet header to the vaporizer is to be a weld end shutoff valve operated by the SIS. In the case that flanged valves would be specified, the sendout system should be shutdown in the event of a leak. (*Section 4.12.2*)
52. The **final design** shall specify the vaporizer discharge valve to the outlet header to be a weld end shutoff valve operated by the SIS. In the case that flanged valves would be specified, the sendout system should be shutdown in the event of a leak. (*Section 4.12.2*)

53. The **final design** shall specify that the shell side of the LNG vaporizer is to be equipped with a full flow bursting disc sized for tube failure. (*Section 4.12.2*)
54. The **final design** shall include provisions to transmit the flow measurement of the WEG solution to each LNG vaporizer to the distributed control system (DCS). (*Section 4.12.2*)
55. The **final design** shall include provisions to limit the LNG flow to the effective vaporization capacity of the circulating WEG at any time. (*Section 4.12.2*)
56. The **final design** shall include a pilot relief valve, or operated vent valve, sized for thermal relief and located at the discharge of each vaporizer upstream of the isolation valves. (*Section 4.12.2*)
57. The **final design** shall include shutoff valves operated by the SIS at the suction and discharge of the boiloff, tail gas, and NGL compressors. (*Section 4.12.2*)
58. The **final design** shall specify that manual bypass valves shall be car sealed closed. (*Section 4.12.2*)
59. The **final design** shall specify that all drains from LNG and refrigerant systems are to be equipped with double isolation and bleed valves. (*Section 4.12.2*)
60. The **final design** shall specify that, for LNG and natural gas service, branch piping and piping nipples less than 50mm (2 inches), are to be no less than schedule 160. (*Section 4.12.2*)
61. The **final design** shall include provisions to flare cryogenic and heavy hydrocarbon vapors currently shown as being discharged to atmosphere through the vent stack. (*Section 4.12.2*)
62. The **final design** shall specify that the vent/flare stack separator vessel shall be equipped with low level alarm, high level alarm and high-high level alarm. (*Section 4.12.2*)
63. The **final design** shall specify that in the event that high-high level occurs in vent/flare stack separator vessel, the facility shall be shut down until the liquid has been removed to below the low level alarm limit. (*Section 4.12.2*)
64. The **final design** shall provide P&IDs, specifications and procedures that clearly show and specify the tie-in details required to safely connect the Phase 2 expansion. (*Section 4.12.2*)
65. Layout and elevation drawings of the process equipment that are appropriate for the proposed operation and maintenance of the facility shall be included in the **final design** and submitted to the FERC at the time that the EPC contractor issues the drawing for review. This milestone shall be included in the project schedule. (*Section 4.12.2*)
66. The **final design** shall specify that the hazardous area classification of the areas containing liquefaction exchangers, LNG pumps, LNG vessels, and inlet and outlet of LNG vaporizers would be as Class 1, Group D, Division 1. (*Section 4.12.2*)

67. The **final design** shall include details of the air gaps to be installed downstream of all seals or isolations that are located 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; shall alarm the hazardous condition; and shall shutdown the appropriate systems. (*Section 4.12.2*)
68. The **final design** shall include audible and visual warning at buildings with instrument air service when nitrogen is supplied to the instrument air system. (*Section 4.12.2*)
69. The **final design** shall provide automatic shutoff of the fuel gas to the fuel gas heaters, upstream of the pressure regulators. (*Section 4.12.2*)
70. The **final design** shall include detection of flammable gas from the shell side vent of the LNG vaporizer and in the WEG system. Alarm and shutdown of equipment shall be provided as appropriate. (*Section 4.12.2*)
71. The **final design** of the hazard detection equipment shall identify manufacturer and model. (*Section 4.12.2*)
72. The **final design** shall specify that all hazard detection equipment shall include redundancy fault detection and fault alarm monitoring in all potentially hazardous areas and enclosures. (*Section 4.12.2*)
73. The **final design** of the fixed and wheeled dry-chemical, fire extinguishing and high expansion foam hazard control equipment shall identify the manufacturer and model. (*Section 4.12.2*)
74. The **final design** shall include an updated fire protection evaluation in accordance with the requirements of NFPA 59A 2001, chapter 9.1.2. (*Section 4.12.2*)
75. The **final design** shall specify that multiple cameras shall be installed to monitor the entry/exit gate and approach to the facility entrance. (*Section 4.12.2*)
76. The **final design** of the firewater system shall include provisions to measure and record the discharge flow and pressure from each of the firewater pumps. (*Section 4.12.2*)
77. The **final design** shall include an uninstalled spare firewater jockey pump. (*Section 4.12.2*)
78. The **final design** shall include details of the shut down logic, including cause and effect matrices for alarms and shutdowns. (*Section 4.12.2*)
79. The **final design** shall specify that all ESD valves are to be equipped with open and closed position switches connected to the DCS/SIS. (*Section 4.12.2*)
80. 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. (*Section 4.12.2*)

81. The **final design** shall include drawings, P&IDs, and specifications for the mounding system and the coatings and cathodic protection system for the vessels. *(Section 4.12.3)*
82. 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. *(Section 4.12.2)*
83. All valves including drain, vent, main, and car sealed, or locked valves shall be tagged in the field during construction and **prior to commissioning**. *(Section 4.12.2)*
84. The car seal procedure and car seal control logs for all valves shall be provided **prior to commissioning**. *(Section 4.12.2)*
85. A tabulated list of the proposed hand-held fire extinguishers shall be filed **prior to commissioning**. The information shall include a list with the equipment number, type, size, number, and location. Plan drawings shall include the type, size, and number of all hand-held fire extinguishers. *(Section 4.12.2)*
86. Operation and Maintenance procedures and manuals, as well as emergency response plans and safety procedures, shall be filed **prior to commissioning**. *(Section 4.12.2)*
87. The Operations and Maintenance procedures to be provided **prior to commissioning**, shall state that filters are not to be opened unless the unit can be completely depressurized when isolated. *(Section 4.12.2)*
88. The contingency plan for failure of the LNG tank outer containment shall be filed **prior to commissioning**. *(Section 4.12.2)*
89. A copy of the criteria for horizontal and rotational movement of the inner tank for use during and after cool down shall be filed **prior to commissioning**. *(Section 4.12.2)*
90. 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**. *(Section 4.12.2)*
91. Progress on construction of the project 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**. *(Section 4.12.2)*

In addition, recommendations 92 through 97 shall apply throughout the life of the facility:

92. The facility shall be subject to regular FERC staff technical reviews and site inspections on at least a **biennial basis** or more frequently as circumstances indicate. Prior to each FERC staff technical review and site inspection, FGS 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 piping and instrumentation diagrams 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. (*Section 4.12.2*)
93. **Semi-annual** operational reports shall be filed with the Secretary to identify changes in facility design and operating conditions, abnormal operating experiences, activities (including trucking, quantity and composition of feed gas and trucked LNG, vaporization quantities, boil-off/flash gas, etc.), plant modifications including future plans and progress thereof. Abnormalities shall include, but not be limited to: trucking problems, 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 boiloff 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. (*Section 4.12.2*)
94. FGS shall include completed car seal control logs with the first two **Semi-annual** operational reports filed with the Commission. (*Section 4.12.2*)
95. In the event the temperature of any region of any secondary containment 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. (*Section 4.12.2*)
96. FGS shall develop a traffic control plan coordinated with local authorities to address LNG and NGL truck transportation from the facility. This plan shall be incorporated into the facility's operation and maintenance procedures and manuals **prior to any trucking activities** at the LNG facility. (*Section 4.12.4*)
97. Significant non-scheduled events, including safety-related incidents (i.e., LNG or natural gas releases, fires, explosions, mechanical failures, unusual over pressurization, and 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 the Commission **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 with LNG and NGL trucks 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, the Commission staff would determine the need for an on-site inspection by Commission staff, and the timing of an initial incident report (**normally within 10 days**) and follow-up reports. (*Section 4.12.2*)