

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF THE STAFF'S ENVIRONMENTAL ANALYSIS

We have determined that construction and operation of the Cheniere Corpus Christi LNG Project would result in limited and mostly insignificant environmental impacts. If the Project is found to be required by the public convenience and necessity and is constructed and operated in accordance with Cheniere's proposed mitigation and our recommended mitigation measures, it would be an environmentally acceptable action. Our conclusion is based on information provided by Cheniere and data developed from data requests; field investigations by the Commission staff; literature research; alternatives analysis; comments from federal, state, and local agencies; and input from public groups and individual citizens.

As part of our review, we developed measures that we believe would appropriately and reasonably avoid, minimize, or mitigate for environmental impacts resulting from construction and operation of the proposed Project. We are, therefore, recommending that our mitigation measures be attached as conditions to any authorization issued by the Commission.

5.1.1 Geology

Construction and operation of the Project would have minimal impact on geological resources. Four plugged and abandoned wells are located within the LNG terminal and marine basin site. Cheniere is in the process of determining whether any of these would interfere with construction of the Project, and will file its determination with the Commission and identify future action. The pipeline would be within 150 feet of 12 existing oil and gas wells, of which 4 would be within the construction right-of-way. Cheniere would conduct preconstruction surveys to ground-truth the location of these wells, and avoid them through minor route realignments. A site-specific seismic hazard analysis conducted by Cheniere indicates that due to very low level of ground motion predicted at the site, earthquake hazards were not considered a controlling factor in the LNG terminal design. No geologic hazards would be expected to affect the proposed facilities.

5.1.2 Soils and Sediments

Construction of the LNG terminal would permanently affect about 2 acres of soils classified as either hydric or prime farmland. Cheniere would cover about 458 acres of existing processed bauxite residue beds with about 4.4 mcy of sediments dredged from creation of its marine basin. The dredged sediments would be uncontaminated clays, and the DMPAs would be revegetated at the conclusion of construction.

The majority of the pipeline would cross prime farmland soils that would be temporarily affected during construction. After consulting with the NRCS, Cheniere agreed not to segregate topsoil deeper than 18 inches in Victoria clay and Raymondville clay loam soils, along about 12.8 miles of the proposed pipeline route. For about 18.7 miles of the route, where agricultural lands are deeply plowed, Cheniere would bury the pipeline at least 4 feet below the surface. About 6 acres of prime farmland would be permanently lost due to operation of the aboveground facilities

along the pipeline. However, the NRCS does not believe this loss would be significant, and we agree.

After construction, agricultural lands along the pipeline would be restored to their previous condition and use. We conclude that the Project would have minimal impacts on soils because Cheniere would implement the FERC's Plan and Procedures.

5.1.3 Water Resources

Groundwater

Construction and operation of the Project would not have a significant impact on groundwater resources. The EPA has not designated the Gulf Coast aquifer, which underlies the Project, as a sole source aquifer. There are no public or private water supply wells, or officially designated wellhead protection areas, within 150 feet of the proposed Project. Because no bedrock was identified near the surface, Cheniere does not anticipate the need for blasting during construction.

The greatest potential for impact on groundwater would be from spills, leaks, or other releases of hazardous substances during construction or operation. Cheniere has agreed to implement the FERC's Procedures, which includes use of Spill Prevention and Response Procedures that meet state and federal requirements. Cheniere has filed a SPCC Plan and has stated it would file a revised SPCC Plan with greater Project-specific measures.

Surface Water

Construction of the terminal's new marine basin would impact about 78 acres of shallow bay habitat, and result in the transformation of shallow water in the La Quinta Channel into deeper water habitat. Water quality in the area being dredged would be temporarily affected by increased turbidity during dredging, but would return to preconstruction conditions following completion of dredging. During operation of the LNG terminal, the SCVs would produce fresh water which would be pumped into Sherwin's raw water reservoir north of the processing area. Hydrostatic test water would also be discharged into the reservoir. However, on rare occasions when the reservoir may be full (due to excessive rain events or other factors), water may be released into the bay through the drainage ditch on the west side of Cheniere's tract. Cheniere would obtain the necessary permits regulating dredging, return water from the DMPAs, hydrostatic test water, and release of stormwater and wastewater from the LNG terminal into the bay.

The proposed pipeline would cross two perennial streams and eight intermittent-flowing waterbodies. Most of the waterbodies would be crossed using the open cut method. One drain would be bored. To minimize impact on surface waters, Cheniere would implement the protective measures in the FERC's Procedures. We have accepted Cheniere's requested variance from our Procedures to cross waterbodies between March 1 and August 31 when longer, warmer days offer optimum construction conditions, quicker drying after brief rain events, and the most effective period for erosion control.

5.1.4 Wetlands and Vegetation

Wetlands

Construction of the Cheniere Corpus Christi LNG Project would affect a total of 14.2 acres of wetlands, including 12.9 acres at the LNG terminal site and 1.3 acres along the pipeline route. During construction, Cheniere would minimize impact on wetlands by implementing measures in the FERC's Procedures. Cheniere has requested one variance from the Procedures to allow an extra 25 feet of temporary pipeline construction right-of-way width across three wetlands, and we have reviewed site-specific justification for this request and find it acceptable. Operation of the LNG terminal would permanently affect 10.7 acres of wetlands, including 5.3 acres of seagrass beds, 1.4 acres of tidal flat, and 4.0 acres of coastal marsh. In consultation with appropriate resource agencies, Cheniere prepared an Aquatic Resources Mitigation Plan, including a conceptual wetland mitigation plan which provides for the creation of new wetlands and seagrass beds off-site at Shamrock Island in Corpus Christi Bay. We have recommend that Cheniere construct breakwaters 5-9 and 16-25 at the Shamrock Island mitigation site, unless required otherwise by the COE and/or NOAA Fisheries as a result of the COE's review of Cheniere's Section 404/10 permit application. Wetland mitigation ultimately implemented by Cheniere to compensate for unavoidable impacts would be determined during the COE Section 404/10 permit review.

Terrestrial Vegetation

Cheniere's LNG terminal tract contains about 12 acres of coastal grasses and about 51 acres of scrub/shrub vegetation. However, construction and operation of the LNG terminal would only impact about 5 acres of open land containing coastal grasslands and scrub/shrub vegetation. The remainder of the upland portions of the tract is industrial land.

Construction of the proposed pipeline and associated aboveground facilities would affect about 301 acres of agricultural and 76 acres of open land. The remainder of the upland portions of the right-of-way is industrial land. The open land includes grasslands and scrub/shrub vegetation. We have recommended that Cheniere avoid impacting trees wider than 12-inches-diameter at breast height during pipeline construction. After construction, the pipeline right-of-way would be restored to its previous condition and use. Landowners could replant crops in agricultural lands, and open land would be seeded by Cheniere with species selected after consultation with the NRCS. We have recommended that Cheniere should revise its Project-specific Restoration Plan to emphasize native species in its seed mix. During operation of the pipeline, mowing in parcels of open land would keep the right-of-way in an herbaceous state. We conclude that following our Plan and Procedures would result in the Project not having significant impacts on terrestrial vegetation.

5.1.5 Wildlife and Aquatic Resources

Wildlife

Impacts on wildlife resulting from construction and operation of the Project would include the temporary alteration and permanent loss of habitat. Wildlife habitat within the Project area includes open water, coastal marsh, tidal flat, coastal grasslands, scrub/shrub vegetation,

agricultural land, and palustrine wetlands. At the LNG terminal, about 5.6 acres of coastal marsh and tidal flat habitat combined would be permanently lost. Only about 5 acres of grassland and scrub/shrub habitat would be affected by construction and operation of the LNG terminal. Some shrubland habitat would be permanently converted to grassland habitat as a result of vegetation maintenance on the pipeline right-of-way. We do not expect wildlife to be significantly impacted by the 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 industrial land with limited usefulness as wildlife habitat.

Aquatic Resources

Operation of the LNG terminal would permanently affect about 5.3 acres of seagrass beds. Cheniere would mitigate for that loss by implementing its Aquatic Resources Mitigation Plan.

NOAA Fisheries identified EFH for postlarval, juvenile and subadult white shrimp, brown shrimp, red drum, postlarval and juvenile pink shrimp, and subadult Spanish mackerel in the Project area. Our EFH assessment concludes that temporary impacts, such as dredging the new marine basin, would not have significant long-term impacts. The permanent loss of EFH at the LNG terminal, totaling about 11 acres combined of seagrass, coastal marsh, and tidal flat, would be mitigated by Cheniere implementing its Aquatic Resources Mitigation Plan, and other mitigation measures required by the COE and NOAA Fisheries.

5.1.6 Threatened, Endangered, and Other Special Status Species

The FWS and NOAA Fisheries have identified a total of 24 federally listed endangered or threatened species that could potentially occur in the Project area. Based on our analysis of habitat that would be affected by the Project and other information, such as biological surveys conducted on behalf of Cheniere, we conclude that the Project would not affect or not adversely affect any of these species. We have recommended that Cheniere not be allowed to begin construction until consultation with the FWS and NOAA Fisheries is complete. Further, we recommend that Cheniere follow the NOAA Fisheries recommendation to protect federally listed marine mammals and sea turtles.

5.1.7 Land Use, Recreation, and Visual Resources

The nearest residences to the property boundary of the proposed LNG terminal are about 1.6 miles west. No residences are located within 50 feet of the proposed pipeline workspace. No public lands, developed recreational facilities, or special interest areas would be affected by the Project.

The most prominent visual features of the proposed LNG terminal would be three LNG storage tanks, each 175 feet above the current grade and 145 feet in diameter. However, the height of the LNG storage tanks would be 22 feet lower than the tallest structure on the adjacent Sherwin plant. We evaluated estimated views of the storage tanks from four surrounding observation points using visual simulations prepared by Cheniere. While the LNG storage tanks would be visible from surrounding locations, they would not dominate the landscape, would be consistent with existing views of adjacent industrial facilities, and would not represent a significant visual impact.

Cheniere has requested but has not yet received its Texas CZMP consistency determination from the TGLO, Coastal Coordination Council for its LNG terminal. We have recommended that Cheniere not be allowed to begin construction of the LNG terminal until it has received the Coastal Coordination Council's determination that the project is consistent with the Texas CZMP. The TGLO did make a finding of consistency for the proposed pipeline.

5.1.8 Socioeconomics

During construction of the LNG terminal, Cheniere would employ an average of about 330 workers. Construction of the pipeline and meter station would employ an average of 325 workers. About 75 full-time employees would be needed for operation of the LNG terminal. About 61 percent of the construction workforce would reside within 50 miles of the jobsite. The addition of non-local workers would not represent a significant increase in the population of San Patricio and Nueces Counties. The two counties combined also have adequate housing available for Project employees and their families. Local infrastructure and public services are developed enough to handle Project needs. The Project shall not have an adverse effect on local property values, and would not disproportionately impact any minority or low-income neighborhoods. The Project would benefit the local economy through expenditures for wages, purchases of materials, and taxes.

5.1.9 Transportation and Traffic

Onshore vehicular traffic generated during construction of the LNG terminal would increase by an estimated 2 to 3 percent over existing daily traffic volume on SH 35, the primary access route to the proposed terminal. While this would not be a significant impact on traffic flow on SH 35, there could be congestion on interchanges and intersections leading to the LNG terminal site. We have recommended that Cheniere consult with appropriate transportation authorities to determine the need for a Project-specific construction transportation management plan.

During operation, the LNG terminal would receive up to 300 LNG ships per year, resulting in an average of one additional vessel movement inward and outward per day through the Corpus Christi and La Quinta Ship Channels. The LNG ship traffic for the Project would represent less than a 3 percent increase in the total ship traffic in Corpus Christi Bay, and about a 23 percent increase in large vessel traffic.

5.1.10 Cultural Resources

Cheniere conducted cultural resource surveys and filed with the FERC and the SHPO survey reports that document inventories covering a portion of the LNG terminal site and all but 2.1 miles of the proposed pipeline route. The SHPO has accepted the survey reports and indicated that no historic properties would be affected within the areas inventoried. We have recommended that Cheniere not be allowed to construct any facilities or use any staging, storage, temporary work areas, or access roads until Cheniere files with the FERC all remaining cultural resources reports and SHPO review comments.

5.1.11 Air Quality and Noise

Although a slight degradation of the air quality due to pollutant emissions would occur, air emissions resulting from construction of the Project would not significantly affect ambient air quality in the Corpus Christi region. Cheniere would use dust control measures during construction of the LNG terminal and pipeline to minimize the generation of fugitive dust during construction. Air emissions from operation of the LNG terminal would be minimal because the equipment would burn natural gas as opposed to more polluting coal or oil. Cheniere has applied to the TCEQ for a state air quality permit. The TCEQ has preliminarily reviewed and approved the air quality modeling analysis that shows that the National Ambient Air Quality Standards would not be violated and emissions of designated "criteria pollutants" would not increase above the regulatory limit for prevention of significant air quality deterioration. Since the Project area is classified as in attainment for all criteria pollutants, a General Conformity Determination is not required.

Noise quality at the nearest NSAs would not be significantly affected by operation of the LNG facility. Although background noise may be heard by nearby residents, the facility would not exceed the 55 decibel limit recommended for the protection of public health and welfare. To further ensure that noise from operation of the facility would not impact residences, we have recommended that after the LNG terminal is in operation Cheniere conduct noise measurements to confirm that predicted noise impacts are not exceeded, and that Cheniere implement additional mitigation if necessary.

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 Corpus Christi and La Quinta Ship Channels. 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. We also calculated thermal radiation and flammable vapor hazard distances for an accident or an attack on an LNG vessel. Based on the extensive operational experience of LNG shipping, the structural design of an LNG vessel, and the operational controls imposed by the USCG 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. For similar reasons, an accident involving the onshore LNG import terminal is unlikely to affect the public. As a result, the risk to the public from accidental causes shall be considered negligible.

On January 3, 2005, the USCG issued a Letter of Recommendation for this Project, indicating that the waterway is suitable for LNG ship traffic. However, the Letter of Recommendation does not represent final authority to commence LNG marine transport operations. Issues related to the public impact of safety and security or exclusion zones would be addressed in the *LNG Vessel Management and Emergency Plan* to be developed by Cheniere and approved by the USCG.

5.1.13 Alternatives

We considered the alternatives of no action or postponed action. While the no action or postponed action alternatives would eliminate or postpone the environmental impacts identified in this EIS, the objectives of the proposed Project would not be met.

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 Cheniere Corpus Christi LNG 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 significant environmental advantages over the proposed site.

Our alternatives analysis included the evaluation of a pipeline route alternative that was the route originally proposed by Cheniere. We also evaluated two alternative routes that would originate from points east of Cheniere's proposed LNG terminal. None of the route alternatives would provide significant environmental advantages over the proposed pipeline route.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission issues their authorization for the proposed Project, we recommend that the Commission's Order Granting a Certificate of Public Convenience and Necessity (Order) include measures 1 through 57 of the following section. We believe these measures would further mitigate the environmental impacts associated with the construction and operation of the proposed Project.

1. Cheniere shall follow the construction procedures and mitigation measures described in its application, supplemental filings (including responses to staff data requests) and as identified in the EIS, unless modified by this Order. Cheniere 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 OEP before using that modification.
2. The Director of OEP has delegation 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 this Order; and
 - b. the design and implementation of any additional measures deemed necessary (including stop work authority) to assure continued compliance with the intent of the

environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from project construction and operation.

3. **Prior to any construction, Cheniere 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.**
4. The authorized facility locations shall be as shown in the 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, Cheniere 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 this Order. All requests for modifications of environmental conditions of this Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.**

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

5. Cheniere 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 *Upland Erosion Control, Revegetation, and Maintenance 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;

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- b. implementation of endangered, threatened, or special concern species mitigation measures;
 - c. recommendations by state regulatory authorities; and
 - d. agreements with individual landowners that affect other landowners or could affect sensitive environmental areas.
 6. **At least 60 days before the start of construction**, Cheniere shall file an initial Implementation Plan with the Secretary for review and written approval by the Director of OEP describing how Cheniere will implement the mitigation measures required by this Order. Cheniere must file revisions to the plan as schedules change. The plan shall identify:
 - a. how Cheniere 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 onsite 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 Cheniere 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 Cheniere's organization having responsibility for compliance;
 - f. the procedures (including use of contract penalties) Cheniere 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. Cheniere 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**, Cheniere shall mail the complaint procedures to each landowner whose property would be crossed by the Project.
 - a. In its letter to affected landowners, Cheniere shall:
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- (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 Cheniere'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 Cheniere's Hotline, they shall contact the Commission's Enforcement Hotline at (888) 889-8030.
- b. In addition, Cheniere 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.
8. Cheniere shall employ a team of environmental inspectors (at least two per construction spread with one available at the LNG terminal as appropriate during site preparation). The environmental inspectors shall be:
- a. responsible for monitoring and ensuring compliance with all mitigation measures required by this 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 this 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 this Order, as well as any environmental conditions/permit requirements imposed by other federal, state, or local agencies; and
 - f. responsible for maintaining status reports (see condition 9).
9. Cheniere shall file updated status reports prepared by the head environmental inspector with the Secretary on a weekly basis **until all construction and restoration activities are complete**. On request, these status reports shall 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;

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- b. a listing of all problems encountered and each instance of noncompliance observed by the environmental inspector(s) 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 this Order, and the measures taken to satisfy their concerns; and
 - f. copies of any correspondence received by Cheniere from other federal, state or local permitting agencies concerning instances of noncompliance, and Cheniere's response.
 10. Cheniere must receive written authorization from the Director of OEP **before commencing service** for 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 that rehabilitation and restoration of the right-of-way is proceeding satisfactorily.
 11. **Within 30 days** of placing the authorized facilities in service, Cheniere 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 Cheniere 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. **Prior to construction**, Cheniere shall file with the Secretary documentation of consultations with the COE regarding timing of the dredging for the LNG marine basin and maneuvering area. To the extent possible, Cheniere shall coordinate its dredging operations with the proposed COE dredging of the La Quinta Channel extension to avoid construction conflicts.
 13. Cheniere shall file with the Secretary **prior to construction** the following information on nonjurisdictional facilities, including the AEP transmission line and substation, San Patricio Municipal Water District pipeline, and three existing natural gas pipelines and associated aboveground facilities:
 - a. documentation of consultations with the appropriate agencies and the status of federal, state, or local permits or approvals required for their construction, abandonment, removal, or relocation. Consultations shall address handling and removal of potential hazardous substances during facility removal; and
 - b. status and copies of any surveys and reports prepared for waterbodies, wetlands, threatened and endangered species, and cultural resources.

14. **Prior to construction**, Cheniere shall file with the Secretary details of its coordination with the City of Port Aransas, and other local, state, or federal government entities, regarding its planned or potential assistance with ongoing or future shoreline protection efforts.
15. Cheniere shall include in its wetlands mitigation plan construction of breakwaters 5-9 and 16-25 at the Shamrock Island mitigation site, unless required otherwise by the COE and/or NOAA Fisheries as a result of the COE's review of Cheniere's Section 404/10 permit application.
16. Cheniere shall attempt to avoid the removal of trees along the pipeline right-of-way with a diameter at breast height greater than 12 inches. If such trees must be removed, Cheniere shall prepare a mitigation plan, in consultation with the TPWD, and file the plan with the Secretary **prior to construction**.
17. Cheniere shall consult with the TPWD and NRCS to develop a revised seed mix to be used in uplands and DMPAs that includes native grass species. Cheniere shall file the revised seed mix with the Secretary **prior to construction**.
18. Cheniere shall avoid clearing woody vegetation during the peak migratory bird nesting period between March 1 and August 31 of any year. If vegetation clearing must be conducted during this time, Cheniere shall survey for all migratory bird nests no more than three weeks prior to commencing work. If an active migratory bird nest is found, Cheniere shall consult with the FWS to identify the most appropriate measure that shall be taken to avoid or minimize impacts.
19. Cheniere shall not begin construction activities **until**:
 - a. the staff receives concluding comments from FWS and NOAA Fisheries regarding the proposed action;
 - b. the staff completes formal consultation with FWS and NOAA Fisheries, if required; and
 - c. Cheniere has received written notification from the Director of OEP that construction or use of mitigation may begin.
20. If facilities are not constructed **within one year** from the date of issuance of the authorization from the Director of OEP that construction may begin, Cheniere shall consult with the appropriate offices of the FWS and NOAA Fisheries to verify that previous consultations and determinations of effect are still current.
21. Cheniere shall prepare a plan, consistent with NOAA Fisheries recommendations, to minimize potential noise impacts on sea turtles and marine mammals from driving piles during construction of the LNG terminal marine basin and berths. The plan shall include measures to reduce sound transmission into the water (e.g., air bubble curtains, limitations on the type of hammer used, reductions in force applied to the pile) or a monitoring protocol to ensure listed species are not present in the zone of potential affect. The plan shall be filed with the Secretary for review and written approval by the Director of OEP **prior to construction**.

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22. Cheniere shall not begin construction of any component of its LNG terminal **until** it files with the Secretary a copy of the consistency determination issued by the TGLO Coastal Coordination Council.
23. Cheniere shall consult with the TDOT and other local entities responsible for transportation issues including San Patricio and Nueces Counties and the Cities of Gregory and Portland, and determine the need for a Project-specific Construction Transportation Management Plan. Such a plan shall provide specific measures that would be used to transport materials and construction workers to the proposed LNG terminal work site. Aspects of the plan may include, but are not limited to, identification of off-site vehicle parking areas, traffic control measures, traffic control personnel, and construction and delivery hours. Cheniere shall file with the Secretary, **prior to construction**, the results of this consultation and the Construction Transportation Management Plan if recommended by the transportation authorities.
24. Cheniere shall **defer construction** and use of its proposed facilities, including related ancillary areas for staging, storage, and temporary work areas, and new or to-be-improved access roads, **until**:
- Cheniere files with the Secretary all additional required inventory and evaluation reports, a SHPO-approved Project-specific unanticipated discovery plan, and any necessary treatment plans;
 - Cheniere files with the Secretary the SHPO comments on all cultural resources investigation reports and plans;
 - the ACHP has been given an opportunity to comment if any historic properties would be adversely effected by the Project; and
 - the Director of OEP reviews and approves all cultural resources reports and plans, and notifies Cheniere in writing that it may proceed with treatment or construction.

All material filed with the Commission containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CONTAINS PRIVILEGED INFORMATION – DO NOT RELEASE."**

25. Cheniere shall make all reasonable efforts to assure its predicted noise levels from the LNG terminal are not exceeded at the NSAs and file noise surveys showing this with the Secretary **no later than 60 days** after placing the LNG terminal in service. However, if the noise attributable to the operation of the LNG terminal exceeds 55 dBA L_{dn} at an NSA or the noise increase exceeds 10 dBA L_{90} at an NSA, Cheniere shall file a report on what changes are needed and shall install additional noise controls to meet the level **within one year** of the in-service date of the LNG terminal. Cheniere shall confirm compliance with these requirements by filing a second noise survey with the Secretary **no later than 60 days** after it installs the additional noise controls.

Cheniere shall file the facility design and construction details with the Secretary for review and approval by the Director of OEP either: prior to initial site construction; prior to construction after final design; prior to commissioning; or prior to commencement of service as indicated by recommendation numbers 26 through 49.

26. A complete plan and list of the hazard detection equipment shall be filed **prior to initial site construction**. The information shall include a list with 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.
27. Cheniere shall provide a technical review of its facility design that:
- a. Identifies all combustion/ventilation air intake equipment and the distance(s) to any possible hydrocarbon release (LNG, flammable refrigerants, flammable liquids, and flammable gases).
 - b. Demonstrates that these areas would be 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.

Cheniere shall file this review prior to initial site construction.

28. A complete plan and list of the fixed and wheeled dry-chemical, fire extinguishing, high expansion foam, hazard control equipment shall be filed **prior to initial site construction**. The information shall include a list with 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.
29. The **final design** shall include procedures for offsite contractors' responsibilities, restrictions, limitations, and supervision of the contractors by Cheniere staff.
30. The **final design** of the hazard detection equipment shall identify manufacturer and model.
31. The **final design** of the hazard detection equipment shall include redundancy and fault detection and fault alarm monitoring in all potentially hazardous areas and enclosures.
32. The **final design** of the hazard detection equipment shall provide flammable gas and UV/IR hazard detectors with local instrument status indication as an additional safety feature.
33. The **final design** of the fixed and wheeled dry-chemical, fire extinguishing, high expansion foam hazard control equipment shall identify manufacturer and model.

34. The **final design** shall include equipment and instrumentation for the measurement of translational and rotational movement of the inner vessel for use during and after cool down.
35. 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.
36. The **final design** shall include drawings and specifications of the spill protection system to be applied to the LNG tank roof(s).
37. The **final design** shall include drawings and specifications of the LNG storage tank piping support structure.
38. The **final design** shall include a fire protection evaluation carried out in accordance with the requirements of NFPA 59A, chapter 9.1.2.
39. Security personnel requirements for prior to and during LNG vessel unloading shall be filed **prior to commissioning**.
40. Operation and Maintenance procedures and manuals, as well as emergency plans, emergency evacuation plan and safety procedure manuals, shall be filed **prior to commissioning**.
41. Copies of the USCG security plan, vessel operation plan, and emergency response plan shall be provided to the FERC staff **prior to commissioning**.
42. The contingency plan for failure of the outer LNG tank containment shall be filed **prior to commissioning**.
43. 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**.
44. 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**.
45. Progress on the proposed construction project shall be reported in monthly reports filed with the Secretary. Details shall include a summary of activities, problems encountered and remedial actions taken. Problems of significant magnitude shall be reported to the FERC **within 24 hours**.

The following recommendations shall be applied throughout the life of the facility:

46. 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, Cheniere 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.**

47. **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 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.

48. 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.

49. 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 **within 24 hours**. 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. 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 for five minutes or more 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 safety-related condition that could lead to an imminent hazard and cause (either directly or indirectly by remedial action of the operator), for purposes other than abandonment, a 20 percent reduction in operating pressure or shutdown of operation of a pipeline or an LNG facility that contains or processes gas or LNG;
- 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 a separate follow-up report or follow-up in the upcoming semi-annual

operational report. All company follow-up reports shall include investigation results and recommendations to minimize a reoccurrence of the incident.

50. **Prior to construction**, Cheniere shall provide, in a filing with the Secretary, evidence of its ability to exercise legal control over the activities that occur within the portions of the thermal exclusion zones, listed in table 4.12.4.2-2 of the final EIS, that fall outside of the LNG terminal property line.
51. **Prior to construction**, Cheniere shall provide, in a filing with the Secretary, evidence of its ability to exercise legal control over the activities that occur within the portions of the vapor dispersion exclusion zones that fall outside of the LNG terminal property line.
52. Cheniere shall examine provisions to retain any vapor produced along the transfer line trenches and other areas serving to direct LNG spills to associated impoundments. Measures to be considered may include, but are not limited to: vapor fencing; intermediate sump locations; or trench surface area reduction. Cheniere shall file final drawings and specifications for these measures with the Secretary **prior to construction**.
53. Cheniere shall coordinate with the USCG to define the responsibilities of Cheniere's security staff in supplementing other security personnel and in protecting the LNG tankers and terminal.
54. Cheniere shall develop emergency evacuation routes/methods in conjunction with the local emergency planning groups and town officials for areas that are within any transient hazard areas. These evacuation routes/methods shall be filed with the Secretary for review and written approval by the Director of OEP **prior to construction**.
55. Cheniere shall develop an Emergency Response Plan (including evacuation) for its LNG terminal and coordinate procedures with 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 public use areas and residents of areas that are within any transient hazard areas;*
 - 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 commencement** of service. Cheniere shall notify the

FERC staff of all meetings in advance and shall report progress on its Emergency Response Plan at six-month intervals starting at the commencement of construction.

56. **Prior to construction**, Cheniere shall file with the Secretary documentation that suitable procedures and coordination exist between Cheniere, the Pilots, and the TDOT to minimize delays to the Port Aransas Ferry operations from LNG carrier transits.
57. Cheniere shall evaluate the need for additional dredging, and the quantity of dredging that would be required, to accommodate the maneuvering of LNG vessels up to 250,000 m³ capacity through the Corpus Christi and La Quinta Channels. Cheniere shall file the results of this evaluation with the Secretary for the review and approval of the Director of OEP **prior to the use** of LNG ships over 140,000 m³ in capacity.