

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov



December 8, 2005

Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, NE, Room 1A
Washington, D.C. 20426

Robert Kanter, Ph.D.
Port of Long Beach
Planning Division
925 Harbor Plaza
Long Beach, CA 90802

**Re: FERC Docket No. CP04-58-000, et al.
POLB Application No. HDP 03-079**

Dear Ms. Salas and Dr. Kanter:

The staff of the California Energy Commission (Energy Commission) is pleased to submit comments on the Draft Environmental Impact Statement / Environmental Impact Report (DEIS/EIR) prepared for the Long Beach Liquefied Natural Gas (LNG) Import Project proposed by Sound Energy Solutions (SES). On October 31, 2003, the Energy Commission staff submitted scoping comments to the Federal Energy Regulatory Commission (FERC) regarding preparation of the DEIS/EIR document (FERC Docket No. PF03-6-000). The Energy Commission has taken a lead role in coordinating state agencies that will be involved in permitting LNG facilities in California and in educating the public on LNG issues. In addition, the Energy Policy Act of 2005 specifies that the Governor of a state where a proposed LNG terminal would be located shall designate a state agency to consult with the FERC regarding applications and that this state agency may prepare a safety advisory report that addresses state and local safety considerations. Governor Schwarzenegger designated the Energy Commission as the agency responsible for preparation of a safety advisory report for the proposed Long Beach LNG Import Project. The Energy Commission staff filed its advisory report with the FERC on September 7, 2005.

Because the Governor has designated the Energy Commission as the state agency to consult with the FERC regarding state and local safety considerations, the Energy Commission is attempting to gain access to information concerning the proposed Long Beach LNG Import Project that the FERC has designated "critical energy infrastructure information" (CEII). Thus far, the Energy Commission has not received such information. Thus, all of these comments are based on publicly available information. The Energy Commission has requested an extension of time to submit additional

comments on the DEIS/EIR document that are based on the critical energy infrastructure information.

The comments provided below reflect the Energy Commission's role under the Warren-Alquist Act of assuring that the state develops adequate energy supplies while protecting public health and safety and the environment. In addition, the Energy Commission has extensive experience in evaluating the environmental issues and concerns that arise when siting major energy facilities through its jurisdiction for licensing thermal power plants with a generating capacity of 50 megawatts or greater.

Summary of Comments

In its recently adopted *2005 Integrated Energy Policy Report*, at page 129, the Energy Commission states, "The possibility of importing natural gas across the water from virtually any source worldwide has the potential to provide large volumes of adequate and reliable supplies and consequently hold down prices." The report is available at <http://www.energy.ca.gov/2005publications/CEC-100-2005-007/CEC-100-2005-007-CMF.PDF>. However, any LNG terminal must meet public health, safety, and environmental standards and, before a decision is made on whether to approve a proposal, it must first be the subject of a comprehensive environmental review under federal and state laws.

The Energy Commission staff is concerned that this DEIS/EIR document does not meet the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Policy Act (CEQA). In particular, we note the following deficiencies:

- The DEIS/EIR document is incomplete in that it lacks information regarding some of the environmental impacts of the project and connected actions. In particular, the draft should have included a preliminary Waterways Suitability Assessment (WSA) and a complete draft air quality conformity analysis.
- Development of some mitigation measures, such as preparation of a Cost-Sharing Plan and Emergency Response Plan, is improperly deferred.
- The scope of the project analyzed should be expanded to include any necessary changes to the existing Southern California Gas Company (SoCalGas) natural gas pipeline system.
- The alternatives analysis should compare the proposed project to offshore alternatives.
- The assessment of impacts should assess the feasibility of using reclaimed water instead of fresh water in accordance with state policy.

- Some of the analysis of environmental impacts needs to be corrected or otherwise revised to improve the DEIS/EIR as an informational document for the public and decision-makers. The Energy Commission staff offers suggestions for many sections of the DEIS/EIR document, including geology, water resources, biological resources, socioeconomics, transportation, cultural resources, air quality, and noise. But most of the comments pertain to the section addressing reliability and safety. In particular, the Energy Commission staff provides information that supports a substantially lower thermal radiation flux limit than the level assumed by the DEIS/EIR document to protect the public from exposure to radiant heat.

We believe NEPA and CEQA require revisions and supplementation of the DEIS/EIR document in response to our comments. Declining to include the information summarized above or make our suggested revisions in the DEIS/EIR document would leave the public and decision-makers with an incomplete analysis of direct and indirect impacts of the proposed project and an overly narrow analysis of feasible alternatives. In addition, we believe the revisions and supplementation will require recirculation of the DEIS/EIR document for public review or, at least, the modified portions of it with the new information. We hope our comments prove to be helpful and enhance the accuracy, quality, and legal sufficiency of the final EIS/EIR document for the proposed Long Beach LNG Import Project.

Completeness of the Draft

The DEIS/EIR document was published without some information that is needed for the document to be complete. The most important omissions are:

- The DEIS/EIR document does not include the draft WSA. Although the U.S. Coast Guard is a cooperating agency for purposes of the environmental review, and Coast Guard Navigation and Inspection Circular No. 05-05 indicates that the draft WSA should be included in the draft environmental document (Circular at pages 6-7, 9, and Enclosure 1), this was not done. Failure to include a draft WSA hampers review by the public since matters such as reliability and safety should be assessed in a simultaneous review of marine and onshore portions of the project.
- The DEIS/EIR document does not include a complete draft air quality conformity analysis. While the document does include a tentative draft in Appendix E, this tentative draft indicates that it is missing key information from SES and indicates that such information is to be filed by SES in the FERC docket before the end of the comment period on the DEIS/EIR document (see page E-6). Thus, the information made available to the public regarding air quality as part of the DEIS/EIR document is incomplete.

- The DEIS/EIR document does not include specific responses to many of the points made in the Energy Commission's Safety Advisory Report.

The DEIS/EIR document is also incomplete because mitigation measures include the development of some plans, the preparation of which has been improperly deferred. Some of the more important planning activities that have been improperly deferred relate to cost sharing for security and emergencies and to emergency response. Submission of a Cost Sharing Plan for security and emergency costs will not occur until submission of a Follow-on WSA to be filed before the final EIS/EIR document is issued (see DEIS/EIR pages 4-164 to 4-165). Evacuation routes and an Emergency Response Plan (including evacuation) are to be filed before initial site preparation (DEIS/EIR pages 4-167 to 4-168). The Energy Commission staff believes that, since such plans are being used to mitigate safety risks, they must be prepared and made available as part of the EIS/EIR process. The regulations which implement NEPA and CEQA require that environmental documents describe proposed mitigation. NEPA regulations provide that an EIS "include descriptions of . . . means to mitigate adverse environmental impacts." 40 C.F.R. § 1502.16(h). CEQA regulations provide that "[a]n EIR shall describe feasible measures which could minimize significant adverse impacts," Cal. Code Regs., tit. 14, § 15126.4 (a) (1), and that "[f]ormulation of mitigation measures should not be deferred until some future time," Cal. Code Regs., tit. 14, § 15126.4 (a) (1) (B).¹

Both NEPA and CEQA regulations make it clear that when significant new information is made available after an initial draft is published, the lead agency should provide the information to the public and provide an additional time for public comment. NEPA regulations at 40 C.F.R. § 1502.9 (a) provide: "If a draft statement is so inadequate as to preclude meaningful analysis, the agency shall prepare and circulate a revised draft of the appropriate portion." CEQA regulations at Cal. Code Regs., tit. 14, § 15088.5 (a) provide: "A lead agency is required to recirculate an EIR when significant new information is added to the EIR after public notice is given of the availability of the draft EIR for public review under Section 15087 but before certification."

Scope of the Project Analyzed

The estimated cost of interconnecting the proposed LNG terminal to the SoCalGas natural gas pipeline system indicates that the scope of the project analyzed in the draft does not include all components of the project as required by NEPA and CEQA. Under NEPA, the project is to include all "connected actions." 40 C.F.R. § 1508.25 (a) (1). Under CEQA, the "whole of an action" is to be analyzed. Cal. Code Regs., tit. 14, § 15378 (a). The scope of the project analyzed should include changes that may be

¹ CEQA regulations do provide that mitigation measures "may specify performance standards which would mitigate the significant effect of the project and which may be accomplished in more than one specified way." Cal. Code Regs., tit. 14, § 15126.4 (a) (1) (4). But, no performance standards for emergency response are set out in the DEIS/EIR document.

necessary to the SoCalGas natural gas pipeline system. Information the Energy Commission has obtained suggests the costs of interconnecting the Long Beach LNG Import Project to the SoCalGas system to accommodate deliveries of 1 billion cubic feet per day (Bscfd) of natural gas would be \$60 million. See presentation (page 10) of John Dagg of SoCalGas at a workshop sponsored by the California Resources Agency on June 1, 2005, available at http://www.energy.ca.gov/lng_docket/documents/2005-06-01_workshop/presentations_2005-06-01/. Such costs are likely to include infrastructure changes that would have a physical impact on the environment that should be analyzed in the EIS/EIR document.

Alternatives

The alternatives analysis improperly eliminates offshore projects as an alternative to the proposed project; these alternatives need to be analyzed in detail. Section 1.1, "Purpose and Need" on page 1-2, states that the proposed project has three objectives: (1) provide up to 1 Bscfd of natural gas to Southern California; (2) supply up to 150,000 gallons per day of LNG vehicle fuel; and (3) provide storage of up to 320,000 cubic meters of imported LNG to reduce fluctuations in the local supply. The DEIS/EIR document (pages 3-11 to 3-17 and page 3-19) then eliminates offshore alternatives because they allegedly cannot meet all of the project objectives. However, this approach does not meet the requirements of NEPA or CEQA for analysis of alternatives to the proposed project.

The primary flaw in the analysis presented is that it does not take into account the relative importance of the objectives of the project. In particular, the first of the project objectives, providing a new source of natural gas to the Southern California market, is far more important than the other objectives. In cases decided under NEPA, courts have cautioned agencies not to put forward a purpose and need statement that is so narrow as to "define competing 'reasonable alternatives' out of consideration (and even out of existence)." *Simmons v. U.S Army Corps of Engineers*, 120 F.3d 664, 666 (7th Cir. 1997). See also *Alaska Wilderness Recreation and Tourism Association v. Morrison*, 67 F.3d 723, 728-730 (9th Cir. 1995). The regulations which implement CEQA provide: "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain *most* of the *basic* objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." Cal. Code Regs., tit. 14, § 15126.6(b) (emphasis added).

In accordance with both NEPA and CEQA, it is necessary to evaluate off-shore alternatives since they meet *most* of the *basic* objectives of the proposed project and because they would reduce the risk of significant impacts associated with operating an LNG terminal and eliminate the need for operating large LNG carriers near heavily populated and economically critical regions of the California coast. Moreover, the discussion of offshore alternatives should be extensive and robust since NEPA regulations provide that the environmental document should "[r]igorously explore and

objectively evaluate all reasonable alternatives,” “[d]evote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits,” and “[i]nclude reasonable alternatives not within the jurisdiction of the lead agency.” 40 C.F.R. §§ 1502.14(a), (b), and (c). Without an evaluation of offshore alternatives, the draft EIS/EIR document fails to meet informational requirements under both NEPA and CEQA.

In addition, the Energy Commission staff has the following specific comments on the DEIS/EIR section on project alternatives:

- Section 3.2.2.1, Existing LNG Facilities, pages 3-6 to 3-7. The section discusses the provision of LNG for truck and bus fleets to replace diesel-fueled vehicles. The emphasis in this section on LNG for truck and bus fleets suggests providing LNG for this use is a critical objective of the proposed project and without this ability the project cannot meet its objectives. The volume of LNG fuel for truck and bus fleets appears to constitute only a small percentage of the LNG delivered to the facility. As an informational document, the DEIS/EIR document should quantify the percentage of the LNG to be delivered for truck and bus fleets as a share of the total project. This would allow an objective assessment of the importance of this objective to the project goals.
- Section 3.2.2.2, Proposed LNG Facilities, page 3-15, paragraph 2. It is stated under “Offshore LNG Import Terminal Technical Issues” that “offshore terminal designs could not provide LNG for use as a vehicle fuel” because liquefaction is “generally only done on a large scale when there is a relatively inexpensive source of natural gas.” In the discussion of existing LNG facilities, several small liquefaction facilities using market priced natural gas are discussed. This apparent contradiction should be addressed. Reliquefaction of offshore LNG would add to the cost of LNG when compared to direct use of imported LNG, but may be competitive with existing sources. An alternative to reliquefaction would be using a small vessel for bringing the relatively small quantities of LNG needed for vehicle fuel from an offshore facility (a process called lightering). This approach does not appear to have technical barriers and may be cheaper than reliquefaction of offshore LNG. To assess the feasibility of this alternative, we recommend that the cost of small-scale liquefaction be quantified and the technical potential and costs of lightering offshore LNG for vehicle use be assessed, together with a comparison of the environmental impacts of the offshore and onshore facilities.
- Section 3.2.2.2, pages 3-14 to 3-15. The DEIS/EIR document indicates that storage is an important objective and that the proposed project better meets this objective than offshore alternatives. But, the DEIS/EIR document fails to substantiate the statement on page 3-15 that “Adverse weather has a higher probability of delaying LNG deliveries to unprotected offshore terminals.” Moreover, the DEIS/EIR document fails to take into account the impact of onshore natural gas infrastructure

on deliverability of supply to customers. The Energy Commission has obtained information from SoCalGas that suggests that there would be no deliverability problems associated with shipping delays to onshore or offshore ports because of the ability to cover shortfalls from onshore sources including nearby natural gas storage fields. See presentation (page 6) of David Taylor of SoCalGas at a workshop sponsored by the California Resources Agency on June 1, 2005, available at http://www.energy.ca.gov/lng_docket/documents/2005-06-01_workshop/presentations_2005-06-02/.²

Geology

- Section 4.1.2.1, Environmental Setting, page 4-2, paragraph 1. The Pacific Border physiographic province refers to the entire west coast from Southern California to the state of Washington. The Los Angeles Basin is located in the Transverse Ranges physiographic province of California, an area of Pleistocene and Holocene uplift associated with thrust faulting, strike-slip faulting and folding. We suggest use of the California physiographic province nomenclature in order to be more descriptive of the tectonic environment of the Los Angeles Basin.
- Section 4.1.2.1, page 4-2, paragraph 2. We suggest adding the underlined text to the third sentence so it reads as follows: "...is complicated in the Los Angeles area and the Tranverse Ranges by compressional..."
- Section 4.1.2.1, page 4-2, paragraph 3. We recommend clarifying the abbreviation "THUMS" in the text, as well as in the list of "Acronyms and Abbreviations" on page xvi. We also suggest that the text referring to the fault be phrased as follows: "...THUMS-Huntington Beach (THUMS-HB) thrust fault." The subsurface location of the fault should be included on Figure 4.1.4-1.
- Section 4.1.2.2, Impact and Mitigation, page 4-3, paragraph 1, line 14. We suggest clarification of the nature of "geologic materials" to be impacted by minor disturbance. Are the geologic materials consistent with the "...consolidated fluvial and alluvial deposits beneath the northern extent of the pipelines..." mentioned in Section 4.1.5, Paleontological Resources, lines 2 and 3?
- Section 4.1.3.2, Impact and Mitigation, page 4-4, paragraph 1. The DEIS/EIR document states that "all active and inactive pipelines encountered *during* LNG terminal site preparation would be relocated, removed, or abandoned in place..." The current design calls for concrete or steel piles to be driven between 90 and 120 feet to competent material. The environmental and geotechnical consequences of a

² The analysis should also take into account Mr. Taylor's observation that the relative locations of the receipt points, demand centers, and storage fields on the SoCalGas system are such that there is a *greater* risk that customers of the proposed project will be curtailed as a result of sudden unplanned interruptions of supply than is the case for the offshore projects proposed off Ventura County. Id. at 7.

rupture of an active oil pipeline could be high. We recommend that the possibility of driving piles into active or abandoned oil pipelines be addressed.

- Section 4.1.4.1, Seismic Hazards, Earthquakes, page 4-7, Table 4.1.4-1. We suggest adding the Whittier Narrows earthquake to the list of recorded earthquakes in Table 4.1.4-1, or elsewhere in the text. Although only a moment magnitude (Mw) 6.0 event, the Whittier Narrows earthquake, which took place on October 1, 1987 and occurred along the Puente Hills blind thrust, occurred within 30 miles of the Long Beach LNG site. Characteristics of the Puente Hills blind thrust, including geometry, orientation and earthquake potential, are similar to those associated with the THUMS-HB thrust fault, which is closer in proximity to the project site.
- Section 4.1.4.1. Seismic Hazards, Earthquakes, page 4-8, paragraph 1. We recommend consideration of potential ground motion hazard associated with the THUMS-HB blind thrust. The North Ridge and Whittier Narrows earthquakes occurred on similar active faults, and the magnitudes can be very high. Since the location of the THUMS-HB fault relative to the Long Beach LNG terminal site is not shown, it is difficult for the reader to judge whether an earthquake along the fault will have an adverse affect on the project site. We suggest that the vertical distance to the fault from the present ground and surface, if it is located under the site, be noted as well. If the THUMS-HB fault is not considered to be active, or not to be a blind thrust as text in Section 4.1.2.1, paragraph 3 appears to indicate, then we agree that consideration of a potential earthquake along this fault is not necessary.
- Section 4.1.4.3. Impact and Mitigation, Subsidence, page 4-13, paragraph 1, lines 2-3. We recommend addressing the possibility of driving concrete or steel piles into active or inactive water pipelines associated with the water injection system.

Water Resources

- Section 4.3, Water Resources, pages 4-20 to 4-32. In our Scoping Comments to the FERC, we suggested that the EIS/EIR "should identify and evaluate measures to mitigate the spread of LNG spills on water (e.g., floating berms around a spill at sea or a tanker at berth)." The Water Resources section of the DEIS/EIR document lacks any discussion of the effects of LNG spills on open water or the on-water mitigation of such releases. We recommend that the EIS/EIR document address the environmental effects on water quality and biology of possible LNG spills in Long Beach Harbor or the open ocean and associated mitigation measures. This should include a discussion of the fate of heavier hydrocarbons found in LNG such as butane, ethane (C₂), and propane.
- Section 4.3.2.2, Impact and Mitigation, page 4-21 and page 4-24. The project proposes to use approximately 24 million gallons of fresh municipal water obtained from the City of Long Beach for hydrostatic testing of the LNG storage tanks. Additionally, the project proposes to use 4.8 million gallons of fresh water annually

for fire water and 1.2 million gallons annually for general operations. Although the DEIS/EIR document concludes that this use of fresh water would not constitute a significant impact, California State Policy (e.g., State Water Resources Control Board Resolution 77-1) encourages and promotes use of recycled water for non-potable purposes. It appears that recycled water could be used at the Long Beach LNG terminal site. The Long Beach Water Department's planned Phase 3 Recycled Water System Expansion will begin supplying recycled water directly to the Port of Long Beach sometime after 2009 (http://www.lbwater.org/projects/water_reuse.html [Long Beach Water Department Recycled Water System Expansion] and http://www.lbwater.org/pdf/projects/lbwd_cip0506.pdf [Long Beach Water Department Capital Construction Plan, 2005-2010]). This date is in line with the proposed timeline for construction and testing of the LNG storage tanks. As such, we recommend that the use of recycled water at the Long Beach LNG Import Project be considered in the alternatives section of the EIS/EIR document.

- Section 4.3.3.2, Impact and Mitigation, Operation, page 4-32, and Appendix B, page B-13, line 1. The water quality impacts of possible pollution in storm water runoff from the project are proposed to be mitigated by the "installation of treatment controls such as on-site retention/detention basins and catch basin filters where necessary to remove pollutants from storm water before it enters the storm drain system." In order to effectively mitigate for possible impacts, the project's Storm Water Pollution Prevention Plan should include site-specific calculations and configurations for the retention basins (as well as all other Best Management Practices, where practicable).

Biological Resources

We recommend the EIS/EIR document provide a detailed discussion of direct, indirect, and cumulative impacts that may affect biological resources. All components of the project should be included in this analysis, including the facility site, construction laydown area, and pipeline routes. Impacts would also include potentially adverse effects from human activity, lighting, noise, exotic species, and increased sediments or toxic wastes.

For project-related impacts on sensitive resources and protected species, mitigation measures should be outlined (see CEQA Guidelines, Cal. Code Regs., tit. 14, § 15126.4). Mitigation measures should provide avoidance measures, or reduction of project impacts if avoidance is infeasible. In addition, we suggest monitoring plans which evaluate project impacts on marine and terrestrial biological resources, and which evaluate the effectiveness of the mitigation measures. Suggested mitigation measures would also include seabird and marine mammal protection plans, an oil spill contingency plan, and a drilling fluid monitoring plan for the project areas requiring directional drilling (i.e., Cerritos and Dominguez Channels).

We provide the following specific suggestions and comments:

- Section 4.4.1, Significance Criteria, page 4-33. We suggest the significance criteria list be expanded to include the criteria for significance suggested for biological resources in Appendix G of the CEQA Guidelines (see CEQA Guidelines, Cal. Code Regs., tit. 14, § 15126.2 and Appendix G, "Environmental Checklist Form"). The DEIS/EIR document currently has only two general criteria, one for fish and wildlife populations, the other for vegetation or natural communities. It would help inform the reader to be more specific as to what "substantially affect" in the first general criterion means. For example, an additional criterion could be one based on interference with the movement of any native or migratory species, their corridors, or their nursery sites. The criteria should also refer to candidate and sensitive species identified in local or regional plans, policies, or regulations, not just rare or endangered species as is currently the case.
- Section 4.4.2, Terrestrial Resources, page 4-33. We recommend including a biological resources Geographic Information System (GIS) map defining vegetated areas and acreage and known or historical locations of sensitive species, particularly wildlife. We also suggest including a second map that superimposes the project footprint onto the biological resources figure, and outlining the areas, if any, where vegetation and habitat would be removed.
- Section 4.4.2, page 4-33, paragraph 3. This paragraph states that there would be no long-term effects resulting from the project. It states additionally that some wildlife would be impacted as a result of project activities. We advise that the EIS/EIR document present the results of current biotic surveys in the project area conducted by trained biologists at the appropriate time of year. The results should indicate wildlife species present, their habitats, local status, and distribution. In addition, we recommend a detailed (qualitative and quantitative) analysis of potential project impacts on these species for each of the project elements. The analysis would address the specific potential impacts on species resulting from project construction and from long-term operation, and from project alternatives. We recommend the analysis estimate any increase in exotic species potentially resulting from the proposed project and the potential to displace or prey on protected species. The analysis should also include potential impacts resulting from noise, light, and emergencies such as fire or spills.
- Section 4.4.3.1, Marine Organisms, Impact and Mitigation, page 4-35, paragraph 1. This paragraph states that noise and accidental release of hazardous materials could impact marine organisms in the project area. We recommend that potential impacts of specific project activities be outlined for protected marine organisms found in the project zone.
- Section 4.4.3.1, page 4-36, paragraph 1. We suggest that the specific effects of dredging and resulting turbidity and suspended sediment be analyzed in this section.

This analysis would define the ambient condition found in Long Beach Harbor, and the potential level of sediment to result from project activity. We recommend that the EIS/EIR document also include an analysis of potential effects on biological resources resulting from exposure to contaminated sediments.

- Section 4.4.3.1, page 4-36, paragraph 2. We recommend that this section define the potential area of impact resulting from sediments, based on current conditions and local currents.
- Section 4.4.3.1, page 4-36, paragraph 3. We recommend a monitoring plan be included which measures sediment resulting from project construction and operation, and effects on marine organisms. While this section cites a 1988 study that indicated no effect from dredging, we suggest that the EIS/EIR document analyze potential effects on particular species resulting from specific LNG project impacts.
- Section 4.4.3.1, page 4-36, paragraph 6. We suggest that data be included which shows the ambient noise levels now present in Long Beach Harbor. Additionally, the EIS/EIR document should present the potential levels resulting from noise-inducing project activities, such as pile-driving. We recommend the project be analyzed for specific effects resulting from such noise on marine and terrestrial species.
- Section 4.4.3.1, page 4-37, paragraph 2. We suggest that a monitoring plan be included which would measure effects on marine organisms and habitats resulting from a hazardous material discharge.
- Section 4.4.3.1, page 4-37, paragraph 5. We recommend providing a mitigation and monitoring plan for any spills resulting from horizontal directional drilling.
- Section 4.4.3.2, Water-Associated Birds, page 4-38, paragraph 1. We recommend providing an analysis of significant noise-producing activities such as pile-driving on resident birds. We suggest providing appropriate avoidance or mitigation measures to avoid impacts to nesting birds. We also recommend providing an analysis of any significant impacts from dredging and sedimentation to prey species for resident birds.
- Section 4.4.3.2, page 4-38, paragraph 2. We recommend that the EIS/EIR document provide specific analysis of the effect of potentially disturbing project activities, such as pile-driving, on the black-crowned night heron rookery located at Gull Park on the Navy Mole site.
- Section 4.4.3.3, Essential Fish Habitat Assessment, page 4-41, paragraph 2. We recommend providing specific analysis of current conditions and the potential increase in sediments or hazardous materials from project construction and

operation. We also recommend providing specific mitigation measures in the EIS/EIR document for these potential impacts. We suggest that monitoring measures that evaluate the effectiveness of the mitigation measures be developed and implemented. We also recommend that the document include a seabird protection plan, oil spill contingency plan, and a drilling fluid monitoring plan.

- Section 4.4.4, Threatened and Endangered Species, page 4-42, Table 4.4.4-1. We recommend that the source data (such as US Fish and Wildlife Service lists, current California Natural Diversity Database searches, and local surveys) for sensitive resources and habitats be referenced within the table.
- Section 4.4.4, page 4-42, paragraph 1. Under the federal Migratory Bird Treaty Act (MBTA) any impact to migratory birds may be considered significant. We recommend that project impacts be analyzed for significance under all applicable federal, state, and local laws, including the MBTA. Project impacts should be analyzed for all potential impacts to resident, nesting, or wintering birds. We recommend that appropriate avoidance or mitigation measures be included to minimize impacts to protected birds.
- Section 4.4.4, page 4-42, paragraph 1. We recommend that the EIS/EIR document identify or reference the agency staff and contact periods for consultation with agency staff (see CEQA Guidelines, Cal. Code Regs., tit. 14, § 15129).
- Section 4.4.4.1, Federal Threatened and Endangered Species, page 4-43, paragraph 3. The DEIS/EIR document states that the least tern (Federal and California Endangered) nests more than 1500 feet away from the proposed LNG terminal site. Table 4.4.4-1 also states that the least tern nests on Terminal Island. We suggest that surveys of the nesting tern population on or near Terminal Island be conducted. We suggest that the EIS/EIR document analyze potential impacts to any resident birds on Terminal Island, and provide mitigation measures to avoid or lessen impacts on nesting birds (see CEQA Guidelines, Cal. Code Regs., tit. 14, § 15126). In particular, if there are any nesting terns (or other migratory birds) found in proximity to the proposed project, we suggest construction and pile driving occur with an appropriate buffer distance, or outside of the nesting period.
- Section 4.4.4.1, page 4-45, paragraph 1. The American peregrine falcon has been observed nesting on Terminal Island. We suggest that the EIS/EIR document provide an analysis of conditions which may disrupt nesting peregrine falcons (California Endangered), such as pile driving. We also recommend providing avoidance measures to prevent disruption to nesting birds.

Socioeconomics

- Section 4.6, Socioeconomics, pages 4-64 to 4-76. We suggest all information (housing, population, unemployment, etc.) be updated to be as close to 2005 as

possible, and note the year. There are companies that provide updated census data such as Claritas and Geolytics.

- Section 4.6.3, Economy and Employment, pages 4-65 to 4-67, and Section 4.6.8 Tax Revenues, pages 4-71 to 4-72. To provide a better understanding of the economic benefits of the Long Beach LNG Import Project, we suggest use of an economic impact model such as IMPLAN (Impact Analysis for Planning) for secondary impacts where appropriate. It would also be helpful to note the years of the dollars for the following data/information:
 1. capital costs (plant and equipment) of the project;
 2. total project costs;
 3. an estimate of locally purchased equipment and materials for construction and operation;
 4. an estimate of school impact fees, if applicable;
 5. average direct construction employment;
 6. secondary (indirect and induced impacts using and showing type II employment multipliers) construction and operation employment;
 7. direct construction and operation income;
 8. secondary construction and operation income using and showing type II income multipliers;
 9. estimated construction sales tax; and
 10. estimated operation sales tax.
- Section 4.6.3, Economy and Employment, page 4-67. Table 4.6.3-2 shows only peak construction workers for the Long Beach LNG Import Project by percent. We suggest providing the availability of skilled workers by craft required for construction and on an average monthly basis, and the total peak construction workers needed for the project. It would also be helpful to show availability of skilled worker by craft for operations. This information could then be compared to labor force estimates for Los Angeles and Orange Counties (from the California Employment Development Department) for similar skilled workers by craft classifications. This will help document the labor force availability in the local labor market (Los Angeles and Orange Counties) for the proposed project.
- Section 4.6.8, Tax Revenues, page 4-72, paragraph 1. We suggest that the special district that is to receive \$900,000 be identified.

Transportation

- Section 4.7.2.3, Mitigation, page 4-87, paragraph 3, and Executive Summary, page ES-17. The DEIS/EIR document states that the Port of Long Beach (POLB) will reassess the level of service of the Henry Ford Avenue/Anaheim Street intersection and the need for improvements (e.g., re-striping) in consultation with the City of Los Angeles Department of Transportation (LADOT) prior to starting construction of the

proposed LNG terminal. We suggest that Agency Recommended Mitigation 1 be revised to include a specific timeframe for the consultation with the LADOT to occur to ensure that the mitigation can be completed prior to project construction commencing.

- Section 4.7.3.2, Impact and Mitigation, pages 4-91 and 4-92. The discussion of the impacts on ship traffic does not distinguish between classes of traffic and estimates impact based on average delays. Presumably, the impacts on ship movements will be primarily on ships serving facilities near the proposed LNG facility.

Nearly 80 percent of the refined petroleum products imported into California are received at marine terminals located in the Los Angeles Basin. Within 2.2 miles of the proposed facility, there are several operational petroleum infrastructure marine terminals. Based on information obtained from the California State Lands Commission and other sources,³ Energy Commission staff analyzed the quantity of crude oil and refined products that were processed through these petroleum infrastructure marine terminals during 2004 and concluded that within 2.2 miles of the location of the proposed site are located:

- All of the crude oil marine terminals in the San Pedro Harbor;
- Forty-five (45) percent of the total volume of gasoline and blending components transferred through the marine terminals in the San Pedro Harbor;
- Forty-four (44) percent of the total volume of diesel and jet fuel transferred through the marine terminals in the San Pedro Harbor;
- Eighty-one (81) percent of the total volume of fuel oil and bunker fuel transferred through the marine terminals in the San Pedro Harbor; and
- The entire Valero Wilmington refinery.

Because impacts will be localized, the impacts on these locations are not adequately characterized by average delays within the larger port. The growth of marine shipments of petroleum products and imported crude oil through the Ports of Los Angeles and Long Beach has been forecasted by the Energy Commission and it is necessary to examine the potential adverse impacts on these facilities.

³ The State Lands Commission collects a variety of information from operators of all marine oil terminals. The statistics provided to staff at the Energy Commission included quantity of crude oil and refined petroleum products that were loaded or discharged at individual petroleum infrastructure marine terminals throughout the state during 2004. Energy Commission staff compared this information to proprietary data obtained from Port Import Export Reporting Service (PIERS). Based on these comparisons and the inclusion of other confidential information examined by the Energy Commission, a combined database was developed. The information contained in this combined database was used to determine the quantity of crude oil and refined products that were loaded or discharged at each of the petroleum infrastructure marine terminals in the San Pedro Harbor.

The Energy Commission letter submitted to the Coast Guard on August 5, 2005 as comments in the WSA process (Coast Guard Docket No. COTP LA-LB 05-005) identified the following three areas of concern:

1. Potential impact on petroleum infrastructure in the San Pedro Harbor as a result of a catastrophic incident.
2. Loss of operational transit time in the San Pedro Harbor due to the security zones that will be associated with movement and berthing of liquefied hazardous gas (LHG) tank vessels.
3. Elevated threat levels invoked by the Department of Homeland Security and the potential diminishment of movement by marine vessels in the San Pedro Harbor.

Details of these concerns are described in the letter available at http://www.energy.ca.gov/lng/documents/long_beach/2005-08-05_CEC_LETTER_USCOASTGUARD.PDF.

We recommend that the concerns raised in the Energy Commission's letter be addressed in the EIS/EIR document specifically with respect to petroleum marine transport and infrastructure.

Among these concerns that have not been addressed by the DEIS/EIR document is the impact of potential Department of Homeland Security (DHS) security zones and the impact on port operations. DHS periodically changes the threat alert status for the United States or specific geographic areas of the country. The EIS/EIR document should identify any changes in geographic scope of security zones for LNG tank vessel operations for other land-based LNG terminal operations over the last three years.

Specifically, have any existing security zones been enlarged as a direct result of elevated threat levels posted by the DHS? Further, have there been any other operational restrictions for marine vessels, including petroleum tank vessels, over this same period of time during periods of elevated threat levels? If so, the EIS/EIR document should address how elevated threat levels posted by the DHS could further reduce or restrict availability of operational time within the San Pedro Harbor.

We recommend addressing explicitly the impacts and mitigation measures on marine oil terminals, tanker movements, and petroleum infrastructure and quantifying the potential economic impacts on the nation's and state's petroleum infrastructure due to the critical importance of petroleum fuel operations in the Port of Long Beach and its value to California and neighboring states. These impacts

should be compared to impacts from alternative projects, including off-shore alternatives.

Cultural Resources

The following comments only address the consideration of cultural resources under California state law. It is recommended that the POLB use these comments to ensure that all cultural resources are identified, that any impacts to significant cultural resources are mitigated below a significant level, and that the project is in compliance with all pertinent state laws.

The Energy Commission staff's Scoping Comments provided to the FERC asked two questions related to cultural resources: Will any historic port facilities be affected, and will new buried facilities (for example, gas pipelines) affect any archaeological resources? The DEIS/EIR document did not adequately address either of these questions.

- Section 4.8.2.2, CEQA, page 4-93. The DEIS/EIR document states that the "POLB meets its responsibilities in consultation with the SHPO [California State Historic Preservation Officer]." This suggests that the project has had Office of Historic Preservation (OHP) oversight for and/or approval of project efforts to fulfill cultural resources obligations under CEQA. The OHP certainly provided guidance regarding federal Section 106 responsibilities, but if the OHP made comments specifically on the CEQA aspects of the project, it would be unusual, and the comments would be purely advisory. The role of the SHPO with respect to the project's CEQA responsibilities should be clarified throughout the Cultural Resources section of the EIS/EIR document. Several SHPO letters dealing with the project's cultural resources issues are mentioned (end of sections 4.8.3 and 4.8.4) without specifying whether it is the Section 106 process or the CEQA process (or both) to which the letters pertain, and this lack of specificity could allow the reader to conclude that the letters include CEQA considerations that are not present.
- Section 4.8.3, Cultural Resources Assessment, pages 4-94 to 4-95. The California Code of Regulations requires that the documentation of a resource being considered for nomination to the California Register of Historical Resources (CRHR) must be updated if it is five or more years old (Cal. Code Regs., tit. 14, § 4852 (e) (3)). If a determination of eligibility more than five years old must be reevaluated, it follows that a determination of ineligibility more than five years old must also be reevaluated. The EIS/EIR document should provide details about when determinations of eligibility for the identified cultural resources were made and cite the forms or reports detailing these resources and determinations. Also, including more details in the EIS/EIR document on the identified resources and the justifications for their eligibility determinations would make the decision-making process regarding cultural resources more transparent.

- Section 4.8.3, pages 4-94 to 4-95. The California Office of Historic Preservation's "Instructions for Recording Historical Resources" (March 1995, p. 10) states that the "responsibility for evaluation must be taken by persons meeting the Secretary of the Interior's Professional Qualifications standards in a discipline appropriate to the history context within which the resource is being considered." The EIS/EIR document should provide details about the qualifications of the person or persons making the eligibility determinations on which is based the conclusion that the project will have no impacts on significant cultural resources. In particular, the EIS/EIR document should include the qualifications of the person, on behalf of the POLB, making the determination that two resources potentially impacted by the project (two abandoned oil wells and the Kinder Morgan Tank Storage Terminal) are not eligible for the CRHR. The two cultural resources persons listed in Appendix H, "List of Preparers," do not appear to meet the Secretary of the Interior's Professional Qualifications standards for evaluating the two cultural resources evaluated by the POLB. The EIS/EIR document should also include a discussion of these two resources and the rationale for their eligibility determinations by the POLB, unless a formal technical cultural resources report was prepared for the project and can be cited as containing the methods used to identify cultural resources and the guidelines used to reach conclusions of CRHR eligibility for each resource that is considered. Section 4.8.3 cites no technical report, and none is included among the DEIS/EIR document references.
- Section 4.8.3, pages 4-94 to 4-95. In our Scoping Comments we asked about the project's impact on historic port facilities. The proposed LNG terminal is planned for Berth T-126 of the former Long Beach Naval Shipyard, built on harbor fill in 1940. Berth T-126 will be massively impacted by this project, but it is not explicitly discussed as a cultural resource in Section 4.8.3. The DEIS/EIR document just notes a 1990s study of the Long Beach Naval Shipyard (no bibliographic citation is provided) as finding that no resources eligible for the National Register of Historic Places (NRHP) were identified on the LNG terminal site. As discussed above, if Berth T-126 is considered ineligible based on that determination for the Shipyard, it needs to be reevaluated now due to the age of that determination. (That may be the case for the two Naval Shipyard buildings still extant at the Berth, as well, even though their demolition is not considered part of the LNG project). Also, cultural resources ineligible for the NRHP may be eligible for the CRHR, so a separate evaluation of Berth T-126 should be made on this basis alone. Berth T-126 may date to 1940 and may be historically significant for World War II (WWII) activities in California or possibly for its construction methods. Berth T-126 should be evaluated by a person who meets the Secretary of the Interior's Professional Qualifications standards for architectural history, is knowledgeable about WWII naval shipyards, and is knowledgeable about CEQA.
- The Los Angeles Refinery Carson Plant (LARC) will also be considerably impacted by this project, entailing the modification of 10-15 acres of industrial land at the

Carson Plant ("Port of Long Beach, Supplemental Notice of Preparation: Modified Proposal for the Management of Natural Gas Liquids Associated with the Long Beach Import Project," November 3, 2004, p. 4). The DEIS/EIR document does not consider any impacts at the LARC in the cultural resources analysis in Section 4.8.3. There are tanks over 80 years old at the nearby Kinder Morgan Tank Storage Terminal, and there may be buildings or other structures older than 45 years at the LARC. The area of the LARC that will be impacted by the LNG project should be evaluated by a person who meets the Secretary of the Interior's Professional Qualifications standards for architectural history, is knowledgeable about the history of California's oil industry and technology, and is knowledgeable about CEQA.

- Section 4.8.3 of the DEIS/EIR document does not specify that local historical registers, listings, or ordinances were accessed during the literature search conducted to identify cultural resources in the vicinity of the project. CEQA specifically states that listing on a local register makes a resource potentially eligible for the CRHR (Cal. Pub. Res. Code § 21084.1), and the California Code of Regulations specifically states that cultural resources designated under municipal or county ordinances may be nominated to the CRHR (Cal. Code Regs., tit. 14, § 4852 (f)). Also, local archaeological and historical societies and museums may have lists of locally recognized historical resources. The EIS/EIR document should reflect that these organizations were consulted and locally listed cultural resources were considered in the analysis of project impacts in order to demonstrate that a thorough attempt was made to identify all the cultural resources that might be affected by the project.
- Section 4.8.4, Unanticipated Discoveries, page 4-95. It is not clear from the DEIS/EIR document's brief discussion of the project's Unanticipated Discovery Plan whether or not the project expects to have pipeline construction monitored by an archaeologist and/or a concerned Native American. While our Scoping Comments asked about the potential impact of underground facilities on unknown cultural resources, the project applicant conducted no current archaeological survey of the underground gas pipeline routes because the lines "would be in areas that have undergone extensive previous disturbance," and "the likelihood that cultural resources would be encountered is considered low" (page 4-94). That expectation may justify not surveying the pipeline routes, but we suggest having archaeological monitors watch pipeline trench excavations to ensure that previously unknown archaeological resources are not unwittingly destroyed.

The Unanticipated Discovery Plan sets forth general procedures to be followed if previously unidentified cultural resources or human remains are encountered during construction (by whom is not specified). The plan itself is not part of the DEIS/EIR document, so it is not known what provisions beyond the general procedures presented in Section 4.8.4 are included, but two possible provisions can be

recommended as fulfilling CEQA provisions for archaeological sites accidentally discovered during construction (Cal. Pub. Res. Code § 21083.2 (i)).

The first is that full-time monitoring by a qualified archaeologist be required where the trenches for the gas pipeline routes are in areas where native soils (not fill) may directly underlie the roads along which the routes run. This recommendation is based on two considerations: the greater probability of prehistoric cultural resources occurring near shorelines, creeks, and channels (most of the gas pipeline routes are of this character), and the understanding that older roads were constructed without concern for archaeological sites, leaving remains of sites under and adjacent to roads.

The second recommendation is that a qualified archaeologist monitor full-time the horizontal directional drilling (HDD) excavations at the Cerritos and Dominguez Channels. This would be advisable for two reasons. First, HDD requires opening deep and extensive entry and exit pits which in and of themselves have the potential to impact archaeological resources, and, again, there is a greater probability of prehistoric archaeological resources occurring near shorelines, creeks, and channels. Second, an archaeologist should examine the material being removed from the drill holes for any traces of cultural materials. While the probability of finding cultural materials at 60 to 90 feet below ground surface in the vicinity of and under the Cerritos Channel is not great, the drilling presents an opportunity for an archaeologist to examine samples from an otherwise unreachable area. Drilling in the vicinity of and beneath the Dominguez Channel will probably be shallower, and this, again, is another area where prehistoric remains are more likely to be found.

The DEIS/EIR document discusses a set of procedures for dealing with the discovery of cultural materials and the project's Unanticipated Discovery Plan adds further steps if human remains are found. The additional steps include consulting with the Native American Heritage Commission (NAHC) and with any tribes the NAHC recommends. The very brief outline of the Plan does not mention that California Public Resources Code Section 5097.98 directs the NAHC to identify a Most Likely Descendant (MLD) when Native American human remains are found, nor does the plan mention the rights of disposition which the MLD is granted by that law. If these steps are not in the Plan, they need to be, along with one further step (if it is not already present): notification of the county coroner. This is required by the California Health and Safety Code, Section 7050.5.

- Section 4.8.5, Impact and Mitigation, page 4-95 to 4-96. Consultation with Native Americans is crucial to a thorough effort to identify and appropriately treat known and previously undiscovered cultural resources. The DEIS/EIR document indicates that the NAHC was contacted, and the Commission responded that there were no known sacred sites in the vicinity of the project and also provided a list of Native American tribes having traditional ties to the project area. The applicant's efforts to

contact these tribes by mail and telephone were rigorous, and one response was garnered. The Gabrieleño/Tongva Tribal Chairperson provided the information that Native American remains have been discovered in "deposits that were considered disturbed," asked about archaeological monitoring on the project, and requested continuing consultation. We recommend that a Native American monitor the construction along the gas pipeline routes and the excavation of the HDD exit pit on the north side of Cerritos Channel and the entry and exit pits at Dominguez Channel, which are the areas with the highest probability for the occurrence of prehistoric Native American deposits. A monitor's presence would likely allay NAHC and tribal concerns, as would reporting the progress of the work to the Gabrieleño/Tongva Tribal Chairperson at roughly two-week intervals.

Air Quality

- Section 4.9.5, Operational Impacts and Mitigation, page 4-118, Table 4.9.5-4. The summary of the air dispersion modeling results provided in Table 4.9.5-4 shows that the nitrogen dioxide (NO₂) emissions from the normal operations at the Long Beach LNG Import Project would come within 22 micrograms per cubic meter (ug/m³) of causing a new impact on the NO₂ 1-hour California Ambient Air Quality Standard. These NO₂ emission impacts are clearly dominated by the marine vessels that would hotel near the LNG facility for unloading. SES states that the marine vessels would be fueled by boil-off LNG to the maximum extent possible and by residual fuel oil No. 6 when necessary (page 4-112, Marine Vessels). The DEIS/EIR document does not state which fuel these marine vessels were assumed to be burning for the air dispersion modeling. A new violation of the NO₂ 1-hour California Ambient Air quality Standard predicted by the air dispersion modeling could have a significant impact on the General Conformity Determination. Table 3-2 (page E-3) in the Draft General Conformity Determination (Appendix E) shows that the nitrogen oxides (NO_x) emissions are within 3.1 tons per year of exceeding the conformity applicability threshold. We recommend that, considering the small margin, the EIS/EIR document make clear the details of the modeling assumptions (emission rates, fuel types, stack heights, stack locations, stack velocities and any other pertinent assumptions made) so that the reader may be confident in the modeling results and the General Conformity Determination.
- Appendix E, Draft General Conformity Determination, page E-5. The DEIS/EIR document states that the Long Beach LNG Import Project would require a permit from the South Coast Air Quality Management District (SCAQMD) and that the permit would suffice to ensure compliance with all SCAQMD rules and regulations. We recommend that SES estimate the need for offset credits given the current cost of NO_x RECLAIM Trading Credits (RTCs) and possible cost of PM₁₀ Priority Reserve Credits (PRCs). These costs can be extremely high and could impact project economics. We further recommend that SES meet with SCAQMD as soon as practical, if the applicant has not done so already, to discuss the availability and costs of RTCs and PRCs.

- Section 4.9.7, Health Risk Assessment, pages 4-119 to 4-121. The Health Risk Assessment of toxic air contaminant emissions presented in Section 4.9.7 was properly conducted to allow the reader to establish whether or not operation of the proposed project would constitute a significant source of cancer-causing and non cancer-causing pollutants in an area where the background levels of such pollutants have been established (and noted on page 4-101) as posing a significant cancer and non-cancer risk using existing assessment methods.

For operational emissions, the results specifically identified the maximum cancer risk (page 4-121) as 1.5 in one million for the maximally exposed resident and 2.5 in one million for the maximally exposed worker. These risk values are significantly below the level specified in the analysis (10 in one million) as significant for such pollutant exposures. The indices of potential significance for non-cancer effects (from short-term or long-term exposures) were similarly estimated to be significantly below the levels Energy Commission staff considers significant for such pollutant exposures. Since the health risk estimates for the project's operational emissions reflect the effectiveness of the proposed control measures, we do not recommend further mitigation for such emissions.

While the potential impacts from the toxic emissions of concern were assessed through the applicable risk assessment process, the analysis omitted a similar focus on the toxic emissions from construction-related sources. We recommend that the EIS/EIR document include a quantitative assessment of the cancer and non-cancer risk from construction-related emissions in addition to the general mitigation measures specifically aimed at these pollutants. Diesel-engine emissions are likely to be the most significant in this regard.

Noise

- Section 4.10, Noise, pages 4-124 to 4-127. The DEIS/EIR document should address hearing protection for construction workers and for facility operators. Note that both federal (Occupational Safety & Health Administration [OSHA]) and state (Cal/OSHA) regulations apply.
- Section 4.10.4, Impact and Mitigation, page 4-125, paragraph 2. The DEIS/EIR document states that construction activities at the LNG terminal site and along the routes of the pipeline and electric distribution facilities would generate short-term increases in noise levels during daylight hours, when construction activities would occur. Although the FERC does not regulate construction noise and the City of Long Beach Municipal Code exempts construction noise in the POLB, portions of the natural gas and ethane pipelines would be located in the cities of Los Angeles and Carson. The EIS/EIR document should specify if there are limitations on the hours of construction set forth by either the City of Los Angeles or Carson municipal codes. If yes, then the EIS/EIR document should include a condition restricting project

construction hours to those specific times of day, in compliance with the applicable code or codes.

Reliability and Safety

We offer the following general comments on Section 4.11 and Appendix F of the DEIS/EIR document. These comments are followed by page specific comments.

- The selection of scenarios that could lead to an LNG release is flawed and therefore underestimates risk. The DEIS/EIR document rules out many scenarios that have been analyzed at other LNG sites and which scientists at Sandia National Laboratories have deemed as credible. It bases its rejection of scenarios, such as a tanker release while berthed, on probability. Although probabilities based on historical events at LNG facilities may be acceptable for accidental releases, they are not appropriate for intentional (e.g., terrorist-based) releases. The DEIS/EIR document derives the probability of an LNG release at berth based on an incorrect assumption that all hazardous/flammable chemical facilities are equivalent terrorist targets.
- The DEIS/EIR document uses a thermal radiation level that does not ensure the safety of all populations. The use of a 1600 Btu/hr-ft² level does not constitute the level at which the public would feel no impacts. Rather a 450 Btu/hr-ft² level should be used, which would then be equivalent to the “no observable effects level” that the Energy Commission uses in the siting of power plants.
- The evaluation of the effects of an LNG release on neighboring facilities is flawed. The DEIS/EIR document states that there would be no effect on neighboring facilities because the 10,000 Btu/ft²-hr thermal radiation level (which would impact steel) does not extend to those facilities. However, this level does encompass many critical areas of the LNG facility itself, such as the LNG storage tanks and the LNG tanker. An LNG release and fire would almost certainly impact these areas of the LNG terminal and would likely cause cascading fires, which would then impact neighboring facilities.
- Critical information is missing from the DEIS/EIR document. A key report that is not provided is the WSA that would evaluate the safety of tankers in port and any impacts to petroleum or other vessels as well as what safety and emergency response measures may be required. Such information is pertinent in assessing the impacts of foreseeable activity connected to the proposed LNG terminal. Failure to include the WSA renders the DEIS/EIR document as lacking a complete assessment of all connected actions or indirect impacts as required by NEPA and CEQA. 40 C.F.R. § 1502.16(b), Cal. Code Regs., tit. 14, § 15126.2(a)

There are other plans that are also lacking, such as the Cost Sharing Plan for funding of security/emergency management costs that would be imposed on state

and local agencies that is to be included in the Follow-on WSA and the Emergency Response Plan (including evacuation plan) which is to be submitted before initial site preparation. Since such plans are required as mitigation for safety risks, such plans should be included in a supplemental and/or recirculated DEIS/EIR document. Lacking information on key mitigation measures, particularly ones that are of concern to the public, makes the DEIS/EIR document fall short of meeting the informational requirements of NEPA and especially of CEQA. CEQA specifically does not allow for formulation of mitigation to be deferred until after a project is approved. Cal. Code Regs., tit. 14, § 15126.4(a)(1)(B).

- The DEIS/EIR document does not define where an LNG vapor cloud may travel to onshore. The rationale is that there are many ignition sources onshore and it was outside the scope of the study to identify them. However, almost all other LNG impact assessments provide this information.
- The DEIS/EIR document does not appear to model releases of LNG containing heavier hydrocarbons nor does it model a release of chemicals from the natural gas liquids processing area. Although SES states that they will use "lean gas" (not defined), no estimate of the amount of heavier hydrocarbons is provided. The document needs to specify how heavier hydrocarbons are accounted for in the modeling of thermal radiation and vapor dispersion effects and how heavier hydrocarbons would affect overpressure.

Appendix F indicates that "the majority of the large releases identified in this work resulted in vapor clouds composed primarily of methane, defined as a low reactivity material." The document should discuss whether any of the modeled process leaks involve C₂ or other heavier hydrocarbons. The discussion of the process release modeled at location F should indicate whether high or low reactivity material was assumed.

- The definition of "public" is unclear and possibly inappropriate. The definition appears to be individuals located outside of the Port of Long Beach. However, as noted in Appendix F, the Port of Long Beach has estimated that a maximum of 900 workers might be within the 0.8 mile radius circle around the LNG terminal at any one point in time (S. Crouch, POLB). As noted in the Safety Advisory Report submitted by the Energy Commission staff to the FERC, within one mile of the LNG terminal there is an average daytime worker population of approximately 2000 in addition to fully staffed public safety facilities operating 24 hours per day seven days a week. The Gerald Desmond Bridge, one of three bridges that allow access to Terminal Island, is also less than one mile from the site. The bridge carries approximately 53,000 vehicles per day.

These workers and members of the public are not associated with the LNG facility and should be considered collectively as the public. Hazard zones could easily

extend to these populations. The maximum distance to the 1600 Btu/ft²-hr thermal radiation levels for a release from an LNG ship at berth is 3365 feet and the maximum distance resulting from a truck bomb adjacent to a storage tank is 7020 feet. The FERC has concluded that releases from a docked LNG ship or a truck bomb are not credible; however, as noted below, the Energy Commission believes such events should not be dismissed. At a minimum, the distance resulting from a rupture of process equipment (which FERC believes to be credible) is clearly well outside the LNG terminal site.

- All the figures showing the LNG terminal facility should clearly identify the facility boundaries (e.g., dark outline). The figures do not currently provide clear demarcation.
- Hazards from an LNG vessel traversing the coast or near Catalina Island are not evaluated.
- The safety and hazards analysis should be independently reviewed by Sandia Laboratories. Substantial knowledge has been gained recently from the reevaluation by Sandia and the Cabrillo Port LNG Deepwater Port DEIS/EIR preparers regarding the safety hazards of LNG releases. This knowledge should be applied to the Port of Long Beach LNG Import Project EIS/EIR document through an independent evaluation by Sandia.
- It is unclear what and how security measures undertaken by local agencies will be funded and there is no discussion of security measures in the DEIS/EIR document. While the document states that security measures imposed on local agencies will be funded by SES, no definition or mechanism for "imposition" is provided. The document should clarify whether measures not imposed but felt to be critical by local agencies will be funded. This information must be provided to local agencies and the public for their evaluation.

The following are our page specific comments on Section 4.11 of the DEIS/EIR document.

- Section 4.11, page 4-128, paragraph 3. The DEIS/EIR document states that results from the FERC's spill analysis of vessel incidents are to be used for "establishing potential impact areas for emergency response and evacuation planning." Assuming an impacted population ends abruptly at the 1,600 Btu/ft²-hr thermal radiation endpoint does not provide sufficient information for the City of Long Beach police and fire departments which must prepare plans to ensure the safety of all populations.
- Section 4.11, page 4-128, paragraph 5. LNG storage tank impoundments are sized for catastrophic failure (i.e., 110 percent of the tank capacity). By requiring that an

impoundment hold an entire tank release, it appears clear that regulators were making provisions for a total release. FERC should not dismiss an entire tank release as not credible since such a release is considered in design requirements.

- Section 4.11.1, Significance Criteria, page 4-128. In general, CEQA requires identification and mitigation of any potentially significant impacts associated with a proposed project. The criterion typically used in evaluating hazardous materials management is that either a worst case event would cause no impacts to the public or the risk of impact is low enough to be considered acceptable. Any plausible adverse impact on public health must be viewed as potentially significant. It is not acceptable to arbitrarily decide what level of adverse impact is acceptable, as FERC has done in the DEIS/EIR document by selecting a 1600 Btu/ft²-hr thermal radiation endpoint. Similarly, it cannot be assumed that any level of adverse impact is acceptable without implementation of all feasible mitigation measures.

Risk is a function of both probability of occurrence and potential for consequence. The probability of occurrence typically deemed acceptable for an expected number of fatalities is 1×10^{-4} divided by the number of fatalities expected for the event. Thus, the acceptable probability of occurrence for an event with the potential to cause up to 10 fatalities is 1×10^{-5} , and 1×10^{-6} with a potential for up to 100 fatalities, and 1×10^{-7} for up to 1000 fatalities, and 1×10^{-8} for up to 10,000 fatalities. The DEIS/EIR document fails to quantify risk because it uses a distance to a radiant heat exposure level that is arbitrarily deemed acceptable, and then uses a probability of occurrence of 1×10^{-6} , without consideration of the potential for consequence. A scenario involving an internal capture of an LNG carrier and use of it to attack a target such as the Queen Mary would pose a potential to cause between 1000 and 10,000 fatalities. It is not justifiable to suggest that a probability of occurrence of 1×10^{-6} is acceptable for such an event. The generally accepted probability for such a high consequence event would be 1×10^{-8} per year.

- Section 4.11.5, Vapor Dispersion Exclusion Zone, page 4-141. The FERC should provide a table for vapor exclusion zone distances as was done for thermal exclusion zone distances (Table 4.11.5-2, Thermal Exclusion Zones).
- Section 4.11.7.2, LNG Vessel Transit in the POLB, page 4-151, paragraph 1. The EIS/EIR document needs to show shipping routes identified in the text, including distances to Catalina Island. Figure 3-2 in Appendix F provides some but not all of this information. The new map should also indicate where the Coast Guard and tugs would meet the ship.
- Section 4.11.7.2, page 4-151, paragraph 3. The statement that “the watchstanders in the pilot station have a clear view from Pier T, through the West Basin, the western inner anchorage, and the entire Long Beach Main Channel to the Queens Gate entrance,” should be qualified to reflect that weather conditions would affect visibility.

As noted on page 4-154, "reduced visibility due to fog and haze is a characteristic of the POLB, although it can be very localized."

- Section 4.11.7.2, page 4-152, paragraph 4. The statement that the wind climate of the port area is different from and more predictable than that offshore needs substantiation.
- Section 4.11.7.2, page 4-153. Figure 4.11.7-1 should show the security zone around the ship while unloading. The text on page 4-152 indicates that there will be a security zone during unloading operations. This zone is presumably at least 500 yards around the vessel. We suggest providing a distance scale for Figure 4.11.7-1.
- Section 4.11.7.3, LNG Ship Safety, page 4-156, paragraph 4. The statement that "For 30 years, LNG shipping operations have been safely conducted in the United States..." is true but misleading since for most of this period there was no shipping due to an economic downturn in the U.S. LNG market. This is clear from the 750 cargo deliveries (derived from the 1500 voyages to or from the U.S.) to-date of which 204 were in 2003.
- Section 4.11.7.3, page 4-161, paragraph 2. The EIS/EIR document should explain where the value "1,920 meters" comes from.
- Section 4.11.7.3, page 4-161, paragraph 3. The text should reflect the thermal radiation level range for all hole sizes modeled (1.0, 2.5, 3.0 and 3.9 meters) and not just for the 2.5 meter and 3.0 meter hole sizes. The range should therefore be 2,212 to 5,536 feet.
- Section 4.11.7.3, page 4-161, paragraphs 3 and 4. The EIS/EIR document should explain why different meteorological conditions were used for the thermal radiation and vapor dispersion modeling. We recommend also comparing these assumptions with those used by Quest in Appendix F.
- Section 4.11.7.3, Requirements for LNG Ship Operations, pages 4-163 to 4-164. The WSA is critical to the evaluation of the risks of the tanker while in port. Having SES submit a preliminary and Follow-on WSA prior to issuance of the final EIS/EIR document requires recirculation of a revised DEIS/EIR document or a supplement that assesses the additional information and allows for additional public review and comment on this issue. 40 C.F.R. § 1502.9(a); Cal. Code Regs., tit. 14, §§ 15162, 15163. The WSA is especially important for evaluating the potential for collisions with other vessels.

The WSA is also needed to evaluate security requirements imposed on local agencies. As noted on page 4-164, "the potential costs [of security] will not be known until the specific security levels have been identified, and the responsibilities of

federal, state, and local agencies have been established in the Coast Guard's WSA." The Coast Guard must provide a Letter of Recommendation to the FERC regarding the WSA; however, no timeframe for this submittal is provided.

- Section 4.11.7.4, page 4-164. On this page and in several other locations in the DEIS/EIR document, agencies are assured that SES will fund all project-specific security/emergency management costs that would be imposed on state and local agencies. The EIS/EIR document should define what is meant by "imposed." Does this preclude funding for costs that local agencies or the state believe appropriate but are not "imposed"?
- Section 4.11.7.4, page 4-164. The DEIS/EIR document indicates that a comprehensive plan identifying the mechanisms for funding security/emergency management costs should be included in a Follow-on WSA for the project which would be submitted before the final EIS/EIR document is issued. Since this plan is being used to mitigate safety risks, a draft should be made available in a supplemental and/or recirculated EIS/EIR document.
- Section 4.11.8, Terrorism and Security Issues, pages 4-165 to 4-167 (and Appendix F, page 3-13). Since the events of September 11, 2001, any assessment of the impacts of a release of hazardous materials or the safety and of the reliability of an energy-related project should include a comprehensive security assessment including an intentional attack (from any number of parties, including terrorists) on the facility and subsequent effects resulting from a release and fire. An intentional attack could render control systems and measures inoperable. Emergency response may be unavailable. Criticality Assessments, Threat Assessments, Vulnerability Assessments, which have in the past been applied to national security facilities, should be evaluated in the context of the LNG terminal and tanker.

A Criticality Assessment would provide an evaluation of the on-site, off-site and up-stream components that were of the highest necessity for maintaining safety and reliability. These components could be key storage, transfer, shut-off, or detection devices whose presence and location dictate the safety and reliability of the project. For example, power supplied to the facility via overhead power lines could fail due to accidental causes or due to sabotage/terrorist actions. Emergency shut-off valves could fail even if they are designed to fail in the closed position due to malfunction or damage and emergency communications could fail as well. Safety systems may not work as designed, emergency responders may not work in unison as planned and back-up control and containment systems may fail.

The DEIS/EIR document discussion on security does not mention a Criticality or Threat assessment. Appendix F, while providing some system failure data in Tables 2-2, 2-8, and 3-1, eliminates Critical Energy Infrastructure (CEII). This information

should be available to state and local agencies so that they can meet their responsibilities to protect the public.

Security is a critical component of the safety and reliability of this project and the DEIS/EIR document should include a discussion of the critical components and the threat presented to the continued operation of these components before the facility can be determined to be as safe as possible. Without this analysis, the DEIS/EIR document is inadequate.

While section 4.11.8 is for the most part complete in stating that threats will be assessed and a security plan will be prepared and implemented as per 49 C.F.R. Part 193, subpart J and 33 C.F.R. Part 105, it is unknown what the security will be and how it will be addressed. Although it is reasonable that a security plan will not be prepared prior to project approval and operations, Criticality and Threat Assessments can be prepared now as a means of evaluating the risk of an intentional attack upon the proposed LNG facility and off-site linear facilities.

The U.S. Department of Energy (DOE) guidelines (June 30, 2002 Office of Energy Assurance) state, in part, that the benefits of conducting threat and vulnerability assessments include:

- building awareness of risks, vulnerabilities, and mitigation options with awareness being one of the least expensive and most effective methods for improving a facility's overall security, and
 - categorizing key assets that drive risk management.
- The section of the DEIS/DEIR document on terrorism and security risks should include not only analysis of threats to the LNG terminal itself, but also terrorism and security risks caused by use of LNG tankers. For instance, as stated in Section 2.0, pages 2-1 to 2-31, the LNG carriers are a separate part of the project and SES will not have responsibility for the sailing, management, or security of the ships, or the screening or safety training of their crews. Nevertheless, the foreseeable activities of LNG carriers are connected actions to the proposed LNG terminal and their foreseeable effects must be assessed under NEPA and CEQA. The LNG ships can present security risks to the public and the environment and the omission of any discussion of a potential take-over of the ship by a terrorist group leaves the public with an unrealistic sense of the risks presented by the project. Use of an LNG ship as a weapon would clearly mimic the events of September 11, 2001 and should be examined in criticality, threat, and vulnerability assessments. The statement in the DEIS/DEIR document that such an attack is improbable is unsupported. A Criticality Assessment and a Threat Assessment would specifically evaluate the threat of such an event and must be included to provide both the public and decision makers with information necessary to their analysis. The potential concerns associated with a

terrorist takeover of an LNG carrier are described in detail in our comments regarding the Hazards Analysis (Appendix F).

Having control over the LNG supply, the port facilities, the LNG carriers, and the carrier crews, is a major aspect of security that is not adequately addressed in discussing the Long Beach LNG Import Project's operation. The delivery of cargoes by shipping companies that operate out of locations such as Indonesia poses a potential security risk. Failure to discuss the operation of the LNG carriers with respect to environmental impacts and public safety is a major deficiency in the DEIS/EIR document under NEPA and CEQA.

- Section 4.11.9, Emergency Response and Evacuation Planning, page 4-167, paragraph 3. The DEIS/EIR document states that the worst-case scenarios evaluated for the onshore facility and for marine spills provide guidance on the maximum extent of potential hazards. This is not the case since the more protective thermal radiation flux level was not used and the thermal radiation levels were not calculated from the edge of the vapor dispersion cloud.
- Section 4.11.9, Emergency Response and Evacuation Planning, page 4-168. The DEIS/EIR document states the evacuation routes and an emergency response plan (including evacuation) would have to be submitted before "initial site preparation." Since evacuation is an important mitigation for safety risks and since questions have been raised regarding the feasibility of evacuation, the evacuation routes and emergency response plan should be included in a supplemental or recirculated DEIS/EIR section on public safety.
- Section 4.11.10.1, Selection and Probability of LNG Release Events, page 4-170. The DEIS/EIR document identifies five tasks that Quest Consultants Inc. (Quest) was to undertake, including identifying a range of potential releases (including terrorist-induced releases) that could result in the largest hazardous conditions outside the import terminal site boundary, and calculating or estimating the probability of each release event. It appears that certain scenarios were eliminated based on probability; not all of the scenarios identified are presented in Section 4.11. To be the informational document intended under NEPA and CEQA, the DEIS/EIR should present the full range of potential releases assessed and their probabilities as calculated by the consultant.
- Section 4.11.10.1, page 4-170. The DEIS/EIR document states that all terrorist-induced releases are considered improbable (would not occur for 10,000 years) yet the Sandia National Laboratories Report (SAND2004-6258) clearly identifies several terrorist scenarios as credible. This classification is based on a mistaken use of probability and is contrary to other statements in the DEIS/EIR document. For example, on page 4-195, the document states that "unlike accidental causes, historical experience provides little guidance in estimating the probability of a

terrorist attack on any LNG vessel or onshore storage facility.” Any estimate of probability of a terrorist event is questionable and must not be used to determine what scenarios will be modeled and what resulting information will be provided to decision makers and the public.

- Section 4.11.10.1, page 4-170. The DEIS/EIR document does not acknowledge the plausibility of internal attack and subsequent use of an LNG carrier as a potential weapon to attack other nearby high profile targets such as the Queen Mary. Therefore, no analysis of the probability of such an event was developed or presented. In light of the past record of internal attacks carried out by terrorists, such an event should be considered in the EIS/EIR document.
- Section 4.11.10.1. The DEIS/EIR document does not assess the critical components and the threat – external and internal – against each component. One cannot therefore predict the likelihood or intensity of on-site or off-site impacts until criticality and threat assessments are completed as part of the DEIS/EIR process and until state and local government agencies are given access to these assessments.
- Section 4.11.10.2, Consequence Analysis Results for Possible LNG Release Events, pages 171 to 177. The analysis of potential consequences is flawed as a result of failure to consider the possibility of internal attack and use of an LNG carrier. It was postulated that only a high-speed collision involving a very large external vessel would cause a full-scale release of the LNG cargo and assumed that it could only occur outside the port and at a considerable distance from populated areas. However, if a terrorist group were to obtain control of an LNG carrier it could be directed at any target and a full-scale release could be planned to occur at a target location (see comments on Appendix F).

The assumption that an attack could only occur outside the port precludes consideration of potential exposure of the public to the consequences of a major LNG release. However, significant public exposure would result if a full release did occur, for example, in close proximity to a populated area of the coast.

It should also be noted that the assumption of a 20-minute release duration reduces the potential pool size that would result from a full carrier release of shorter duration. It is conceivable that an internal attack could result in a more rapid release, perhaps in the range of 5 minutes. Since there is no basis to reject a shorter duration, the EIS/EIR document should include analysis using a range of assumed values.

- Section 4.11.10.2, page 4-175. The DEIS/EIR document states that the largest distance to 1.0 psig (pounds per square inch gauge) explosion overpressure for a process equipment release is 320 feet. The EIS/EIR document should discuss how this would affect adjacent equipment on the LNG terminal site.

- Section 4.11.10.2, page 4-178. Quest's evaluation of the effects of LNG releases on neighboring facilities does not address the effect of a release on adjacent facilities within the LNG terminal site. If there is a release from process equipment and a subsequent fire, the EIS/EIR document should discuss the damage that would occur to the adjacent tanker and storage tanks (e.g., as shown on Figure 4.11.10-6). This figure shows that one LNG storage tank and part of the LNG ship are within the 10,000 Btu/ft²-hr radiant vulnerability zone from a fire caused by a release from process equipment at location F. Given that Appendix F states that "all the large releases involving LNG have the potential to last from tens of minutes to several hours..." and that exposure to the 10,000 Btu/ft²-hr for several minutes would damage steel structures (as noted on page 4-178), it appears that a release of LNG and subsequent fire has the potential to affect other structures and pipes associated with the LNG terminal. These releases in turn would be much more likely to affect neighboring facilities. Therefore, the EIS/EIR document should first evaluate whether adjacent on-site structures would fail and the likely effects from such failure. This information (location and size of fire) should then be used to evaluate effects on neighboring facilities.
- Section 4.11.11, LNG Truck Safety, pages 4-185 to 4-188. The DEIS/EIR document describes truck transportation of LNG for use in motor vehicles. However, it does not include a site-specific analysis of the risk associated with such transportation. While the DEIS/EIR document does provide some analysis of accident rates, it does not include any analysis of the potential consequences of an accidental LNG release from trucks hauling the LNG from the proposed project. Major releases of hazardous materials from trucks are typically associated with high-speed accidents, collisions with other heavy duty vehicles, and accidents between the trucks and trains. In light of the existing heavy duty truck traffic associated with the port and the potential for the project increasing truck traffic levels, the DEIS/EIR document should include an analysis of an accidental release of the entire contents of an LNG truck. This analysis should address both the subsequent formation of an LNG cloud and pool fire along proposed truck transportation routes through densely populated areas, and in areas with large vehicle user populations, such as freeways during times of high traffic congestion.
- Section 4.11.11, page 4-187. The DEIS/EIR document suggests that the risk associated with truck transportation of LNG from other proposed projects posed a risk of significant impact, and that mitigation measures were implemented to reduce the risks associated with truck transport of LNG associated with those projects. Because the DEIS/EIR document failed to include a site-specific analysis of the risk associated with the proposed project, no significant impact from truck transportation of LNG was identified. It is possible that such an analysis will suggest that there is a potential for significant impact. Therefore, the EIS/EIR document should include a site-specific risk analysis of potential impacts associated with truck transportation of

LNG from the terminal and provide mitigation measures to avoid or reduce these risks.

- Section 4.11.11.3, LNG Truck Accident History, page 4-188. We suggest updating the discussion of LNG truck accidents by including the recent LNG truck fire in Nevada that occurred on September 15, 2005. The cargo of an LNG tanker truck caught fire on a stretch of Interstate Highway 80 about 30 miles east of Reno, causing the highway to be shut down in both directions and residents and businesses within a one-mile radius were evacuated.
- The EIS/EIR document should model a BLEVE (boiling liquid expanding vapor explosion) and subsequent fire associated with an LNG tanker truck. The 2002 explosion of an LNG tanker truck in Spain indicates that the potential for boiling liquid expanding vapor explosions should be addressed.
- Section 4.11.12.2, Pipeline Accident Data, page 4-193. The value of the data provided in Tables 4.11.12-2 and 4.11.12-3 would be increased by providing similar information from the period 1986-2003.

Appendix F: Hazards Analysis of a Proposed LNG Import Terminal in the Port of Long Beach

- Section 1.1, page 1-1. The text states that “a portion of the LNG may have to be processed to reduce the amount of the heavier hydrocarbon components of the fluid...” This implies that a portion of each shipment could require processing. Does this suggest that the LNG tanker would pick up LNG from various sources that differ in gas quality and that different sources of LNG would be stored in different tanks on the vessel?
- Section 1.2, Scope of Study, page 1-4. The scope of the hazards analysis (Quest study) conducted by Quest omits critical scenarios, in particular the use of an LNG tanker as a weapon. The worst-case event associated with this project would be much more serious under this type of scenario than those identified in the Quest study. The LNG vessels are an integral part of this project and would be a serious threat if they were controlled by terrorists and allowed to approach a heavily populated area of the California coast such as Long Beach or Los Angeles. This type of scenario cannot be dismissed on a statistical probability basis without identification of highly effective mitigation measures. Because analysis of this type of event was precluded by the scope of the Quest study, no mitigation measures or alternative project proposals addressing a terrorist attack utilizing the LNG vessels as weapons were described in the DEIS/EIR document.

Another uncertainty regarding assigning risk of a terrorist attack utilizing an LNG vessel is the control of crews operating the ships. If crews are drawn from areas

where there are high levels of terrorist presence, it would increase the risk of terrorist infiltration of the ships' crews and the probability of a terrorist incident involving an LNG vessel.

- Section 1.2, page 1-4. Without an assessment of the critical components and the threats against them, it cannot be determined what would be the "worst case" event associated with this project. A concerted attack on control systems, the pipeline, and the LNG tanker could result in the release of the entire contents of the ship, the land storage tanks, and the C₂ pipeline at the same time. Emergency response personnel would not be able to control such events. This scenario is more serious than those identified in the Quest study and security of the pipeline and other critical components are not discussed in the DEIS/EIR document.
- Section 1.3, Limitations of Study, page 1-4. The Quest study states that it includes analysis of a "range of the largest accidental and intentionally-induced releases that could occur" and that "Essentially, because the study evaluates a set of representative worst-case impacts, the consequences of any event that was not specifically identified could still be expected to fall within the range described in this study." However, the location of any release must be considered when evaluating consequences. While the amount of material released and subsequent fire or vapor dispersion may be the same, impacts from a release could be of greater severity if located near a populated area.
- Section 1.3, page 1-4. The last paragraph states that "no use of proprietary, confidential, or not-to-be-publicly-disclosed information was used in this study." This statement is contradicted several times on subsequent pages of Appendix F (e.g., pages 2-5, 3-5, 4-10, etc.). Confidential information was used, which should be made available for review by appropriate government agencies under a non-disclosure agreement.
- Section 2.2.3, Hazard Endpoint Criteria, page 2-2. In evaluating the potential for adverse impacts on surrounding populations, Table 2-1 provides for use of a criterion of 1600 Btu/hr-ft² to evaluate public "radiant heat exposure". However, it is inappropriate to use an exposure criterion that implicitly accepts the potential for adverse impacts on the exposed public. Public exposure criteria should reflect a level of exposure that is without adverse impact, taking into account the potential variability of sensitivity in the potentially exposed population. At an exposure level of 1600 Btu/hr-ft², first-degree burns would occur within 20 seconds, second-degree burns would occur within 30 seconds, and third-degree burns would occur within 50 seconds with a 1 percent fatality rate. Typically, exposure criteria are based on a No Observed Adverse Effect Level (NOAEL) divided by a safety factor that is based on the uncertainty associated with extrapolating from the experimental data to the exposed population. An exposure criterion that is consistent with use of a NOAEL, reflecting the susceptibility and limitations of children and the elderly to escape, is

450 Btu/hr-ft². At this level of exposure, no injury would occur with extended exposure. The DEIS/EIR document must assume that members of the public exposed to levels above the NOAEL could experience lesser but still significant impacts. The fact that the 1600 Btu/hr-ft² criterion is suggested in NFPA 59A is not a justification for its use in a CEQA or NEPA analysis as a basis to conclude that a project poses no potential for significant impact. Any safety code must be considered a minimum level of protection and must be evaluated for its applicability in each specific circumstance. While the NFPA criterion may be acceptable in an industrial setting for accidental exposure of trained adult healthy workers, it is not an acceptable public exposure criterion.

For purposes of determining the potential area that could be impacted by an incident such as an LNG release, it is first necessary to develop a de-minimus public exposure criterion. A de-minimus criterion is an exposure level that is low enough to be considered safe. Normally, such criteria are established by determining an exposure level that results in no observed adverse effect (NOAEL) and then dividing that exposure level by a safety factor to reflect uncertainties in extrapolating from the experimental exposure data used to derive the NOAEL to the potentially exposed population. This is not the same process used in deriving an exclusion zone such as the one developed by the NFPA for use in siting LNG facilities. Exclusion zones are areas where no public occupancy beyond that necessary to operate the facility should occur. In essence, these are areas where it should be assumed that serious impacts should be expected. Because it is typically necessary for either the project developer or a government entity to purchase and or limit all access to the property within the exclusion zone it is prudent to balance risk against costs in establishing exclusion zones. This is not the same as establishing a de-minimus criterion, which would result in a much larger delimiting distance and a much larger study area. It appears that the DEIS/EIR document fails to use the exclusion zone criterion as it was intended and instead misuses it as a de-minimus exposure criterion. The DEIS/EIR document does not include an adequate discussion of a proposed exclusion zone for the project. It further incorrectly suggests that exposures to the public beyond the delimiting distance defined by NFPA exclusion zone criterion are without potential for significant impact.

FERC relies exclusively on the thermal radiation levels identified in NFPA 59A. NFPA 59A was recently updated. As part of the update process, a suggested revision to the thermal radiation flux levels was submitted by Robert Bourke, Northeastern Regional Fire Code Dev.⁴ This revision would have changed the thermal flux levels as follows:⁵

⁴ National Fire Protection Association, Report of the Committee on Liquefied Natural Gas.

⁵ For purposes of comparison, the thermal radiation received from the sun at noon in summer is 1.2 kW/m² and the minimum to cause pain after 1 minute is 2.1 kW/m².

Flux		Exposure
Btu/hr/ft ²	kW/m ²	
1600 <u>800</u>	5.0 <u>2.5</u>	A property line that can be built upon for ignition of a design spill
1600 <u>800</u>	5.0 <u>2.5</u>	The nearest point located outside the owner's property line that, at the time of plant siting, is used for outdoor assembly by groups of 50 or more persons for a fire in an impounding area
3000 <u>800</u>	9.0 <u>2.5</u>	The nearest point of the building or structure outside the owner's property line that is in existence at the time of plant siting and used for as assembly, educational, health care, detention and correction, or residential occupancies for a fire in an impounding area
10,000 <u>1600</u>	30.0 <u>5.0</u>	A property line that can be built upon for a fire over an impounding area

The following substantiation was provided for the suggested revision:

“According to a report prepared by ABS Consulting for the Federal Energy Regulatory Commission (FERC), thermal radiation flux from fire of 1600 Btu/hr/ft² (5 kW/m²) will cause first degree burns in 20 seconds, second degree burns in 30 to 40 seconds and third degree burns (1% fatality) in 50 seconds [see report titled: Consequence Assessment Methods for Incidents Involving Releases from Liquefied Natural Gas Carriers - Table 2.6 Effects on People for 1600 Btu/hr/ft² (5 kW/m²) Thermal Radiation]. The radiant heat at these levels are unacceptable and would prevent adequate time for evacuation of persons being exposed at the property line or outdoor assembly by groups of 50 or more persons. It may be an acceptable level of risk for an employee of a LNG facility, where the employee is aware of the risks, but not for unaffiliated persons. The level of 800 Btu/hr/ft² (2500 W/m²) is derived from a recommendation in the SFPE Handbook of Fire Protection Engineering 2nd Edition that establishes a tolerance limit for exposure to radiant heat of 2.5 kW/m² or 2500 W/m² (see page 2-114).”

The suggested revision was rejected by the NFPA Committee. As the rationale for rejection, the committee relied on a white paper by Dr. Phani Raj. This paper states that:

“Table 2 [reproduced below] shows the different levels set by various regulatory and standards setting agencies that are concerned with public safety. It is seen the public exposure hazard threshold is universally set at about 5 kW/m² level.” (emphasis added).”

Agency	Reference	Acceptable Heat Radiation Flux for Public Exposure		Duration of acceptable exposure (seconds)
		kW/m ²	Btu/hr ft ²	
National Fire Protection Association	§2.2.3.2, NFPA/ANSI 59A Standard (2001 Edition)	5.0	1,600	Not specified
U.S. Department of Transportation	49 C.F.R. 193.2057	5.0	1,600	Not specified
UK Health & Safety Executive	http://www.HSE.gov.uk/offshore/strategy/effect.htm ("Fire Effects")	5.0	1,600	Not specified
Austrian Government	http://www.env.cz/www/Phare-CZ02-06-01.nsf/0/c0ec8e357154c5bbc1256df80052498d/\$FILE/RecommendationLUP_ENGLISH.doc "Recommendation of the Austrian Permanent Seveso Working Group for the calculation of appropriate distances for the purposes of Land Use Planning, Emergency Planning and Domino Effects, November 2002."	4.5	1,425	20 second exposure for blistering to begin
State of New South Wales, Australia	http://www.aidgc.com/AIDGC%202003%20Sylvester.pdf (SEEP Regulation # 33)	4.7	1,490	Not specified

However, **ALL FIVE** citations provided in the above table to justify continuation of the 5 kW/m² standard either refer back to the original NFPA 59A standard or do not, in fact, stipulate a 5 kW/m² standard.

The first Agency listed is the National Fire Protection Association and the 2001 Edition of NFPA 59A. This entry is essentially the NFPA saying that it is justified in continuing to use the 5 kW/m² standard because it is already using it.

The reference to the U.S. Department of Transportation simply refers back to the NFPA 59A standard. 49 C.F.R. 193.2057 states:

"Each LNG container and LNG transfer system must have a thermal exclusion zone in accordance with section 2–2.3.1 of ANSI/NFPA 59A with the following exceptions:..."

The U.K. reference is not to a standard at all, but rather to a general discussion of fire effects, wherein it is stated that "escape is assumed at 5 kW/m²."⁶ This statement is contained in the Health Safety Executive (HSE) webpage, which

⁶ <http://www.hse.gov.uk/offshore/strategy/effects.htm>

indicates that the HSE are responsible for the regulation of almost all the risks to health and safety arising from work activity in Britain. That is, they regulate workplace safety to employees and not safety for the general public. Safety standards for public exposure are almost always more restrictive than standards for worker exposure.

The Austrian standard specifically identifies a land use planning standard of 2.0 kW/m², and a “domino-effects” standard of 5 kW/m² for existing situations that cannot be remedied by land-use planning. Obviously, the location of a new LNG terminal would clearly require use of the land-use planning standard.⁷

The New South Wales reference (actually incorrect, since it should refer to SEPP 33 rather than SEEP 33) does not specify a standard at all but rather states that “A person who proposes to make a development application to carry out development for the purposes of a potentially hazardous industry must prepare (or cause to be prepared) a preliminary hazard analysis in accordance with the current circulars or guidelines published by the Department of Planning and submit the analysis with the development application.”⁸

There are a number of very credible organizations that use the more protective standard of 450 Btu/hr-ft² (1.5 kW/m²). In the United States, 24 C.F.R. Part 51 C, Section 203 outlines safety standards to be used in determining the acceptable separation distance of a proposed Housing and Urban Development (HUD) - assisted project from injury.⁹ This section states that “the allowable thermal radiation flux level for outdoor, unprotected facilities or areas of congregation shall not exceed 450 BTU/sq. ft. per hour.”

In a recent report prepared by researchers at Texas A&M University, Mary Kay O'Connor Process Safety Center, Chemical Engineering Department, the following information about the European Union Standard 1473 is presented:¹⁰

⁷ Recommendation of the Austrian Permanent Seveso Working Group for the calculation of appropriate distances for the purposes of Land Use Planning, Emergency Planning and Domino Effects
[http://www.env.cz/www/Phare-CZ02-06-01.nsf/0/e7d55c9a1ff91616c1256dc000430c31/\\$FILE/RecommendationLUP_ENGLISH.doc](http://www.env.cz/www/Phare-CZ02-06-01.nsf/0/e7d55c9a1ff91616c1256dc000430c31/$FILE/RecommendationLUP_ENGLISH.doc)

⁸ New South Wales Consolidated Regulations, State Environmental Planning Policy 33, Hazardous and Offensive Development, Section 12,
http://www.austlii.edu.au/au/legis/nsw/consol_reg/seppn33aod721/s12.html

⁹http://a257.g.akamaitech.net/7/257/2422/12feb20041500/edocket.access.gpo.gov/cfr_2004/aprqr/pdf/24cfr51.203.pdf

¹⁰M. Sam Mannan, Jane Y. Wang, and Harry H. West, Mary Kay O'Connor Process Safety Center, Chemical Engineering Department, Texas A&M University System,
<http://www.touchbriefings.com/pdf/1482/mannan.pdf>

“The European regulation EN 1473:1997 defines the maximum allowable incident thermal radiation flux at the LNG property boundary as 5 kW/m² for urban areas. However, the lower European allowable thermal radiation level is 1.5 kW/m² for ‘critical areas’, i.e. areas that are difficult to evacuate on short notice.”

This report¹¹ also states that “the Society of Fire Protection Engineer’s (SFPE’s) handbook of fire protection engineering, second edition, recommends a level of 800 BTU/hour-ft² (2.5 kW/m²) as a public tolerance limit for exposure to radiant heat...”

The issue of choosing an appropriate exposure criterion for radiant exposure bears directly on whether the proposed project is in keeping with the intent of Congress in developing regulations for siting LNG facilities. The legislative history of 49 U.S.C. Section 60103(a) makes clear that Congress’s decision was based on a belief that the regulations “would require remote siting to the maximum extent possible.” Use of an exposure criterion suggesting that it is permissible to allow risk of significant health impacts in the event of an accidental or perpetrated release appears contrary to the expressed intent of Congress.

- Section 3.3, Terrorist Induced Releases of LNG, pages 3-9 to 3-13. The Quest analysis of terrorist-induced risk is deficient as a result of its narrow scope. The ships delivering the LNG must be considered in assessing terrorist risk. The relative damage and impact of any attack utilizing chemical and kinetic energy depends on the rate and amount of energy released and the distance to targeted receptors.

The probability of a terrorist attack at a specific location cannot be assumed to be a random event as it was in the Quest study. By assuming that all targets are of equal value and that the choice of a specific target is random, the Quest analysis underestimates the risk of an attack associated with the proposed facility at this location. The number of targets of equal value (12,711) identified by Quest is far too large, based on the visibility and economic value of the Port of Long Beach.

As noted in an earlier comment, the typical level of public risk deemed acceptable without further mitigation is 1 x 10⁻⁷ per year for an event with potential to cause 1000 fatalities and 1 x 10⁻⁸ per year for events that could cause 10,000 fatalities. A full breach of a fully loaded LNG vessel in the POLB, near tourist attractions, could cause fatalities in the ranges noted above. Using the Quest analysis and reducing the number of alternative targets that were used to 100 rather than 12,711 yields a risk of 7.15 x 10⁻⁶ x (12,711/100) or 9 x 10⁻⁴ per year. This level of risk is far higher than noted above, and cannot be considered insignificant. The uncertainties

¹¹ Other areas of concern raised in the report include: use of only a few approved models to specify the consequence of a spill, which limits the ability to address some of the problems of LNG consequence predictions; Process Safety Management requirements are not (and should be) imposed on LNG terminals; and the “accidental leakage source” in DOT regulations, which causes small connection pipe ruptures rather than full pipe ruptures to be evaluated.

associated with trying to quantify the risk of a terrorist attack make it necessary to evaluate such events on a deterministic basis by evaluating the acceptability of potential consequences assuming an attack will occur when all feasible mitigation measures that could reduce the risk to the lowest level possible have been applied.

- Sections 3.3 and 3.4, pages 3-9 through 3-13. These two sections are the only sections that address the issue of threat and security. A comparison is made that flammable fuel storage facilities are not as attractive a target for foreign terrorists than chemical storage facilities. While the data may be accurate about the population densities that surround facilities in the U.S. that store hazardous chemicals versus those that store flammable fuels, it is the population at risk that surrounds the POLB site that is of concern. Regarding the list of high-profile terrorist attacks involving U.S. citizens over the past 20 years (bottom of page 3-12), conclusions drawn from such a small number of incidents ($n=6$) are suspect. Therefore, the calculation found on the top of page 3-13 is without scientific or statistical bases and should be discounted and omitted from the DEIS/EIR document. The purpose of an EIS/EIR document is to assess the impacts of all plausible and credible scenarios and then calculate the odds (risk) of occurrence. The purpose of a security plan is to provide a level of protection against all plausible and credible scenarios for physical on-site and off-site infrastructure and cyber security.
- Section 4, Consequence Analysis, pages 4-1 to 4-37. The consequence analysis is deficient due to the limited scope of scenarios considered in the Quest study. The failure to consider a scenario involving terrorists taking control of an LNG carrier renders the source terms used in the modeling invalid. The rate of gas emission from an LNG pool on water is governed by an equilibrium process between the rate at which LNG is released from containment and the rate at which it is evaporated by the water it is spilled upon. Therefore, the assumptions regarding the rate of release are predicated on the release scenarios considered. If an LNG carrier were to fall under the control of a terrorist group, it is plausible that it could be rigged to release its entire contents very rapidly at the time it reaches a target location. Additionally, it is plausible that this type of scenario could be planned to avoid ignition of the LNG resulting in evolution of a massive, dense vapor cloud prior to ignition or possibly even detonation. In fact, the discussion regarding truck rollover accidents (Section 4.11.11.3, page 4-188) suggests that a major release can occur without immediate ignition.

The question of detonation of a large unconfined methane cloud is still open. It has been suggested that the likelihood of detonation of an unconfined vapor cloud is proportional to the cloud's mass. In 2004, a large methane release from a natural gas pipeline in Belgium resulted in a detonation of a large methane cloud. It is likely that the rapid dispersion of smaller releases have precluded frequent detonation from most methane releases of smaller amounts. It is also possible that a detonation

of the methane in a confined space within the cloud caused the very large cloud in the Belgium case to detonate. A similar detonation occurred in 2004 in Skikda, Algeria when a detonation in a confined space within an unconfined cloud caused detonation of the cloud itself. A large release from an LNG carrier into water near a heavily populated area could result in a similar event if an explosion within a confined space acted as an initiating event.

Even if the cloud did not detonate it could still cause a flash fire and subsequent pool fire. In either case, the resulting loss of life and economic damage could be significant. The potential area affected by a large vapor cloud is much larger than the distance for radiant heat exposure as demonstrated by Table 4-11 of the Quest study. It is not reasonable to discount a cloud forming over a populated area. If the cloud were slightly buoyant at its leading edge it could travel onshore for some distance before igniting.

- Section 5, Potential Impacts to Neighboring Facilities, pages 5-1 to 5-18. The analysis of potential impacts on neighboring port facilities is deficient due to the assumption that an attack will be external to the LNG carrier. If the LNG carrier falls under the control of terrorists it could result in extensive damage at any location where the vessel could travel.
- Section 6, Worst Case Hazards Associated with Other Flammable Fuel Facilities, pages 6-1 to 6-12. Only Facility #3 is comparable to the proposed project in having LNG carriers present. All other projects lack the associated carriers that could be used as weapons. Further the potential significance of nearby targets and associated economic loss are not similar to those associated with the proposed project.

The acceptable risk associated with industrial development is often much higher in foreign countries. In making a case for accepting the risk associated with the proposed project, the Quest study invokes comparisons of project risks associated with other fuel handling facilities that are not comparable to those associated with the proposed project, and to every day risks associated with daily life. However, it is inappropriate to compare risks of projects sited decades ago, in foreign countries, or before the threat of terrorism was a recognized threat. It is likewise inappropriate to compare voluntary and unavoidable public risk to those associated with a proposed project that is discretionary. It would be much more appropriate and useful to compare the risks of the proposed project to those associated with alternatives. In addition, any comparison should be discounted until the Quest study is corrected to reflect the plausible risk associated with a terrorist attack.

- Table 6-6, page 6-12. This table does not provide relevant information since it is inappropriate to calculate probabilities of LNG accidents and then to compare such probabilities with voluntary and involuntary risks to the public.

- Section 7.0, Conclusions, Section 7.1, Limitations of Study, page 7-1. See previous comment on Section 1.3 regarding the contention that the Quest study covers the full range of impacts that could be associated with the proposed project.
- Section 7.2, page 7-1. The question of potential for terrorist attack is not beyond the scope of the existing Quest study and is necessary for any NEPA/CEQA analysis. The question of whether the facility itself is a target depends on the level of prestige (intrinsic value) of other targets surrounding the facility. The risk of terrorist attack at this facility's critical components has not been assessed. The potential for use of an LNG carrier as a weapon is critical to evaluating the public risk associated with the project. Use of the factors cited in this section indicate that there are other targets near the proposed facility having higher prestige that could be attacked if an LNG carrier fell under the control of a terrorist group. Analysis of such risks and mitigation to avoid or reduce these risks should be considered. The risk of terrorist attack by means of an LNG carrier also requires that other alternative projects that could reduce this risk be considered in the EIS/EIR document.
- Section 7.3, Consequence Analysis for Worst-Case Releases, page 7-2. See previous comments
- Section 7.3.1, Flammable Cloud Travel Distances, page 7-3. The scenarios listed on page 7-3 do not include the largest release scenario involving terrorist capture of the LNG carrier and subsequent use of the vessel and its contents as a weapon. As a result of omitting a Criticality Assessment and Threat Assessment, as well as a risk analysis of use of an LNG carrier as a weapon, the statements in this section do not represent the maximum plausible and credible risk of the proposed project.
- Section 7.3.2, Vapor Cloud Explosion Hazard Distances. See comments on Section 4 pages 4-1 to 4-37. It is conceivable that an unconfined vapor cloud could traverse well into a populated area if its leading edge were buoyant enough to be traveling 25 to 50 feet above ground by the time it made land. Subsequent delayed detonation or ignition would expose anyone on the ground to the over pressure of the explosion or the radiant effect of the flash fire. The Quest analysis indicates that if a cloud formed it could travel to a distance of 19,330 feet from the release location. Any population under such a cloud could be seriously injured. This is a much larger area of impact than was postulated under a pool fire event.
- Section 7.3.3, LNG Pool Fire Radiant Hazard Distances, page 7-6. See comments on Section 2.2.3, page 2-2.
- Section 7.4, Potential Impact to Neighboring Facilities, pages 7-6 to 7-8. See comments on Section 5, pages 5-1 to 5-18.

- Section 7.5, Comparison to Other Flammable Fuels Facilities, pages 7-8 to 7-10. See comments on Section 6, pages 6-1 to 6-12.
- Section 7.6, Summary, pages 7-10 to 7-16. The summary of the Quest analysis underestimates the potential risk of the proposed project. The failure to consider the capture and use of an LNG carrier as a weapon is a significant omission which results in an analysis that does not accurately characterize the risk associated with the project.

The Quest study also fails to properly analyze terrorist motives and consequently does not comply with the recommendations of the DOE with regard to threat and vulnerability assessments for the energy sector.

- Table 7-4, page 7-11. This table shows that the probability of an accidental rupture of process equipment within an LNG terminal is on the order of 3 chances in 1000 per year (3×10^{-3}). This calculation is based on the historical record of all export and import LNG terminals worldwide. Presumably, these releases were not of a minor nature since they were all reported. This high probability based on actual events contrasts sharply with the very low, theoretical probabilities calculated for a rupture of process equipment as shown in Table 3-1, which are on the order of 10^{-6} and 10^{-7} . As noted previously, the historical record of an accidental release should be used to calculate probability.

We wish to thank you for this opportunity to comment on the DEIS/EIR document for the proposed Long Beach LNG Import Project. The Energy Commission staff believes the deficiencies in the DEIS/EIR document must be corrected before a final decision is made on whether to approve the project. The staff of the Energy Commission is available to discuss any of these comments, questions, or issues. Should you have any questions regarding the comments presented above, please call Terrence O'Brien, Deputy Director of the Systems Assessment & Facilities Siting Division, at (916) 654-3924, or Eric Knight, Energy Facilities Siting Project Manager, at (916) 653-1850.

Sincerely,

A handwritten signature in black ink, consisting of several loops and a long horizontal stroke extending to the right.

B. B. BLEVINS
Executive Director