

Responses to DGAA Observations

Submitted by 2/24/04

List of Attachments

	Number
Registration Records U.C. 90482, 90482, and S/N.....	1a
Notice of the Zoning of the Municipality of Canete for Strategic Treatment.....	1b
Charter of DICAPI Requesting Observations and Copies of TUPAM in Respect to Proceedings of the Director of Hydrography and Navigation.....	4
Información provista por el Ministerio del Trabajo y de la Promoción del Empleo	9a
Información relacionada con la población migratoria en la zona de Cañete y Chíncha (incluye los anexos 9.b.1 y 9.b.2)	9b
Documentos que contienen información de INEI respecto a la PEA y la población ocupada en las provincias de Cañete y Chíncha	9c
Información de los desembarques de pescadores artesanales en el puerto de Tambo de Mora. Esta información no considera los volúmenes no declarados por los pescadores que desembarcan en la playa	9d
El anexo 13a contiene información recogida durante las observaciones de campo, relacionada con los pescadores de Cañete y Chíncha	13a
En el anexo 13b, se incluye una copia de los registros proporcionados por ORUS, la cual proporciona la documentación de todos los pescadores que cruzan el área	13b
Social Audit Matrix Annex 2.....	16
Annex No. 1.....	17
Maximum Monthly Discharge of Canete River Socsi.....	19.3a
Minimum Monthly Discharge of Canete River Socsi.....	19.3b
2001 Site Investigation Report.....	23a
2002 Site Selection Report.....	23b
2002 Site Investigation Selection Summary.....	23c
Wind Distribution of Frequency and Direction.....	29.1
Noise Model.....	29.4
Painting Specifications and Welding Specifications	30.4a
MSDS for Amerel Antifoam Chemical.....	30.8a

MSDS for Activated Carbon Impregnated with Sulfur HGR.....	30.8b
Air Quality Impacts Due to Start-up.....	38a
Maximum Pollutant Impacts Predicted for the Project using 1996 Meteorological Data from Pisco and Lima, Peru.....	38b
Code of Conduct for Workers.....	39.7
Floor Plan for the Proposed Dining Facility.....	40.6
Monitoring Stations.....	44
Stability and Physical Risk Map.....	45.1
Modeling of Desalinization Brine Plume at Playa Melchorita, Peru.....	50
USACE Coastal Engineering Manual Pgs V-3-43 thru V-3-55.....	79a
Suspended Solids 2003.....	79b
Sedimentation Trap Capture Data.....	79c
Typical Incinerator Specification.....	83.4
MACROCONSULT Report.....	93
Various Documents Relating with the Location of the Area of Interest where the Project is Located.....	95
traducción del informe de ruido elaborado por KBR en el cual se incluye el balneario de Wakama.	101
Dredged Disposal Material Report.....	104
San Martin 1004 PVT Comingled.....	114
Estimated Equipment Summary for Peak Construction Phase.....	120a
Cliff Stability.....	122
Conditions of Cementation of the Breakwater in Melchorita.....	135
Matrix (1) without PMA.....	136a
Matrix (2) with PMA.....	136b
Metocean Measurement Report.....	141a
Currents at Breakwater.....	141b
TUPAS and Various Documents.....	148

Mobil DTE 724 Oil.....	151
Weather Data.....	155
API Separator Schematic.....	162a
CPI Separator Schematic.....	162b
Relation of Documents with the Concession of the Aquatic Area.....	167
Dredging Disposal Site Water Analysis and Sediments 19Dec03.....	172a
Dredging Disposal Site Water Analysis and Sediments 22Dec03.....	172b
Dredging Disposal Site Seawater and Bottom Sediments Analysis Dec 2003....	172c
Dredging Disposal Site Benthos Stations D2 D5 D7 D8 Dec 2003.....	172d
Dredging Disposal Site Plankton and Microbenthos December 2003.....	172e
Dredging Disposal Site Seawater TPH Analysis December 2003.....	172f
Dredging Disposal Site Seawater Temperature, Salinity and BOD Dec 2003....	172g
Oil Spill Response Report.....	180a
Hunt Incident Report Form.....	180b
Original Laboratory Signatures.....	181
Borehole Organic Material tests.....	185a
BOD Water and Sediment Melchorita.....	185b

OBSERVACIONES DE DGAA

OBSERVATIONS

LEGAL ASPECTS

1. Regarding the purchase of the property where the plant will be installed, indicate:
 - a. The legal procedure followed with the Superintendence of National Assets to purchase the property, and attach documentation supporting said purchase.
 - b. A copy of the Zoning Certificate issued by the Municipality of Cañete.

Response 1.a.

The following steps have been taken to acquire the property:

Background Information.-

In May 2002, after analyzing different sites that failed to comply with the conditions required to carry out the project, a number of steps were taken to locate the owner of the plot of land that was finally identified as the area of interest. The area of interest initially included 323,014 hectares, but this area was then expanded to include 521.0012 hectares, exclusively for technical reasons. The property in question is located at Km. 167 of the South Panamericana Highway, in the district of San Vicente de Cañete, Province of Cañete, Department of Lima.

Direct sale of the land.-

1. In order to start the corresponding purchase process, searches were conducted within the competent entities - PETT, the Public Registry Office and the Urban Property Registry Office, to obtain the ownership data. The information was provided by the Ministry of Agriculture (Land Register Units 90378 and 90340, duly registered on Cards 21001312 and 21001528, which were then made independent, as we will explain later on in this document).
2. By means of Supreme Resolution N° 001-99-AG, Proinversion was entrusted with the task of auctioning Land Register Unit 90340, as part of the private investment promotion process. The necessary steps were taken to exclude this unit from the private investment promotion process.
3. For this reason, an application was filed with the PETT on June 4, 2002, asking for the issuance of the necessary reports and for the adoption of the necessary measures to make the area of interest independent, subject to the prior assignment of new Land Register Units (Land Register Units 90482 and 90483 were finally established), their registration in the Public Registry Office, and the issuance and submission of a technical and legal report and a proposed Supreme Resolution to the Ministry of Agriculture for the latter to be excluded, by means of a Supreme Resolution, from the area that formed part of the Irrigation Project.
4. The total area required for the Project includes 521.0012 ha., of which 479.3357 ha. (Land Register Units 90482 and 90483) belonged to the Ministry of

Agriculture. Part of said area (339.9940 ha) formed part of the Pampas de Con Cón- Topará Irrigation Project. This area was excluded from the private investment promotion process by means of Supreme Resolution N° 026-2002-AG dated October 16, 2002.

5. We were able to prove that, from the total area referred to above, some land (41,6655 Ha.) had not been registered in the Public Registry Office. The necessary steps were taken with the Superintendency of Public Property (SBN) for the first registration of ownership. We named and identify this area as Land Register Unit S/N.
6. Finally, Land Register Units 90482 and 90483 were transferred for no valuable consideration whatsoever by the Ministry of Agriculture to the State, represented by the SBN.
7. All Land Register Units (90482, 90483 and S/N) are registered in the SINABIP to the name of the Peruvian State.

The Peruvian State has authorized the direct sale of all three Land Register Units. However, the sale has still not materialized because the Lima Region is currently negotiating a participation in the sale with the Peruvian State.

See attachment that includes copies of the registration entries and other documents related to this answer

Response 1.b.

Right now, it is not possible to provide a copy of the Zoning Certificate issued by the Provincial Municipality because PLNG has just started the corresponding process and is also waiting for the issuance of the title deed to the plot of land, which is one of the requirements prior to requesting the zoning certificate.

It is worth pointing out that the area where the LNG Plant is expected to be installed has been classified as a Strategic Treatment Zone by the Provincial Municipality of Cañete (see attachment that contains copies of the ordinances issued in relation to the zoning for use of land in the Province of Cañete, published in the Official Gazette El Peruano). For this reason it is possible to install the Plant or carry out any other economic activity that the Municipality may wish to promote in the area of interest. This information was confirmed during the meeting held on November 12, 2003 at the Provincial Municipality with Mrs. Rufina Levano Quispe, Provincial Mayor, Eng. Rolando Aguado Saldaña, Project Director, Eng. Walter Giles R., Councilman and Chairman of the Cañete Municipality Projects Commission, and Mr. Armando Guerra, Legal Counsel.

Once we obtain the zoning certificate, it will be delivered to the DGAA – MEM

2. Indicate what the company's policy will be with regard to environmental and social aspects during the construction stage, operation and closure of the project.

Response 2

The company's Environmental Health and Safety Policy and Community Relations Policy are effective for all stages of the project. Under these policies the company develops procedures and guidelines to implement the policy. Peru LNG is also using an EHS Management System to implement a comprehensive program similar to ISO 14000 to manage Environmental and Safety Programs and Compliance. The Policies, Guidelines and EHS Management System are found in Volume I, Chapter 5, Section 2 of the Environmental Impact Assessment. The Policies are included as follows:

PERU LNG S.R.L.

POLÍTICAS DE SEGURIDAD, SALUD Y PROTECCIÓN DEL MEDIO AMBIENTE

Peru LNG S.R.L. esta comprometida con la salud, seguridad y protección ambiental para sus empleados, clientes, comunidades locales y quienes puedan ser afectados por sus actividades.

Es la intención de la empresa:

- Conducir sus operaciones de manera que se proteja la seguridad y salud de sus empleados y público en general, evitar los impactos ambientales adversos y mitigar aquellos impactos inevitables en el medio ambiente;
- Informar e instruir a los acerca de los requerimientos de seguridad, salud y medio ambientales y mantener a cada jefe de línea responsable del cumplimiento de esta política en lo concerniente a su área;
- Brindar a los empleados un entrenamiento y educación adecuados, en aspectos de seguridad y medio ambiente y mantener a cada empleado como responsable del cumplimiento de esta política al realizar su labor;
- Cumplir con toda la reglamentación legal aplicable de seguridad, salud y medio ambiente.
- Proveer apoyo técnico y legal a aquellos jefes de línea responsables del cumplimiento de esta política.
- Incentivar la comunicación a tiempo de los incidentes de seguridad, salud y medio ambiente.
- Alentar a los empleados a comunicar sus inquietudes a las jefaturas con respecto a riesgos de seguridad, salud y medio ambiente no resueltos que puedan haber sido identificados en las operaciones de la empresa.
- Llevar a cabo revisiones ambientales y de seguridad de las operaciones de la empresa a fin de evaluar el cumplimiento con esta política.

Entregar copia de esta política a los contratistas y notificarles que ellos y sus subcontratistas deberán cumplir sus labores con la empresa de acuerdo con esta.

Community Relations Policy

PERU LNG S.R.L. has a responsibility to conduct business in a way that benefits the communities in which we operate and society as a whole. We accomplish this by being responsible corporate citizens in the communities where we live and work. Our success depends upon the competency of our people, protection of the natural environment, and the value we bring to communities. Our company builds a legacy of trust by developing and operating oil and natural gas projects around the world in a manner that is healthy, safe and respectful of human life and the environment. To ensure the long-term success of both our company and the community, we believe in a proper balance between the economic viability of our projects and the broader needs of the communities in which we work.

At PERU LNG S.R.L., we are committed to the following community relations principles:

- Conducting operations according to high standards for personal integrity and ethical behavior;
- Respecting the laws and regulations of the governments with whom we work and the beliefs and values of communities;
- Providing an open exchange of information that is clear and relevant between communities, leaders, affected parties and the company;
- Communicating expectations for community relations with all our employees and contractors; and
- Routinely reviewing the effectiveness of our community relations programs.

Política de Relaciones con la Comunidad

PERU LNG S.R.L. tiene la responsabilidad de conducir sus actividades de forma que beneficie a las comunidades en las que opera y a la sociedad como un todo. Esto se logra siendo ciudadanos corporativos responsables en las comunidades donde vive y trabaja el personal de la Compañía. El éxito depende de la competencia del personal, protección del ambiente natural, y el valor que la Compañía trae a las comunidades. La Compañía construye un legado de confianza implementando proyectos de desarrollo y operación de petróleo y gas natural en todo el mundo de manera saludable, segura y respetando la vida humana y el medio ambiente. Para asegurar el éxito a largo plazo tanto de la Compañía como de la comunidad, la Compañía cree en el balance adecuado entre la viabilidad económica de sus proyectos y las necesidades más amplias de las comunidades donde opera.

PERU LNG S.R.L., está comprometida con los siguientes principios de relaciones con la comunidad:

- Conducir operaciones según altos estándares de integridad personal y comportamiento ético;
- Respetar las leyes y reglamentos de los gobiernos con los cuales trabaja así como las creencias y valores de las comunidades;
- Ofrecer un intercambio de información abierto que sea claro y relevante entre las comunidades, líderes, partes afectadas y la Compañía;
- Comunicar las expectativas en cuanto a las relaciones con la comunidad a todos los empleados y contratistas; y

Revisar, regularmente, la efectividad de los programas de relaciones con la comunidad

-
3. It is necessary to specify that the company responsible for the development of the "LNG Exportation" Project is the operator and not the contractors and subcontractors who will provide the different services for the construction, installation, operation and closure of the project.

Response 3

The company as operator accepts responsibility for development of the project from construction to closure. Contractors and subcontractors are responsible to the company as operator for fulfilling their obligations under their contracts.

4. Submit the Certificate of Approval of the Oceanographic Study issued by the Hydrography and Navigation Bureau of the Peruvian Navy.

Response 4

The Certificate of Approval of the Oceanographic Study issued by the Hydrographic Bureau (DIHIDRONAV) cannot be delivered at this moment. The Certificate, according to information provided by the General Bureau of Harbor Masters' Offices and Coast Guards (DICAPI), forms part of the procedure that must to be followed to obtain an Aquatic Concession, which is described below:

- Once a Reserve is granted over a given water area, the applicant, in this case PLNG, must file all of the documents requested under procedure B-02 of the TUPAM, for purposes of the issuance of a Resolution authorizing the use of the water area (procedure started by PLNG on October 2, 2003).

- The General Bureau of Harbor Masters' Offices and Coastguards, upon receipt of the corresponding application, checks the information filed, in this case by PLNG, and then makes observations with regard to the documents filed (received by means of Official Letter V-200 DICAPI on November 18, 2003), which coincide with the observations sent by the DGAA to PLNG.
- PLNG must rectify each and every observation (once PLNG has provided DGAA and DICAPI with all its answers to the observations).
- Once the observations have been rectified, to the extent DICAPI gives its consent, the docket is to be sent to DIHIDRONAV for its evaluation and the subsequent delivery of the Certificate of Approval of the Oceanographic Study to DICAPI, for purposes of the final issuance of the Supreme Resolution authorizing the Concession.

Accordingly, the Certificate forms part of the procedure followed to obtain a Concession over an Aquatic Area. This procedure requires the prior approval of environmental matters by DICAPI, before the Certificate of Approval of the Oceanographic Study is issued to then obtain the aquatic concession.

See attachment that contains a copy of the letter sent by the General Bureau of Harbor Masters' Offices and Coastguards and a copy of the procedures contemplated in the TUPAM, corresponding to the Hydrographic Bureau, proving that said document does not contain any procedure to obtain the Certificate in question through DIHIDRONAV.

5. Local labor is one of the requirements raised during the Public Hearings by the inhabitants of the direct area of influence. It is necessary for the company to indicate what the minimum requirements are to fill a vacant position.

Response 5

To apply for a vacancy, the requirements will be made public according to the vacancy to be filled in each specific case and the provisions set forth in Chapter V, Card GS-3, of the EIA, which deals with the support to be provided to local hirings. Thus, for example, among other requirements, the applicant cannot consume drugs, cannot have a criminal record, should be identified by an ID document, should have completed certain educational levels to apply for more specialized vacancies, and should undergo a medical checkup to be carried out by the employer, as well as any other requirements defined by PLNG.

In addition to the information set forth in said card, it is worth pointing out that PERU LNG will have an office in Cañete and another one in Chincha to deliver information to the applicants on the bidding processes.

6. Indicate what the company's policy will be in relation to the employment contracts that the company will enter into with the fishermen (labor benefits). Attach a copy of the model contract.

Response 6

In the hiring process, no distinction will be made between applicants, for which reason the requirements will be those considered in Response 5 above and other requirements to be established bearing in mind the job involved in each case.

SOCIAL ASPECTS

7. Once the project construction operations begin, there will be heavy mobilization of persons, trucks, equipment and machinery; employment will be required by persons from other localities; intermediaries will appear as well as private or commercial institutions which will foster said demand. The company must indicate the mitigation measures it will adopt to minimize the impact.

Response 7

- a) Employment requirements for persons from other localities.

PERU LNG S.R.L. will establish general guidelines for the hiring of a local labor force, which, will specify in the Contractor's contract a preference to employ local labor force for the project. Every candidate will know in advance the specific requirements needed for each job. Verification of residency of the applicant interested in working for the project shall be established. (Vol. I, Chapter V, Module GS -3)

To facilitate local hiring, PERU LNG S.R.L. will establish two offices, one in Chincha and one in Cañete.

Non-resident workers will be housed in the construction camp. Non resident and resident employees visiting Cañete or Chincha during their employment, will be bound by a code of conduct which regulates the behavior of work and afterwork hours in these locations. (Vol. I, Chapter V, Module GS - 3)

Additional information is provided at Volume 1 Chapter V, Sections GS-3, .

- b) Appearance of intermediaries as well as private or commercial institutions which will foster said demand

PERU LNG S.R.L. will establish general guidelines for the use of local services and resources. The guidelines will specify, as one of its requirements that its contractors provide preference for the use of local services and resources available in the direct area of influence. PERU LNG S.R.L. will use local services and resources assuming that the services and resources comply with quality, quantity and price standards. PERU LNG S.R.L. will also specify that the use of local services and resources do not disrupt the communities' use of those same resources and services. (Vol. I, Chapter V, Module GS - 4)

Additional information is provided in Volume 1 Chapter V, Sections GS-2 and GS-4.

8. The project will require increased traffic for the transportation of equipment, machinery and consumables of various types; however, the risk of traffic accidents will increase, it being absolutely necessary to foresee various actions aimed at preventing accidents; specify them.

Response 8

Most of the equipment and materials that will be used during the construction phase will arrive at the Port of San Martin in Pisco and be transported to the Project site. Additionally, a small portion of the shipments will arrive at the Port of Callao in Lima. Therefore, it is presumed that the roads to be used for the transportation of machinery, equipment and materials include the route between Pisco and Pampa Melchorita (Km. 167) over the South Pan-American Highway and to a lesser extent the South Pan-American Highway between Lima and Pampa Melchorita. Additionally, mobilization of personnel will mainly use the South Pan-American Highway between the localities of Chincha and San Vicente de Cañete to Pampa Melchorita (Km. 167). (Vol. I, Chapter V, Module AC - 2)

Additionally, mobilization of personnel will mainly use the Pan-American Highway between the localities of Chincha and San Vicente de Cañete. (Vol. I, Chapter V, Module AC - 2)

PERU LNG will comply with all the regulations from the Transportation Ministry, e.g., truckload and weight limitations, required signage on vehicles and roads, etc.

PERU LNG S.R.L. will provide project information regarding potential nuisances to the population, disturbance of Road and Transportation systems. The goal is to ensure that the communities are informed of the project's activities and that inquiries by local population are properly addressed in a timely manner as they arise to mitigate potential impacts. (Vol. I, Chapter V, Module GS - 1)

PERU LNG S.R.L. will mitigate the effects on the social and economic infrastructure in the communities within the areas of influence. Some of the measures to be implemented include the following:

- ✓ driver training for complying with safety standards and assigned routes, (Vol. I, Chapter V, Module GS - 2)
- ✓ road signs, (Vol. I, Chapter V, Module GS - 2)
- ✓ speed reduction zones in populated areas (Vol. I, Chapter V, Module GS - 2)
- ✓ a hotline for emergency contacts. (Vol. I, Chap. V, Module GS - 2)
- ✓ Periodic maintenance of vehicles, machinery and equipment will be carried out, ensuring the safety and synchronization and carburetion of the engines. (Vol. I, Chap. V, Module AC - 2)
- ✓ washing of machinery, equipment and vehicles will only be allowed in specific locations designed to prevent any discharge of lubricants and fuel into rivers or other sensitive areas. (Vol. I, Chap. V, Module AC - 2)
- ✓ the mobilization of personnel to and from the project site will only be carried out using vehicles that meet all PERU LNG S.R.L vehicle mechanical and safety specifications. Periodic inspections of the condition and maintenance of vehicles will

be performed by the Contractor and reported to the construction HSE management.
(Vol. I, Chap. V, Module AC - 2)

More information is provided at Volume 1 Chapter V, Sections GS-1, GS-2 and AC-2.

9. The quantitative data of the diagnosis for the Baseline at year 2000 are quite outdated; this is of particular concern with regard to the economically active population (PEA), based on a 1993 census. It is necessary to make an updated survey of demographic data, based on a statistical sample (basically employment data).

Response 9

The 1993 census is the last official census taken by the government of Peru. The Peru LNG Project's Environmental Management Plan is not affected by any variations in the results of the census, but rather on ensuring that whether through skills training, employment, use of local subcontractors, etc. that the communities and their development within the area of influence of the Peru LNG Export Project are beneficially impacted with sustainable development on a measurable increase and not a percentage basis. An example of this is that Peru LNG will not preferentially hire from San Vicente de Canete over Chinchipe based on the determination from the 1993 census data that San Vicente de Canete were more economically depressed. Even if a new census were taken and the results indicated that Chinchipe was now more economically depressed, Peru LNG would still provide training and hiring based on the project's manpower requirements and on an individual's existing skills evaluation, regardless of their community of origin.

The baseline study was made using the following sources:

1. Population
 - a. Cañete Province: INEI 2002 (Vol. I Chap. III, Vol I, Chap III, page 5-3)
 - b. Cañete District: INEI 2002 (Vol I, Chap III, page 5-4, Table 5-1)
 - c. Chinchipe Province: INEI 2002 (Vol I, Chap III, page 5-5)
 - d. Cañete District: INEI 2002 (Vol I, Chap III, page 5-5, Table 5-2)
2. Demographic Features
 - a. Population Density
 - i. Cañete Province: INEI 2002 (Vol I, Chap III, page 5-3)
 - ii. Cañete District: INEI 2002 (Vol I, Chap III, page 5-4)
 - iii. Chinchipe Province: INEI 2002 (Vol I, Chap III, page 5-5)
 - iv. Chinchipe District: INEI 2002 (Vol I, Chap III, page 5-6)
 - b. Rural and Urban Distribution
 - i. Cañete Province: INEI 2002 (Vol I, Chap III, page 5-3)
 - ii. Cañete District: INEI 2002 (Vol I, Chap III, pages 5-4, 5-5)
 - iii. Chinchipe Province: INEI 2002 (Vol I, Chap III, page 5-5)
 - iv. Chinchipe District: INEI 2002 (Vol I, Chap III, page 5-6)

c. Gender Distribution

- i. Cañete Province: INEI 2002 (Vol I, Chap III, page 5-4)
- ii. Cañete District: INEI 2002 (Vol I, Chap III, page 5-5)
- iii. Chinchá Province: INEI 2002 (Vol I, Chap III, page 5-5)
- iv. Chinchá District: INEI 2002 (Vol I, Chap III, page 5-6)

There is a summary table for 1 and 2 items, table 5-3, (Vol I, Chap III, page 5.6)

3. Poverty

- a. Cañete: Strategic Development Plan, 1998 (Vol I, Chap III, page 5-7)
- b. Chinchá: 2000 Poverty Map, Foncodes (Vol I, Chap III, page 5-7)

4. Housing

- a. Cañete: INEI 1993 and field work made by a Golder staff Mar-Apr 2002 (Vol I, Chap III, page 5.7)
- b. Chinchá: INEI 1993, and field work, Mar-Apr 2002 (Vol I, Chap III, page 5.8)

5. Education

- a. Cañete (province and district)
 - i. Primary and Secondary Education and Literacy: USE 08, 2001 (Vol I, Chap III, page: 5-8, 5-9).
 - ii. Higher Education: INEI 1993 (Vol I, Chap III, page 5-8)
- b. Chinchá (province y district)
 - i. Primary and Secondary Education and Literacy: District Municipalities, 2001; Department Statistics Compendium, INEI, 2001, Basic Statistics 2002, Ministry o Education (Vol I, Chap III, page: 5-9).

6. Health

- a. Cañete: Poverty Map 2000 Foncodes; Ministry of Health 2000; Ministry of Health 2002 (Vol I, Chap III, page 5-9, 5-10, 5-11)
- b. Chinchá: Poverty Map 2000 Foncodes; District Health Centers, 2002 (Vol I, Chap III, page 5-11)

7. Services (water and drainage)

- a. Cañete: Poverty Map 2000 Foncodes, INEI 2002 (Vol I, Chap III, page 5-12, 5-13)
- b. Chinchá: Poverty Map 2000 Foncodes (Vol I, Chap III, page 5-13)

8. Electrical Power

- a. Cañete: Poverty Map 2000 Foncodes, Strategic Plan 1998 (Vol I, Chap III, page 5-17)
 - b. Chinchá: Poverty Map 2000 Foncodes (Vol I, Chap III, page 5-17)
- 9. Employment
 - a. Cañete: PEA, INEI 1993 (Vol I, Chap III, page 5-18)
 - b. Chinchá: PEA, INEI 1993 (Vol I, Chap III, page 5-18)
- 10. Agricultural Activity
 - a. Cañete: INEI 1994 National Census of Agriculture, PETT 2000, Ministry of Agriculture 1999 (Vol I, Chap III, page 5-19 a 5-22)
 - b. Chinchá: Ministry of Agriculture 2001, Irrigation Board of Chinchá 2002 (Vol I, Chap III, page 5-22, 5-23)
- 11. Commercial Activity
 - a. Cañete: Municipality of Cañete 1994 and 2002 (Vol I, Chap III, page 5-24)
 - b. Chinchá: District Municipalities 2002 (Vol I, Chap III, page 5-24)
- 12. Fishing Activity
 - a. Golder Associates Peru S.A., field work for baseline studies, March-April 2002

10. Is there any assurance that the plant in full operation will not emit annoying odors or substances that may affect the neighboring populations?

Response 10

Air quality impacts during construction are anticipated to be temporary and intermittent from construction sources. The associated air pollutant emissions will primarily be in the form of dust or particulate matter (PM) associated with earthwork operations and no odors or other emissions are expected. Dispersion of the dust will be less than 1 km from the site.

The PLNG liquefaction plant design uses low NO_x (DLN) technology to reduce equipment emissions from burning clean, dry, natural gas for fuel to below World Bank Standards of less than 25 ppm NO_x. The natural gas contains no sulfides and is very clean burning without odor. In the event of an operational upset, an emergency flare system has been designed that safely burns any excess gases to prevent emission of hydrocarbons or pollutants directly to the atmosphere.

The plant includes acid gas removal, gas dehydration, and refrigeration processes that do not generate odor. The only potential odor-causing agent is a sulfur-based compound called hydrogen sulfide that occurs naturally as a by-product of oil and gas formation and may be present in produced gas and liquids. Although there are no indications that it will be present in the natural gas received at this plant from the Camisea gas fields, an acid gas removal unit has been designed and will be installed that will remove any hydrogen sulfide should it occur.

In addition, activated carbon will be utilized as a means of removing any heavy metals or odors associated with the treated feed gas.

Based on detailed modeling studies of expected plant operations, total air quality concentrations of other expected pollutants, NO₂, SO₂, and CO, are predicted to be less than 20 percent of the ambient air quality guidelines or standards. For PM₁₀, the total air quality concentrations are predicted to be less than 66 percent of the guidelines or standards.

Therefore, no appreciable impacts on the ambient air quality for neighboring populations are expected.

11. In the vicinity of the Project there is untitled land which different types of merchants could take possession of to sell liquor, food, services and prostitution. It is important to consider measures to prevent these activities from appearing. What actions do you contemplate taking in this respect?

Response 11

PLNG plans to provide no encouragement to itinerants or illegal merchants and measures will be taken to restrict contact with them, e.g., 1) no hiring will be made from the access gate to the site, 2) workers from the communities that return to their homes each day will be transported only by buses, which will not be allowed to stop at any unapproved vendors or shops, 3) shops for personal items, newspapers and other convenience items will be set up within the temporary camp to provide for employee needs, 4) casual foot traffic will not be allowed between the construction camp or work areas and the access gate on the Pan American Highway, 5) all employees will sign a Code of Conduct as part of the service contract with agreement to dismissal for infractions that include regulating behavior after work hours, 6) the behavior rules will be reinforced during the regular safety meetings, and 7) the performance of the program will be monitored and assessed on a regular basis.

Additionally all steps will be taken to encourage municipal and regional authorities to enforce all laws and regulations regarding untitled land adjacent to PLNG property.

PERU LNG S.R.L. will establish a Code of Conduct to regulate the behavior inside and outside of the camp in neighboring communities. The Code of Conduct will apply to both local and non-local employees, contractors and subcontractors. The Code of Conduct will include training for personnel in conduct and behavioral attitudes towards the communities and authorities. (Vol. I, Chapter V, Module AC – 1)

All the workers shall comply with the establishment and implementation of the Code of Conduct stating the rules of behavior. Any violation of the Code of Conduct by the worker may be cause for termination of their work contract. (Vol. I, Chapter V, Module AC - 1)

PERU LNG S.R.L. will assign a specialist in a Community Relations Office for the management of social components of the project. This person will be in charge of identifying and reducing negative social aspects and of identifying potential impacts. As part of this plan PERU LNG S.R.L. will identify authorities, agencies, organisms or

religious institutions, which can collaborate in the planning and mitigation of detected issues. (Vol. I, Chapter V, Module GO - 1)

PERU LNG S.R.L. will work closely with local authorities to launch campaigns around values, with the perspective of strengthening citizenship. Also, PERU LNG S.R.L. will identify NGOs and educational institutions to design plans and programs to help temporary workers in maximizing their benefits from new activities.

Additional information is provided at Volume 1 Chapter V, Sections AC-1, GO-1. See for Attachment 11 Code of Conduct for Workers and Response 39.7.

12. Fishermen and scholars raised their concerns on the implementation of the dock, mooring posts, trestles and breakwaters, which could alter the water movement and reduce fishing. What is your opinion in this respect?

Response 12

Collateral effects on the physical and biological components of the marine ecosystem derived from dredging activities, driving piles for construction of trestle structure and construction and operation of breakwater are described in Section 4, Chapter IV. In summary, dredging of the Navigational Channel during construction will create temporary impacts on the marine ecosystem such as increased turbidity, loss of habitat and benthic species (by removal of substratum at direct area where channel is to be constructed and at final disposal area) and migration of mobile species (such as fish and plankton) to areas of less disturbance. Once the navigational channel construction is completed and dredging activities have ceased, the disturbed area will immediately commence to be re-colonized by benthic and plankton species from the surrounding areas. In addition, the re-colonization of these base trophic level (food chain) species, aided by the more stable conditions created by the protection of the breakwater to the west, will result in the return of mobile species.

Driving piles for construction of the trestle will generate intermittent noise and a slight increase in turbidity during construction. Slightly localized changes in the pattern of wave action and sediment transport will also occur once the piles are in place and acting as a part of the trestle structure. However, some benthic communities will utilize these pilings as habitat and commence colonizing the piles soon after they are in place.

Construction of the breakwater will generate temporary effects, such as increased turbidity, loss of benthic species habitat (by removal of some substratum and the covering of the substrate with rocks) and migration of mobile species to less disturbed areas. Once the breakwater is constructed, it will serve to reduce the impacts of the waves on the LNG loading operations, creating some localized changes in sediment transport and the pattern of wave action due to wave diffraction. The localized changes in wave action and sediment transport will generate changes, such as accretion and erosion, in the morphology of the shoreline on the project property and increase the potential for such effects on shoreline areas immediately to the north and south of the project property boundaries. However, the rock used to construct the breakwater will generate new habitats to be colonized by species (particularly benthic) that adapt to rocky environments, which will result in the return of the mobile species and slowly create a new ecosystem with species of different trophic levels (food chain).

13. The population that will be most directly affected are the artisan fishermen who carry out their activities in area close to the site where the plant will be built; consequently, it is necessary to develop various actions with them. For this reason, it is important to know their number, location, issues arising from the project components. In order to mitigate these impacts it is necessary to design strategies and programs that will allow overcoming the social impacts for said group. What actions will be taken in this regard?

Response 13

Field observations during baseline studies (Feb-May 2002) noted that an average of 4 to 7 fishermen use the beach at the project site as a means to transit along the beach to alternative fishing areas in search of seasonal migrating fish populations. PERU LNG S.R.L. will build two alternative paths (with stairs) at each side of the site, to allow the fishermen' transit from north to south and vice versa in a safe and efficient manner.

It was also observed during the baseline studies, that the fishermen are accustomed to utilizing a large stretch of the shoreline for fishing based on the abundance of species and the season. The project area represents approximately 1% of the total area that is routinely used by the fishermen. The beaches mostly mentioned by the fishermen during the fieldwork are those located south from Melchorita, Wuacama, Jaguay and Pampa Larga. Other beaches, noted that are used by the fisherman, are located in areas of rough surf or in areas where rock outcrops (north of Melchorita, 5 Cruces) wher their access is restricted and the climb up the cliff is difficult while carrying the fish by hand. Other areas with abundance of fish are the areas north of Melchorita, Auque, Mulato and Mulatito.

Additional information is provided at Volume 1, Chapter III Sections 5.4.2.3, Volume I, Chapter V, GO-2, and Vol I, Chapter III, page 119.

ORUS, the security company in charge of providing site security, reported the presence of 96 fishermen who crossed the property from June 2002 until December 2003. This information is referred to as the area between the Pan American Highway and the cliff zone, the area that is used by the fishermen for beach ingress and egress.

A copy of the records provided by ORUS is attached as part of this response and provides documentation of all the fishermen that crossed the area. Of interest is the increase in the number of fishermen that have crossed the site during the last few months of the EIA process.

14. What programs related to Local Development has the company planned to implement and how will Development Plans be articulated with the local governments?

Response 14

PERU LNG is currently preparing a Community Relations Program. Plans for the direct area of influence will be prepared as soon as information in local Strategic Development Plans is made available to the project.

The province of Cañete is currently updating the 1998 Strategic Development Plan, thus more real data and an additional approach will soon be made available to the project. According to information provided by officers of the Municipality of Cañete, this plan is expected to be completed in the second quarter of 2004.

Chincha is currently preparing its Strategic Development Plan for the period covered until the year 2013. Much progress has already been made in relation to this Plan, but it is still a draft. The Plan is still to be corroborated with different sectors and all the information is to be consolidated. According to information provided to us by the personnel in charge of this effort, once it has been completed it will be filed with the Ministry of Economy and Finance for approval.

15. At present, companies make Social Responsibility commitments to the regions and support their development. It is important to define commitments that will allow considering the company as an important development agent, but not responsible for it?

Response 15

As stated in the response to question 14, Peru LNG is preparing a Community Relations Plan that is mainly aimed at achieving sustainable development to thus build capabilities not only for the present but also for the future. The plan calls for constant communications with authorities and the community.

16. It is of utmost importance to have a social audit matrix in place that will allow evaluating the project's impacts on a permanent basis. To this end, quantifiable indicators on the different phases of the project have been specified. We are attaching a social audit matrix according to which it will be mandatory to deliver said information on a monthly basis, Annex 2.

Response 16

The social audit matrix is provided as Attachment 16.

ENVIRONMENTAL ASPECTS

17. The company must commit itself to submit on a monthly basis the Environmental and Social Monitoring and Auditing Program of the "LNG Exportation" Environmental Impact Assessment, which is attached hereto as Annex 1.

Response 17

The company will submit the Environmental Monitoring and Management Auditing report in accordance with the documents requested as attached in Annex No. 1, provided as attachment 17. The Social Monitoring Program has been analyzed in Response 16.

18. Submit an environmental audit matrix that will allow evaluating the project's impacts on a permanent basis through quantifiable indicators during the different phases of the project.

Response 18

As suggested by DGAA in observation No. 16 and annex 2, the proposed audit matrix will incorporate the elements of the physical and biological change indicators provided in Table 1 "Change Indicators" presented in Section 2.2 of Chapter IV. The indicators included in both of these documents will be used to evaluate all changes to the indicators established in the EIA in conjunction with the Environmental Monitoring Plan provided in Chapter V.

The Environmental Management and Monitoring Plan are presented in Chapter V. Specifically the Management Plan presents the following sections:

- Introduction
- Environment, Health and Safety and Community Relations Policies and Guidelines
- Objectives of the Plan
- Environmental Management Modules during Construction and Operation

The elements of the audit program are presented in Section 4.2.1.5. The purpose of the audit program is to review internal management systems applied and to identify areas where potential environmental, social, health or safety issues will be raised. The objectives of the audit program are summarized as follows:

- Provide advance warning detection;
- Assure compliance with regulatory conditions, and
- Verify the efficiency of the established environmental policy

The audit program as outlined in Chapter V will be conducted by an audit team consisting of specialist with experience and technical knowledge of the installation, equipment and processes. The environmental audit team will conduct the following:

- Assessing compliance with current regulations, corporate policies and agreements, written operational procedures, and permit conditions
- The audit will be conducted by:
 - Reviewing current applicable regulations
 - Conducting interviews and
 - Field Inspections
- The audit team will establish a classification system which will be used to assess all its findings
- The audit report will include a proposed action plan and a schedule for implementing corrective measures.

LIQUEFACTION PLANT

19. During the Land Fitting Out Stage for the construction of the plant it has been estimated that the material to be removed will be 6,250,000 m³ and the material

to consolidate the foundations and bases of the new structures will be 1,155,000 m³. In this regard, please specify the following:

- 19.1 There is significant excess cut material. Indicate its final disposal, georeferenced location and environmental management plan specific for earthworks.

Response 19.1

The excavated material will be used for fill where suitable and the surplus will be deposited within the site and used to re-contour the site in accordance with the site grading plan and landscape plan that will be developed during the design phase. This material will be hauled and deposited in areas that will not affect the ongoing plant operations and local esthetics including areas visible from the public roads. See Chapter II, Section 3.2.1 for additional information and description. Section 4.2.1 of Chapter V presents the programs that will be established during the construction phase which include site preparation and disposal of excess fill associated with the site preparation (module AC-4).

- 19.2 The construction material that will be used to consolidate the foundations and bases of the plant structures is significant. Indicate the borrow areas from where said construction material will be obtained, the lithographic characteristics thereof and location in a georeferenced map. This activity could also distort the local market price. Indicate what measures the company will adopt in the event of a significant change in price and submit an estimate of the monthly borrow material consumed.

Response 19.2

The design grades associated with the Plant site indicate that a surplus of fill will be available for use at the LNG Plant site and therefore very little fill is anticipated for use in site preparation for foundations and roadway bases. A significant amount of specialty raw materials such as rock aggregate for concrete and road base and other civil applications will be obtained from local commercial suppliers that are properly authorized as described in Section 3.4 of Chapter II. It is planned for the main construction contractors to purchase these supplies from contractors in the local market. It is also expected that several suppliers will be used to distribute this sub-contract work to local contractors and to assure a regular supply for any upsets in delivery for such reasons as machinery breakdowns – this means that excess supply capacity will be available to continue service for the normal demand in the region and avoid significant changes in prices. The detailed designs will be prepared by the EPC contractor at a later stage but based on the conceptual designs and quantities and cost estimates prepared to review the feasibility of the project indicate that over 100,000 tonnes of material will be imported to the site.

The breakwater will require select material consisting of quarry run rock material up to 3 tonne size with filter rock and exposed layers made up of rock varying from 3 to 10 tonne size. As described in Section 2.2.2 of Chapter II, the total in-place volume of rock required for the breakwater is 1,200,000 m³. This material will be obtained from either existing quarries or a newly permitted and approved quarry that have undergone an EIA.

- 19.3 Water consumption during the construction stage will serve for dust control, soil compacting, concrete mixing and sanitary services, which will be extracted from the Cañete River. Submit the hydrological study of the Cañete River, which must determine the maximum and minimum water volume per month during the period of water supply from the Cañete River for the project's construction.

Response 19.3

Based on the information provided in Sections 3.1.5 and 3.4 of Chapter II, water from the Cañete River will be withdrawn during the first year of construction while the desalinization plant is completed. The estimated volume of water consumption during the construction phase that will be used from the river is 200 cubic meters per day (also, see page 42 of Chapter IV). Hydrological information on the Cañete River is provided in Section 2.4.1 of Chapter III (pages 2-9 to 2-10 and Table 2-4). The information gathered indicates that minimum flow rates observed during dry season were 7.8 cubic meters per second (September, 1997) and maximum flow rate during rainy season were 334,8 cubic meters per second (February, 1994). Proposed water management measures and monitoring during construction stage are provided in Chapter V data sheets AC-1, AC-4, AC-5 and SM-2. Approval will be sought for water withdrawals, location, and volume, while avoiding conflicts with the local users of this resource, monitoring usage and conducting monthly bacteriological and physical-chemical quality monitoring. A copy of the documents obtained from SENAMHI, which include the minimum, and maximum mid level of discharge in Toma Socsi- Cañete River is attached. From this data, and considering the very low volume of water that will be withdrawn, it will not affect the normal conditions of the river.

- 19.4 Toilets for personnel will be distributed according to the number and location of the personnel. This means that the company will use chemical toilets, which will be removed by the company providing this service or a treatment plant will be installed for all toilets. If so, submit the design of the Plant, maximum treatment capacity, monitoring program, Maximum Permissible Limits, and Sludge Management Plan.

Response 19.4

During the construction phase the temporary camp facilities that will house the workers will be self-sufficient and will include sanitary wastewater collection and treatment as described in Section 3.1.1 of Chapter II. Portable chemical toilets will also be utilized and will be collected and disposed by a licensed disposal subcontractor. Sanitary waste from the plant area and employee camp area during the operation phase will be treated in packaged treatment units (2 units as presented in Figure 22 on Chapter II), where the wastewater will undergo biological oxidation, clarification and aeration. Treated effluent will be used for irrigation purposes as described in Section 2.3.11.4 of Chapter II or disposed at sea under Peruvian permit. The packaged treatment plant will be designed to treat a volume of sanitary waste generated by the LNG plant and permanent camp has a design capacity of 30 and 50 m³/day respectively. The effluent will be monitored to ensure compliance with the World Bank Guidelines as presented in Section 4.2.2 of Chapter V (module SO-2 and Figure SO-2.1). Chapter V provides the management plan (MR-1) that establishes the procedures and guidelines for the

management of wastewater generated during the construction and module, RO-1, for the operation phase of the project as well as the management of sludge from the treatment units.

USE OF PORTABLE TOILETS BY THE PERSONNEL

This service is related to the integral management and disposal of wastes, to thus protect and preserve the quality of the environment, in accordance with the Environmental, Health and Safety Policy, Peru's Regulations, and the recommendations made by International Organizations.

This service will be provided in accordance with the guidelines set forth in the General Health Law N° 26842 and the Sanitary Regulations for Environmental Sanitation Activities approved by means of Supreme Decree No. 022-2201-SA. The company to be finally selected to provide this service must guarantee that it has been formally incorporated and is in a capacity to properly manage wastes. In addition, it should have obtained the necessary authorizations to thus offer appropriate sanitary conditions to the workers.

The use of portable toilets on a permanent basis and in a given area will be limited to 20 users per day.

PORTABLE TOILET MAINTENANCE:

Portable Toilet Cleaning and Maintenance shall abide by the following rules and definitions:

Definition of Portable Toilets.

Portable Toilet shall be understood to mean a small cubicle or toilet unit installed in places where sewer- connected sanitation is not available, in order to provide sanitary facilities for the people's comfort and convenience.

How do they work

To operate, portable toilets require a biodegradable liquid compound that is mixed with water to form a solution that controls odors and the biologic activity of wastes. The liquid compound is mixed with 20 liters of water, to thus comply with the specifications of the detergent's manufacturer and guarantee that the product is inoffensive for treatment plants.

Characteristics

Portable toilets are made of highly-resistant material, either injected plastic or fiber glass. A portable toilet looks like a personal booth, its minimum size being 1.0 x 1.0 x 2.00 m. The toilet tank should have an appropriate capacity (200 liters).

Cleaning Frequency

If a portable toilet is used by 20 people, then it should be serviced twice or three times a week, as on the third day it will have reached 50% of its total capacity.

A portable toilet should also be cleaned if there is an imminent risk of contracting infectious diseases.

Portable Toilet Cleaning

To clean a portable toilet, the following steps should be taken:

To install portable toilets in any given area, attention should be given to existing access facilities.

- The toilet service should be suspended until cleaning work has been completed.
- Used toilet paper (waste bags should be tightly closed and removed) and other objects disposed of inside the portable toilet unit should be removed.
- Wastes stored in the portable toilet tank should be pumped into the truck holding tank.
- The interior of the toilet should be cleaned by scrubbing with a brush and water.
- The mixture should then be prepared (4 oz of detergent mixed with 20 liters of water). Using a plastic broom, a small amount of the mixture should be used to wash the interior, that is, walls, floors and the bowl.
- The toilet should then be flushed using the rest of the mixture. (approx. 19 liters)
- A deodorizer can then be used.

20. The heaviest mobilization of machinery, equipment and material will be in the section of the South Pan-American Highway from Pisco to Pampa Melchorita, and to a lesser extent, the South Pan-American Highway between Lima and Pampa Melchorita. The company must:

20.1 Undertake to repair any damage to the referred section of the Pan-American Highway which may have been caused by its transportation activities;

Response 20.1

Transportation will only be made in accordance with the requirements and within the plans stated by permits. A detailed condition survey of the roads to be used will be made before and after the construction activities whereby any damage can be clearly assessed.

20.2 Present the inventory of roads to be used, accompanied by photographic records of the main structures and their current status;

Response 20.2

A detailed preconstruction survey and transport plan will be made in accordance with MTC requirements as detailed in Management Plan GS-2 included in Chapter V of the EIA. As mentioned in the response to observation 8, most of the equipment and materials that will be used during the construction phase will arrive at the Port of San Martin in Pisco and be transported to the Project site. Additionally, a small portion of the shipments will arrive at the Port of Callao in Lima. Therefore, it is presumed that the roads to be used for the transportation of machinery, equipment and materials include the route between Pisco and Pampa Melchorita (Km. 167) over the South Pan-American Highway and to a lesser extent the South Pan-American Highway between Lima and Pampa Melchorita. Additionally, mobilization of personnel will mainly use the South Pan-American Highway between the localities of Chincha and San Vicente de Cañete to Pampa Melchorita (Km. 167). (Vol. I, Chapter V, Module AC - 2)

20.3 Submit the Procedure for the transportation of Heavy Loads;

Response 20.3

A permit application will be made for every load that is more than 48 Tm in weight (or more than the normal operating capacity of any bridge, culvert or other structure – for example 4 bridges and 2 culverts between Pisco and Melchorita have a posted maximum load of 36 T) or exceeding the standard measurements of 12m L x 3.4 m W x 3.4 m H. The application will include the drawings of the load, final weights and dimensions, an engineering study to show any modifications needed, requirements for raising aerial cables and the procedure for escort vehicles, timing, etc. Police vehicles, signaling equipment, additional escort vehicles, safety representative, and mechanic's truck and helpers will escort each convoy.

20.4 Submit a table with light and heavy loads of equipment and machinery;

Response 20.4

PLNG estimates that approximately 200,000 tonnes of material will be transported to the site. A related table is supplied in the answer to observation 20.7.

20.5 Describe and give the location of the place where equipment and machinery will be washed and prepare the specific Environmental Management Plan.

Response 20.5

Equipment will normally be washed either at the Peruvian transportation sub-contractors base facility or at the maintenance facility located at the Pampa Melchorita site.

Wastewater discharges associated with equipment washdown or activities resulting in surface water coming in contact with the plant area or with oil or suspended solids within the plant area will be routed to the segregated wastewater sewer system.

These segregated wastewater sewer systems will be provided for drainage and collection of wastewater sources to allow necessary treatment to meet Peruvian Effluent Standards and World Bank Effluent Guidelines or best available technology where no guideline exists. Specifically, runoff from equipment washdown areas and other sources of potentially contaminated wastewater will be channeled to an American Petroleum Institute (API) gravity type oil – water separator where free oil will be skimmed off to a collection sump. The separator will be designed to treat peak flows corresponding to rainfall or firewater discharge rates. The major source of contamination will be oil and grease from gas turbine, compressor, pump machinery areas and wastewater from these areas will be treated in a Coalescing Plate Interceptor (CPI) oil separator prior to entering the API separator along with the plant surface runoff.

Potentially contaminated surface runoff from remote areas such as the Trestle, Cargo Dock and Seawater Intake will be diverted to containment sumps. A vacuum truck will empty any contaminated wastewater from these sumps for transfer to the CPI separator.

Washing of machinery, equipment and vehicles will be forbidden in areas that do not drain to the segregated wastewater sewer system or containment sumps.

- 20.6 Submit a copy of the permit and of the docket approved by the Ministry of Transport for the circulation of its vehicles;

Response 20.6

Permit applications will be prepared and submitted to the MOT by the transportation sub-contractor once they are appointed and the detailed schedule is known. Engineering studies and transportation plans will be provided to support the permit application for heavy and oversize loads.

- 20.7 Submit a table with weights or loads of the equipment, machinery and consumables that will be transported along the roads mentioned above;

Response 20.7

PLNG estimates that approximately 200,000 tons of material will be transported to the site from international and local sources. The majority of the loads will be transported by standard heavy-duty highway equipment with around 15 to 20 tons of payload each. The total estimated weight of cargo to be moved to the site includes the following list of special heavy loads.

Equipment	Weight (tons)
AGR Absorber	545
MCHE	272
Propane Compressor Skid	225
Heavy Metal Absorber	203
HP MR Separator	139
2 Ea. Frame 7 Gas Turbine Driver Skids	137 Ea.
2 Ea. Propane Storage Bullet	125 Ea.
3 Ea. Generators	100 Ea.
2 Ea. Ethylene Storage Bullets	100 Ea.
MP MR Compressor	92
LP MR Compressor	92

See also Response 20.4.

- 20.8 Taking into account that during the summertime the local population goes to beach more frequently on Saturdays and Sundays and less frequently from Monday to Friday, indicate the timetables, frequency and number of units that will circulate along the routes previously selected and the mechanisms to inform the population.

Response 20.8

A detailed schedule for transportation is not possible at this feasibility stage of the project but the impact and safety issues regarding public use of the main roads is a key consideration in planning the transportation program. Generally, it is planned to avoid restricting normal traffic patterns where possible. Details of vehicle safety, alerting the public, signs, etc is provided in Vol.1, Chapter V, Module AC-2.

21. The Closure Plan submitted does not guarantee the restoration and reshaping of the land impacted by the Gas Exportation activity to its natural state. The company plans to convert the area in an industrial zone or use it for other purposes. It is necessary for the company to undertake to reclaim and reshape the land to its natural state or that the purpose for which the facilities will be used are in line with the Master Plan of the locality, the government and the local civil society.

Response 21

PLNG recommends that the land be left in a suitable condition for future industrial or commercial activities as administered by the local master plan. Reshaping the land to a natural state will greatly decrease its value to future users and will not benefit the District. All equipment and structures will be removed as required by the locality and the plant area left in as clear level site with roads for future users. It should be noted that only the process, tank, maintenance and housing areas will be graded to provide level work areas and the majority of the total site area will not be graded and will be left in its natural state.

22. The company's future Growth Plans include the expansion of the Plant in view that it has an area available for this, but it has not taken into account whether in the Municipality's Master Plan this area is designated as an industrial expansion area. Indicate the technical criteria that allows assuming the possibility of increasing the plant's capacity.

Response 22

There is space within the proposed land area to install additional process equipment and a storage tank for a plant expansion without the need to purchase or rezone any new land areas. Although space has been made available in the layout of the train for the LNG plant as referenced in Section 1.5 of Chapter II (page 4), no investment has been made for a second train for the plant. Any investment would first require the submittal and approval of another EIA for expansion from the first train in the LNG plant. PLNG has no plans to expand the process area or the land area at this time and is not included in this EIA. See Observation 112

23. The parameters and criteria to evaluate the Site Selection indicate "Exclude areas where fitting out the land entails considerable difficulties". In this regard, explain what the considerable difficulties are.

Response 23

The results of a site selection survey conducted in October 2001 are shown in Attachment 23A evaluating 17 sites along the coastline of Peru between Paracas and Lima. The survey recommended that three sites: 1) Pampa Clarita located along the coastal side of the South Pan American Highway at Km 154, 2) Punta Corriente along with adjacent sites Playa Chepconde to Playa Gallarde at Km 117.66 to 122 and 3) Playa Melchorita at Km 162 be further evaluated through additional site investigation work in 2002 to select the best site for the LNG Plant. While investigating these sites, the early results from the Front End Engineering Design (FEED) work by Kellogg, Brown and Root (KBR) in 2002 indicated that the LNG site would require 150 hectares rather than the 100 hectares initially estimated. To meet this additional requirement for land space and because of social issues, PLNG decided to move south, to the location

called "Pampa Melchorita". Attachment 23B provides a report on the results of the 2002 site investigation work and selection of the site of Pampa Melchorita at Km 167.

The "considerable difficulties" allude to the additional site preparation work entailing 6,250,000 m³ of excavation and the 3.5 kilometers, 5 degree grade plant road that must be built from the 135 plant site elevation to the trestle abutment at 7 meters elevation. This adds to the cost of the project, but has no effect on the environmental aspects of this project as there is sufficient space for on site spoil and cut disposal to the north of the plant site.

24. The company points out that "Pampa Melchorita was considered the third most probable site for the Project, but was not initially selected as the preferred site due to its altitude of 135 meters above sea level, which requires a significant access road to the coast". Explain why it is necessary to build a significant road.

Response 24

The design for road from the plant area at an elevation of 135 masl to the sea will be primarily governed by the construction requirements with additional minor features (such as lighting) that will be designed to cater for the needs of ongoing operations. The key criteria during construction is to have safe access for construction equipment and materials to be delivered for the jetty construction from the land – accordingly, the slope on the road will be 5% or less with large radius turns for heavy loads and enough space for vehicles to pass in opposite directions. The road will be very suitable to allow vehicle access for the operators, government custom agents, harbormaster or any other staff during the day or night in all weather conditions for the life of plant.

25. Activated aMDEA will be used to remove carbon dioxide, which is specified in the study as not being a toxic or corrosive solution. Describe the aMDEA regeneration procedure and indicate how the waste resulting from this process will be finally disposed of; and explain why the aMDEA manufacturer indicates that contact with the eyes or skin may result in moderate irritation, which means that it is hazardous for man and is considered as a toxic solution. However, in the description of the process it is not considered as such.

Response 25

Activated methyl diethanol amine (aMDEA), is a tertiary amine that will be used to remove the CO₂ in the feed gas from 0.57 mol% to 50 ppm. The word "Activated" means that it contains a small amount of catalyst or synergist that allows the aMDEA to achieve the removal of CO₂ to the desired levels. aMDEA It has a greater capacity to react with acid gas because it can be used in higher concentrations. It has been demonstrated that corrosion can be minimized with proper operating conditions.

During the operation of aMDEA no degradation compounds occurs and no waste is generated. Activated aMDEA is biodegradable. The CO₂ removal occurs in an Acid Gas Removal Unit (AGRU). A simplified description of the AGRU operation is as follows: The CO₂ is removed in an AGRU operating in closed loop. Regenerated aMDEA will remove the CO₂ from the natural feed gas in an absorption column. The absorbed CO₂ will be removed in a regeneration column. Heat added to the reboiler of the regeneration column will be the driving energy needed for the removal of CO₂.

Bottoms temperature of the regeneration column will be 110 °C, far away from the beginning degradation of aMDEA at approximately 200 °C.

Activated MDEA has no chronic exposure effects; however, contact with the eyes and skin may result in moderate irritation. Washing affected areas with water and soap or rinsing the eyes with water is recommended. In order to avoid this potential irritation, personnel handling aMDEA will be required to wear gloves, chemical goggles, and other related personal protection equipment. Shower and eye washer stations will be located at handling points. These personnel protective measures, combined with the fact that the AGRU is a closed system and the aMDEA is recirculated in the closed system, effectively mitigates any potential human health hazards associated with this material, however slight they might be.

26. During the operations stage it has been contemplated to implement two dry gas and wet gas flare stacks. The company must:

26.1 Submit the design of the Dry Gas Flare Stack and of the Wet Gas Flare Stack.

Response 26.1

The Wet Flare is provided for the reliable and safe disposal of wet hydrocarbon streams that result from upsets and emergencies. The design case is for the relief rate required by the failed open control valve on the liquid outlet line of the Acid Gas Removal Unit Absorber. Design flow of the Wet Flare system is 159,000 kg/hr. The Dry Flare is provided for the reliable and safe disposal of light dry gas and liquid hydrocarbon streams that result from upset and emergencies. The design flow rate of the Dry Flare is 2,030,000 kg/h required for the blocked outlet on the propane compressor discharge. The design of each of the Dry and Wet Flares are for an allowable radiation of 6.31kW/m² at a 159 meters radius (including solar radiation of 0.82 kW/m²) or 1.58 kW/m at the property line including solar radiation. Both flares will be derrick-supported, non-assisted, and located together in the same derrick structure in the common area. The stack height of either flare will be the same to minimize flame impingement to the stacks. Minimum stack high will be 150 meters.

26.2 Indicate the technical, environmental and landscape considerations for the location of the flares.

Response 26.2

The flares are considered safety protection for equipment and personnel to ensure that overpressure of hydrocarbon piping and vessels will not cause damage to personnel and equipment. Flaring is not required during normal operations. The flares are safety protection and will only be used in emergency situations and for limited times during plant start-up and shutdown periods. The flare stacks will be located 660 m from the beach line, one kilometer from the property line on the north side, and 1.5 kilometer from the Pan American Highway. The flares will be located in the northwest side of the LNG plant due to prevailing winds from the southwest direction for safety purpose. This location will prevent uncontrolled burning of an accidental hydrocarbon release to protect equipment and personnel. From an environmental basis, the maximum flare volumes have been analyzed for thermal radiation and emissions so that there is no harmful exposure outside of the LNG site boundaries. The flares have also been located far enough away from other equipment and personnel to prevent any damage

or harm under normal operations. The flares are located away from the highway for less visibility to traffic.

27. A subcomponent of the Gas Feed Receiving Unit is the Residual Collector tank from where vapors will be taken to the flaring and venting system. It is necessary to explain in what cases the venting system will be opened and when the vapors will be flared. Furthermore, indicate the minimum and maximum volume of emissions and their frequency, as well as the mitigation measures to minimize the emission.

Response 27

The venting system from the tank is provided to allow for disposal of any hydrocarbon gas in a safe and controlled manner. Liquids (water or hydrocarbon) are collected and natural gas that is in solution will be liberated at the reduced pressure in the collector tank. The amount of gas that is collected and disposed of to the flare is directly proportional to the amount of liquid that is collected. The system is set up for initial pipeline startup after hydrostatic testing operations and as a safeguard for any unforeseen pipeline upsets. Normally no liquid will be found in the feedgas inlet system so the gas from the Gas Feed Receiving Unit will be zero. The annual average gas rate from the Gas Feed Receiving Unit is expected to be zero.

28. The simulation of atmospheric emissions presented in chapter IV "Environmental Evaluation" presents the highest NO_x emission from the equipment Motor GT(KT-1410) to compressor LP/MP MR AND Motor GT (KT-1420) to HP MR/compressor at 40.4 kg/hr propane. If it is taken into account that the chemical composition of the fuel to be used will be the dry gas from Camisea, with a content of a hundredth, it does not justify the total volume of emissions. In this regard, it is necessary to explain this phenomenon and what measures will the company take to mitigate the impact.

Response 28

The gas turbine driver for the propane and multi-refrigerant (MR) compressors are General Electric Frame-7. These units are well known worldwide. The combustion gas for these gas turbines is natural gas from different sources in the liquefaction plant; it has a molecular weight of 17.85 and is composed of methane and ethane. Nitrogen oxides from the natural gas combustion in these gas turbines are emissions of two species of oxides of nitrogen: nitric oxide (NO) and nitrogen dioxide (NO₂), abbreviated as NO_x.

The pollutant emission data presented in Table 9 of Chapter IV represents the emissions associated with the firing of dry feed gas from the PLNG project. The conservative hourly emission of NO_x from either of the gas turbines Frame-7 is 40.4 kg/h. The emission data presented in the Table 9 represents the emissions associated with the combustion of natural gas and not propane and therefore the emissions and impacts presented in the EIA are correct. In this table, the maximum predicted concentration of nitrogen oxide (NO_x) in a 24-hour period expressed as NO₂ from all sources is 25.8 µg/m³, well below the World Bank Guidelines and U.S. Ambient Standards of 100 and below the Peru Ambient Standards of 200 µg/m³. Estimated NO_x at the Pampa Melchorita site during PLNG operation includes a background of NO_x concentration of 4 µg/m³.

For further information, please refer to Chapter IV, Environmental Assessment, Section 4, Table 9 – Stack, Operating, and Pollutant Emission Data for the Project Used in the Air Dispersion Modeling Analysis and to Table 10 – Maximum Pollutant Impacts Predicted for the Product Sources Using 1996 Meteorological Data from Pisco and Lima, Peru.

29. With regard to the baseline, it is required:

29.1 To submit the Wind Rose for the Gas Plant area showing information on the speed and direction of the wind throughout the day and the year.

Response 29.1

A meteorological weather station was installed at the study location in April 2003. See Response 155 for details of the data recorded. After this time, the same weather station is being managed within Peru and better presentation is being used showing data in tabular and graphical form to show the frequency of wind speed and direction. This information is shown in Attachment 29.1 and will be available on an ongoing basis. Data continues to be collected on ten second intervals throughout the day.

29.2 Submit a georeferenced map in the sampling points of the report on the quality of the air, water, soil and noise.

Response 29.2

Map EQ01 in Section IV of Chapter III presents the sampling locations for terrestrial activities of ambient air quality, baseline noise measurements and soil sampling. Map EQ02 presents the marine sampling locations for seawater and sediments.

29.3 Specify the vulnerable species and species nearing extinction found in the Plant Area.

Response 29.3

No endangered or threatened terrestrial fauna or flora listed in Peru's Supreme Decree No. 013-99-AG were encountered at the Project site as referenced in Section 3.1.1 and 3.1.2 of Chapter III (pages 3-2 and 3-3). *Tillandsia latifolia* an endemic plant of Peru are present at the plant site; however, this species is not considered endangered but will be managed in accordance to the Environmental Management Plan Module AC-4, Site Preparation. Some species of migratory birds, marine mammals and reptiles are occasionally reported or seen by fisherman in the project area, some of the species may be considered as threatened or endangered according to Chapter IV, Table 15 (page 49); but no feeding or reproductive grounds of any species were identified on the project site during baseline studies.

29.4 The company must undertake to submit the Final Noise Study, before starting its operations.

Response 29.4

The noise report included in Appendix 3 of Volume 2 of the EIA has been included as Attachment 29.4 and represents the final noise report. PLNG will conduct a noise monitoring survey to verify that the combined noise associated with the plant operations including the baseline noise comply with the World Bank Guidelines at the receptors identified in the EIA once the plant is operational.

30. With regard to the Environmental Management Plan:

30.1 Manufacturers of machinery and equipment recommend technical specifications for their maintenance and normal operation. The company must undertake to strictly comply with the recommendations given for each piece of machinery and equipment working in the project area. Also, submit these technical specifications for their respective verification in the field by OSINERG and the DGAA of the MEM.

Response 30.1

It is standard operating practice and also Peru LNG's intention to operate and maintain machinery in accordance with the Original Equipment Manufacturer's recommendations. These recommendations and Peru LNG's planned maintenance program can be reviewed by OSINERG and DGAA upon approval of the project, completion of final engineering design and equipment selection prior to plant start-up.

30.2 Explain how you will minimize the impact of venting or flaring during the start-up of the plant.

Response 30.2

During commissioning and start-up of the machinery, some trips and shutdowns can be expected. This loss will be minimized by conducting extensive pre-commissioning tests on all of the machinery and control systems prior to the drying and cool down procedures. Inlet feed gas will be used for drying out and cooling down of the plant. This will be clean, processed natural gas from the pipeline. Due to the extremely low operating temperatures of the LNG process (-160°C) all moisture must be removed from the plant equipment to prevent freezing during normal operations. The drying gas will be first passed thru the activated amine system and then thru the dehydration unit (molecular sieve). It will then pass thru the piping and equipment to remove moisture and then will be burned in the flare system. After thoroughly removing all moisture from the piping and process equipment, the plant will be slowly cooled down to the normal operating temperature of -160°C. When the process temperature reaches -160°C, LNG will be routed to storage and flaring will stop. The maximum rate of flaring will be 91,357 kg/hr of natural gas. This is the minimum flow rate required thru the activated amine absorber. It is estimated that the drying and cool down procedure will last 2 to 3 weeks. See Response 38 for further information.

30.3 Submit the water-proofing system that will be used in the fuel handling and storage area, chemical consumables, maintenance shops, liquid and solid waste storage, etc.

Response 30.3

The water-proofing system for containment areas will be lined with a compacted sand-bentonite seal installed over a compacted sand layer stabilized by adding 5% cement for good support. The sand-bentonite seal will then be capped with a 150 mm layer of sand-cement to protect the seal layer; areas that will be subjected to vehicle traffic such as the maintenance area or refueling pad will be capped with reinforced concrete designed to sustain the axle loads. This system will have a permeability of less than 10^{-6} cm/sec. Select areas such as chemical storage and used drum storage will use a high density polyethylene liner material over the sand-bentonite seal that is in turn covered with a sand-cement cap or a reinforced concrete cap. The method of sealing will include the berms, curbs and any collection points as applicable. The final design of each retention area or surface to be sealed will use a combination of these methods to best suit each application.

30.4 Submit the procedure to perform welding, cleaning and painting activities.

Response 30.4

Provided in Attachment 30.4 are the general procedures for welding, surface preparation, and painting. Detailed procedures will be submitted by the construction contractors and will be subject to approval before any work begins. During the construction phase, sandblasting will be the primary method of surface preparation for metal prior to coating. Sandblasting, welding, and painting will be in designated areas to facilitate the containment of residue. The residue from the sandblasting activity will be primarily sand and iron oxide (rust), as the metal being coated will be new, uncoated steel. This residue is non-toxic and could be disposed of onsite as well as at an approved landfill site. During the operations phase, it is expected that painting will be done on a limited basis as required to maintain the integrity of the external coatings. Typically, the surface preparation will be done by mechanical means (wire brush). Placing plastic sheets below the work area will contain the residue. The residue is then disposed of at an approved site. Welding waste will be stored in metallic containers and disposed in a licensed waste landfill. All wastes will be managed in accordance with Vol. 1, Chapter V. Module MR-2.

30.5 Submit the method chosen to scrape or sand down the walls of the tanks, pipes and others. The mitigation measures and final disposal of the wastes generated by the selected methods.

Response 30.5

During the construction phase, sandblasting or mechanical cleaning will be the primary means of surface preparation. The steel being cleaned will be new, uncoated steel. The residue from this process will be sand and iron oxide (rust). Sandblasting will be conducted in a specified area so that the residue and airborne sand can be controlled. People working in the sandblasting area will be issued proper protective gear (eye goggles, air masks, gloves, etc.). During the operations phase it is expected that painting will be done on a limited basis as necessary to maintain the integrity of the external coatings. Surface preparation will be done by mechanical means (wire brush). Plastic sheets will be placed below the work area to contain the residue. The residue will be collected and disposed of at an approved disposal site. During the operations phase, it is not expected that any vessels or tanks will need to be cleaned internally. All wastes will be managed in accordance with Vol. 1, Chapter V. Module MR-2.

- 30.6 Indicate how the liquid wastes from the developing of radiographic film will be disposed of.

Response 30.6

A contractor will carry out non-destructive testing on site using radiographic film. The film will be sent to PLNG files for future reference. No liquid waste will remain onsite. Liquid wastes originating from onsite developing of radiographic film will be transported by the subcontractor to an authorized sanitary field inside containers in vans or trucks with closed body equipped with the necessary safety devices to prevent liquids from moving or spilling. The disposal site will meet DIGESA standards for final deposition inside encapsulated cells, covered with appropriate cover material, and then finally closed.

- 30.7 Submit an undertaking that upon commencement of the operations, company will submit to the DGAA complementary information on the characteristics of the control points for the monitoring of gaseous and liquid emissions, air quality and noise in accordance with the attached SIA form.

Response 30.7

PLNG will submit monthly monitoring reports upon commencement of operations of various parameters as designated in the Environmental Management Plan modules in the format and form of the attached ENVIRONMENTAL AND SOCIAL MONITORING AND AUDIT OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE COMPANY PERU LNG SRL, MONTHLY REPORT (Annex 1).

- 30.8 Provide the list of chemicals that will be used during the plant's operations, differentiating which are dangerous and which are not. Include the management plan for these materials during transportation, storage, handling and final disposal.

Response 30.8

Below is a list of chemicals that will be utilized at the plant and identifies those that are classified as hazardous and the associated hazard classification. Appendix 1 of Volume 2 of the EIA provides Material Safety Modules (MSDS) for the various chemicals that will be utilized at the Plant. These MSDS generally provide information characterizing the product and the potential hazards and methods for handling. The management of both liquid and solid waste including the handling, storage, and disposal of these materials is included in Chapter V, Modules RO-1 and RO-2. Prior to commencing operations, the more specific plan will be developed that will identify the design of the structures that will house all hazardous materials and will include site specific management plan and personnel training.

The chemicals to be used during the plant's operation include: Paint during construction and maintenance – non hazardous
Paint Solvents during construction and maintenance – hazardous and non hazardous
Methane - process into liquid - hazardous
Lubricating oils for compressors, pumps, autos, trucks - non hazardous
Methyl alcohol - hazardous

Activated Methyl Diethanolamine – non hazardous
Amerel 1500 foam control agent – non hazardous
Molecular sieve (type 4A) – non hazardous
Sulfur impregnated activated carbon HGR 4x10 – non hazardous
Ethylene - hazardous
Propane - hazardous
Therminol 55 heat transfer fluid – non hazardous
Diesel fuel - hazardous
Gasoline - hazardous
Sodium Hypochlorite - hazardous
Resin bed for E-cell – non hazardous

Attachments 38 A and B are the Material Safety Data Sheet for two components that are also going to be used in the plant “Agente para el control de Espuma- Amerel 1500” and Carbono activado impregnado de azufre HGR 4x10.

31. Indicate what the regulations will be for the Maximum Permissible Limits for soil quality in Total Petroleum Hydrocarbons.

Response 31

Soil is considered contaminated if any fraction contains greater than 5.0% by weight TPH (Total Petroleum Hydrocarbon). Contaminated soil must be removed, treated or remediated in accordance to Peruvian or international standards to get below this level.

32. The oil that will be used as heat agent for the gas process will lose its physical and chemical properties from time to time and it will be necessary to change it, there being no treatment in Peru for this type of waste. It is necessary for the company to undertake to withdraw it from Peru. Also, submit a contract and/or agreement signed with the company in charge of this.

Response 32

The heating medium will be Therminol 55 manufactured by Solutia. Therminol 55 is synthetic oil designed specifically for heating medium application. This heating medium is designed to operate for long periods (years) at 290° C without degradation. Our system will operate at 170°C, well below the extended maximum use temperature of 315 °C; therefore, no degradation is expected for 15 years or more. Additionally, Solutia offers a return program in the event that it becomes necessary to replace the heating medium. The oil would be sealed in metal drums and returned to Solutia for disposal. A contract for return of the heating medium will not be possible until the fluid is actually purchased. This oil could also be disposed in the onsite incinerator.

33. The electrical power generation and distribution systems will require a fuel source. In this regard, indicate the type of fuel to be used and the approximate volume to be consumed during the construction and operations stage.

Response 33

The main electrical power generators during operations will be fueled by natural gas supplied from the gas inlet area or the plant. This is the same fuel that will be available

in Lima for household cooking or industrial power generation. During construction, diesel generators will be used to produce power for the camps, offices and workshops. It can be roughly estimated that up to 6,000 liters per day of diesel will be used at the peak of construction and staff level over a period of 18 months.

34. Submit the Environmental Management Plan for Transportation and Storage of chemical consumables, such as propane, ethylene and others.

Response 34

As described in section 2.1.7 of Chapter II, refrigerants such as propane and ethylene will be transported on specialized trucks to the plant. Transportation of these and all other chemical consumables will generally comply with best industry practice, but at a minimum will meet all government hazardous cargo signage or placarding and manifesting requirements and all World Bank guidelines for safe chemical transport. In addition, contract haulers transporting hazardous materials will be initially and periodically audited to verify that all transport vehicles and methods meet these requirements and that all drivers have received adequate training and any needed certifications.

The following chemicals are expected to be used in the process and utilities areas of the LNG Plant.

Area	Chemical
Inlet Area	Methyl Alcohol
Acid Gas Removal	activated Methyl Diethanolamine (aMDEA) Amerel 1500 foam control agent
Dehydration	Molecular Sieve (Type 4A)
Heavy Metal Removal	Sulfur impregnated activated carbon HGR 4X10
Refrigerant Storage	Ethylene Ethylene, refrigerated liquid Propane Propane, refrigerated liquid
Hot Oil System	Therminol 55 heat transfer fluid
Diesel Fuel System	Diesel fuel
Fuel	Gasoline, Diesel
Water System	Sodium Hypochlorite Resin bed for E-cell
Wastewater System	Sodium Hypochlorite
Other	Solvents, paints, lube oils,

Propane and ethylene will be stored at the plant in “bullet” type tanks. Two tanks with a storage capacity of 602 cubic meters each for propane and 2 tanks with a storage capacity of 200 cubic meters each for ethylene.

Material Safety Modules (MSDS) will be kept for all chemicals transported and for any primary chemicals to be stored, manufactured or used at the Plant.

Containment areas will be lined with a compacted sand-bentonite seal installed over a compacted sand layer stabilized by adding 5% cement for good support. The sand-bentonite seal will then be capped with a 150 mm layer of sand-cement to protect the seal layer. Areas that will subject to vehicle traffic such as bulk the chemical unloading

and storage pads will be capped with reinforced concrete designed to sustain maximum expected axle loads. Areas for chemical and used drum storage will utilize a high density polyethylene liner material over the sand-bentonite seal that is in turn covered with a sand-cement cap or a reinforced concrete cap. The method of sealing will include berms, curbs and any collection points as applicable. The final design of each retention area or surface to be sealed will use a combination of these methods to best suit each application.

35. Submit the soil quality monitoring plan for the area where the chemical consumables will be stored.

Response 35

Chemical storage areas and associated operating guidelines will be designed to provide appropriate spill prevention and containment, with all spilled material being reclaimed and recycled or collected for treatment or approved disposal, in that order of preference. Although the need for soil sampling has been minimized by the inherent design of the plant, in the event of a spill that does result in potential soil contamination, sampling protocols complying with government standards and best industry practices will be employed to identify the level of contamination and needed remediation methodology. In addition, because of the inherent design of the facility for spill containment and management, specific soil sampling locations will be identified on a case-by-case basis. However, the facility will always be prepared to respond with trained spill response personnel and adequate equipment to mitigate any impacts associated with such events. All areas of the plant will be visually monitored on a daily basis and action taken in case of spills.

36. Submit a georeferenced map for each of the civil works, such as non-industrial and industrial drainage and containment berms.

Response 36

This is not available at this stage of the project. This will be developed as part of detailed design and engineering. Sealing methods as described in Responses 37 and 30.3 will be used.

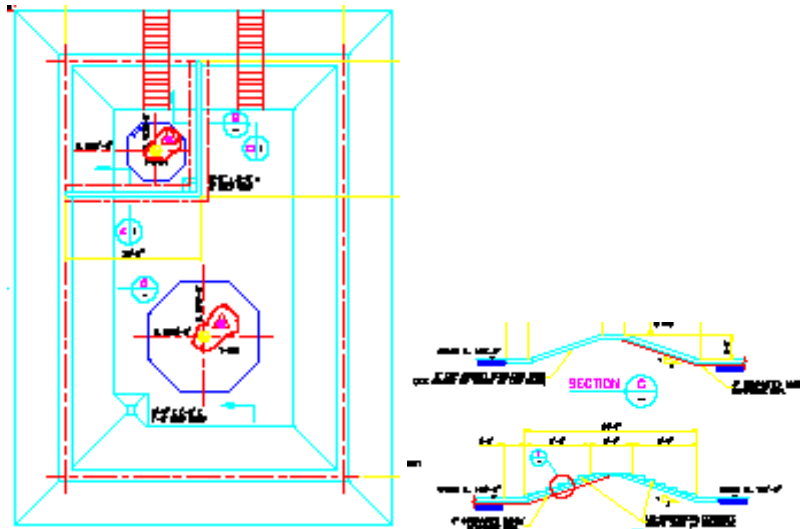
37. Submit the design for the water-proofing system of the liquid fuel storage tank.

Response 37

The water-proofing system for containment areas will be lined with a compacted sand-bentonite seal installed over a compacted sand layer stabilized by adding 5% cement for good support. The sand-bentonite seal will then be capped with a 150 mm layer of sand-cement to protect the seal layer; areas that will be subjected to vehicle traffic such as the maintenance area or refueling pad will be capped with reinforced concrete designed to sustain the axle loads.

A standard design for a fuel storage area is shown below. This design includes a bund wall sized to contain 110% of all liquid stored with a separate interior bund for the small gasoline storage tank. Note that a low point sump is provided in each spill containment area to facilitate any cleanup activity. The seal is made up of a sand-bentonite seal as discussed above throughout the base of the containment area and the interior sides of

the bund walls. The seal is capped with sand-cement protective layer to provide permanent protection of the water-proofing system. Steps are provided for easy and safe personnel traffic.



38. Indicate the maximum emissions that will be generated during the start-up and operation of the plant in the wet venting and dry venting systems. Also indicate what operating measures will be taken to minimize the emission of these gases into the atmosphere.

Response 38

During commissioning and start-up of the machinery, some trips and shutdowns are expected. This loss will be minimized by conducting extensive pre-commissioning tests on all of the machinery and control systems prior to the drying and cool down procedures. Inlet feed gas will be used for drying out and cooling down of the plant. This will be clean, processed natural gas from the pipeline. Due to the extremely low operating temperatures of the LNG process (-160°C) all moisture must be removed from the plant equipment and piping to prevent freezing during normal operations. The drying gas will be passed thru the piping and equipment to remove moisture and then will be burned in the flare system. After thoroughly removing all moisture from the piping and process equipment, the plant will be slowly cooled down to the normal operating temperature of -160°C . When the process temperature reaches -160°C , LNG will be routed to storage and flaring will stop. It is estimated that the drying and cool down procedure will last 2-3 weeks. The rate of flaring will be very low in the beginning of this procedure and reach the maximum rate near the end of the procedure. The maximum emissions rate (NO_x , CO , and VOC) will be 1,068 kg/hr based upon a natural gas flare rate of 91,357 kg/hr. This corresponds to the minimum flow rate required for proper operation of the activated amine absorber. The maximum emissions rate during the dry out and cool down procedure has been modeled using the same modeling approach performed for the previous analysis. The results are well within World Bank, U.S. and Peruvian ambient air standards and guidelines. Please see Attachments 38a and 38b for air quality modeling results.

CAMP

39. The project contemplates the construction of a permanent camp. The company must:

39.1 Indicate the maximum number of workers who will be employed in the plant during the construction stage.

Response 39.1

During the operations stage, around 150 persons will be employed at the plant. This number will increase on a temporary basis when additional crews of around 20 to 30 persons would be added during the summer seasons and a larger increase of around 50 to 75 when special planned maintenance would be conducted. Please refer to Volume I, Chapter II, Section 4.2 for more discussion of this topic.

39.2 Submit the camp design and include all its facilities.

Response 39.2

The buildings in the permanent community contain the following:

- Management Staff Housing: there are 14 units, 3 bedrooms, kitchen, etc suitable for families. Each unit is around 200 m2 size.
- Senior Rotation Staff Housing: there are 60 units build in five groups or 12. Each unit is for 1 person with a private bathroom. Each unit is 33 m2 size.
- Junior Rotation Staff Housing: there are 60 units in groups of 20. Each unit can be set up with 1 or 2 beds per room and private bathroom to permit maximum flexibility. Each unit is 25 m2.
- Dining Hall / Kitchen: The dining hall will have seating 180 persons at one time. The kitchen area will include high quality restaurant equipment for food storage, baking, cooking and cleaning. The total size is 650 m2.
- Community Recreation Building: This building includes the laundry in the total 360 m2 unit. Exercise equipment, table games, television rooms and lounge areas are included.
- Medical Clinic: This unit includes professional offices, examination rooms, overnight rooms, two emergency treatment areas, burn shower, equipment rooms and storage within a 240 m2 building.
- Community Warehouse: A 450 m2 building is provided with a workshop room for camp maintenance and extra storage for furniture and supplies in support of the camp operation.

All buildings will be permanent buildings installed on concrete slab foundation. All will be architecturally designed and high quality for reliable long-term operation in accordance with building codes. Housing units and the clinic will be masonry walls with stucco finish. The remaining larger buildings may be steel frame structures for large clear interior spans with metal external walls. The Engineering and Construction contractor will prepare final design and drawings.

Cleaning squads will be formed for daily collection, classification, storing and shipping of solid wastes generated in work areas and camps. The contractor's environmental inspector will be trained to identify the types of waste. If there are any doubts regarding the classification it will be regarded as hazardous. Waste will also be classified as recyclable and non-recyclable. Recyclable waste will be shipped to local or regional facilities. Recyclable material with monetary value (paper, aluminum, etc.) will be donated to local churches or other civic organizations. A record will be kept for all hazardous waste indicating the quantity, transporter and final destination of all hazardous wastes. Depending upon the type of waste, final disposal could be to an approved landfill, incineration, bio-remediation, recycling, etc. Special wastes such as car batteries, print cartridges, etc., will be returned to the supplier or authorized recycler. For further information please see Vol. 1, Chapter V, Modules MR-1, MR-2, RO-1, and RO-2 (Solid Waste Management) of the EIA.

- 39.5 Indicate what the maximum and minimum consumption of drinking water will be, taking into account the results of the Cañete River hydrological study. Also indicate what the drinking water quality standard will be.

Response 39.5

During the operation stage, the plant will not withdraw water from the Cañete River. As indicated at Section 2.3.10 of Chapter II a reverse osmosis unit will provide potable water from seawater at a rate of 30 cubic meters per hour. Out of this treated rate from desalinization plant, 12 cubic meters per hour will be sent to the potable water package unit (as discussed in Sections 2.3.10.2 and 2.3.10.3); this unit will have the capacity for treating water to a drinking standard at a rate of 17 cubic meters per hour. The drinking water quality of the treatment unit is established according to the World Health Organization and the US EPA.

- 39.6 The oil and grease trap will generate waste from time to time. It is necessary to indicate the Inspection Schedule as well as the company that will be in charge of collection, transportation and final disposal.

Response 39.6

The oil and grease traps will be inspected on a regular basis, at least once per week. The material will be collected and transported for reclamation offsite or incinerated onsite if the need arises. The contract for collection and recycling will not be submitted for bids until the project is approved. However, only local companies that are approved under Peruvian law to collect and recycle or reuse oils and greases will be allowed to bid for any such contracts.

- 39.7 Submit the Conduct Code for Workers.

Response 39.7

See Response 11 Attachment 11 for the Code of Conduct for Workers.

40. For the development of construction activities, the company has contemplated the implementation of temporary camps. The company must:

40.1 Indicate the maximum number of workers who will work in each of the temporary camps during the construction stage.

Response 40.1

There will be only one temporary camp during construction. The size will be small at the beginning of the work and will be expanded in steps prior to the time additional more staff arrives at the construction site. The camp will have the capacity to provide for 3,000 or more persons. The camp will be in service for more than three years – accordingly, the quality of the equipment, support utilities and installation must be very good to provide a comfortable, efficient and environmentally sound facility.

40.2 Submit the camp design and include all its facilities.

Response 40.2

The temporary construction camp will be designed and installed by the EPC contractor. The camp is expected to be modular design and include the following:

- Manager/Supervisors: Around 200 units with one bed per room and private bathroom.
- Senior / Technical Staff: Around 250 units with two beds per room. Two rooms will share one bathroom.
- Crafts: Beds for around 1500 persons with two beds per room.
- Junior: Beds for around 1300 persons with up to four per room.
- Senior Kitchen and Diner.
- Junior Kitchen and Diner.
- Senior Recreation Buildings: Includes television, exercise, lounge, and pool tables.
- Junior Recreation Buildings: Includes television, exercise, lounge, and pool tables.
- Units for Food Storage: Cold units and dry units.
- Laundry Buildings:
- Medical Clinic:
- Camp Offices:
- Power Plant: with diesel fuel storage, containment and distribution.
- Water Supply: Water storage tanks, treatment, pumps and buried distribution system. This system will be expanded in steps as the number of beds increase.
- Sewage: Modular aeration units with chlorination will treat sewage and gray water collected via a buried piping network. Units will be added as the number of beds in the camp is increased. The treated effluent will be to World Health Organization and US EPA standards and will be held in a holding tank or lined containment area and pumped to an irrigation area for disposal.

40.3 Describe the gray water and black water treatment plant that will be implemented; indicate the maximum and minimum effluent treatment capacity; the final disposal of wastes generated by the plant (sludge); estimate the maximum volume of liquid effluents generated per person; and the monitoring program.

Response 40.3

During construction the wastewater (black and gray) (sewage) generated will be treated through a package plant system with extended aeration. The maximum estimated water usage is 66 gal./person/day. A package treatment plant system will be used which will have an aeration chamber, secondary settler, sludge re-circulator, air diffusion system, disinfectant and discharge of clarified liquids. The clarified effluent can be disposed in the ground through an infiltration system or can be used for the irrigation of landscaped areas. This type of system can often work for several years without the necessity of removing sludge. Any sludge removed will be stabilized by one of several methods; dehydration, biological stabilization, or chemical stabilization that comply with US EPA standards for waste water systems. After being stabilized, sludge can be used as a soil amendment (fertilizer). Proper operation of the system will be monitored daily and inspected regularly by the onsite environmental inspector. The use of biosolids as a soil amendment is a US EPA approved method of treatment. For further information please see Vol. 1, Chapter V, Module MR-1 of the EIA.

40.4 Indicate how household and industrial solid wastes will be finally disposed of and their environmental management.

Response 40.4

Cleaning squads will be formed for daily collection, classification, storing and shipping of solid wastes generated in work areas and camps. The contractor's environmental inspector will be trained to identify the types of waste. If there are any doubts regarding the classification it will be regarded as hazardous. Waste will also be classified as recyclable and non-recyclable. Recyclable waste will be shipped to local or regional facilities. Recyclable material with monetary value (paper, aluminum, etc.) will be donated to local churches or other civic organizations. A record will be kept for all hazardous waste indicating the quantity, transporter and final destination of all hazardous wastes. Depending upon the type of waste, final disposal could be to an approved landfill, incineration, bio-remediation, recycling, etc. Special wastes such as car batteries, print cartridges, etc., will be returned to the supplier or authorized recycler. For further information please see Vol. 1, Chapter V, Modules MR-1, MR-2, RO-1, and RO-2 (Solid Waste Management) of the EIA.

40.5 Submit the characteristics of the temporary storage areas for non-biodegradable wastes.

Response 40.5

All solid waste will be temporarily stored in regularly inspected and approved containers, which prevent loss of material. Designated waste storage areas will be out of line of sight of the public access ways and designed to prevent contamination of area soils or immediate surroundings through the use of lined or concrete pads, fenced enclosures, etc. Accumulation of all waste will be tracked and waste storage areas regularly inspected to ensure that waste is removed from temporary storage in compliance with government regulations or in an otherwise timely manner. All plant facilities will undergo routine housekeeping inspections and any trash or unsightly debris collected and disposed of properly.

40.6 Provide a description of the personnel's dining area.

Response 40.6

The personnel dining area will consist of a single building designed to seat approximately 180 people. The building will be divided into two main areas, one area for dining and a separate area for food preparation. The food preparation area will consist of kitchen, freezers, food storage and an office for the catering supervisor. The dining area will consist of tables seating 6 to 8 people each, a serving counter, salad bar, drink dispensers, and restrooms. Hot food will be presented on a steam table. Employees will be able to choose from a selection of local Peruvian dishes and international dishes. There will also be a selection of salads, cold foods, and desserts. A partial list of kitchen equipment would include walk-in freezer, hot food server, cold food server, dishwasher, ice machine, refrigerator, fryer, oven, juice dispenser, stainless steel food preparation tables, and microwave oven. Please see Attachment 40.6, Floor plan for the proposed dining facility. Please note that this is not the final detailed design.

- 40.7 The oil and grease trap will generate waste from time to time. It is necessary to indicate the Inspection Schedule as well as the company that will be in charge of collection, transportation and final disposal.

Response 40.7

The oil and grease traps will be inspected on a regular basis, at least once per week. The material will be collected and transported for reclamation offsite or treatment onsite if the need arises. Any contract for collection and recycling offsite will not be submitted for bids until the project is approved. However, only local companies that are approved under Peruvian law to collect and recycle or reuse oils and greases will be allowed to bid for any such contracts.

41. Indicate what wastes or emissions will be generated by the cryogenic plant in obtaining nitrogen as well as the environmental management thereof.

Response 41

Nitrogen required during the operation of the Peru LNG plant will be from a cryogenic air separation unit. The cryogenic plant will cool and compress ambient air into the liquid state after drying and cleaning. Emissions from the unit will be mainly oxygen, argon and water, which will be returned to the air. Plant wastes will be managed by means stated in Vol. I, Chapter V, Module RO-1 and RO-2.

42. In the description of the hot oil storage tank the likelihood of encountering operating problems that could result in losses due to leaks and drainage during maintenance has been mentioned; in this regard, indicate the maximum volume that could be generated and the mitigation measures to address this.

Response 42

The hot oil storage tank when full will hold approximately 55 m³. This storage tank will sit inside an impervious containment area, sized to contain the entire volume of the tank should a leak occur. The oil would then be removed from the containment area and disposed of properly. The oil could be incinerated or shipped back to the manufacturer for disposal or reclamation. Hot oil circulation pumps will be fitted with double seals. If the primary seal fails, the secondary seal will prevent leakage until the

primary seal can be repaired. When necessary to perform pump maintenance, oil in the pump and associated piping will be drained into a container and will be either pumped back into the hot oil system or disposed of properly. The entire system will be continually monitored for leaks. Should a leak be detected, it will be immediately repaired and any spillage will be immediately cleaned up and disposed.

MARINE FACILITIES

43. Submit the Site Selection studies conducted along the Peruvian coast to identify the best location for the project. Include assessment criteria (Physical, socioeconomic, biological and cultural sensitivity) and the results thereof; information on the impacts upon the coastline and the loss of hydrobiological resources at the different levels, both in vertical and horizontal distribution.

Response 43

The site selection studies are provided in Attachments 23a, 23b and 23c as indicated in Response 23.

44. The study has not defined the direct area of influence of the marine component. In this sense, it is important to indicate the limits of this area, the criteria that has been taken into account in order to define it and to submit maps at an adequate scale.

Response 44

As indicated at the Executive Summary, Section 3.1 the area of influence for the study of the marine components of the project was define as a tract of sea delimited to the north by the southern bank of the Cañete River and its projection of 3 km west of the shoreline towards the sea, to the south to the northern bank of the Topara Creek and its projection of 3 km west towards the sea. This area was extended up to 10 km to the west to include area for disposal of dredge material. Criteria for defining the area of influence of the terrestrial and marine components of the EIA and corresponding mapping are provided in Section 1 of Chapter III, Volume 1 and at Appendix 6 of Volume 2.

The direct area of environmental influence of the project on the marine component is depicted on maps at scale of 1:25,000 presented at Chapter V in the following figures: SM-2.1, SM-5.1 and SM-6.1 marine monitoring stations for construction stage and figures SO-2.2, SO-3.1 and SO-4.1 marine monitoring stations for operation stage. This area consists of 7 km on the shoreline, distributed on 4.5 km to the north from trestle alignment and 2.5 km to the south; and a 2.5 km by 3.2 km rectangular area defined by trestle alignment and location of monitoring stations up to the -16 m contour line at sea bottom. The following is a list of those elements of the criteria utilized for definition of area of influence above:

- Location of projected structures and marine facilities such as trestle, navigational channel, breakwater and navigational and mooring aids.
- Area of influence of work activities during construction stage, and location of monitoring stations to measure and control potential effects as described on Chapter IV.

- Area of influence of constructed structures and potential effects as described on Chapter IV.

A map in the scale of 1:12,500 is provided as Attachment 44 represents the locations of structures and limits of the defined area.

45. The following is required with regard to the Baseline Study:

45.1 Submit a stability and physical risk map of the direct area of influence of the marine component.

Response 45.1

The stability risk map is submitted as Attachment 45.1

45.2 Indicate the ocean routes that will be used to build the subsea pipe.

Response 45.2

No subsea pipe is required for the Peru LNG Export Project. The trestle piping will be located on top of the trestle at an elevation of six to seven meters above sea level as described in further detail in the Project Description in Section 2.2.1 and construction in 3.1.4 and in graphic form in Figures 9, 10 and 13 of Chapter 2 of the Peru LNG Export Project EIA. The trestle pipe will be brought out on the trestle via a steel trestle road built on the trestle for transport during construction. That same road will be used for moving personnel, equipment and materials back and forth from the loading dock to the shore during plant operations.

46. In the description of the Breakwater, the company indicates that the site presents certain natural protection against the waves provided by the Paracas Peninsula located towards the south, but that it is exposed to long swell periods mainly coming from the southwest. This means that the construction of the breakwater could affect the Paracas Bay. In this regard, it is important to point out that due to the magnitude of the earthworks, the resuspension of sediments, disturbance of the seabed, loss of benthonic flora and fauna, and other possible impacts that will be generated by the construction of the breakwater, a detailed environmental analysis for this project component is required, which has not been included in this EIA.

Response 46

As described in Section 2.2.2 of Chapter II the natural protection provided by the Paracas Peninsula refers to the regional influence that this kind of geographic feature provides to the local oceanographic patterns of the project location. The Paracas Peninsula is located 59 kilometers south of the project and as described in Section 2.6.1 of Chapter III. All of the local coastline features of the project area are a product of the regional physiographic context between the Peninsula and the Callao Bay (see Attachment 46, photograph). The breakwater, which will serve to reduce the impacts of the waves on the LNG loading operations will create some localized change in the pattern of wave action (since waves will be subject to diffraction at breakwater

structure) and sediment transport. The effect of the breakwater is considered very small in the overall context of the marine area of influence of the project and there is a very remote possibility that the breakwater will affect the Paracas Peninsula due to such factors as: distance of the peninsula to the project site, predominant current direction, localized circulation systems (such as circulation inside Paracas Bay and around the Pisco River located at 50 kilometers south from the project) and the nature of potential impacts derived from the project marine infrastructure.

The physical and biological characteristics of the impacts of the construction of the breakwater and navigational channel to the direct area of influence are fully described at Section 3.2 of Chapter III. Impacts related to the construction of the breakwater such as increase in turbidity, disturbance to benthic and plankton communities and fisheries are identified, assessed and analyzed in Chapter IV (Sections 2, 3 and 4 respectively). The incremental impacts on seawater turbidity are considered to be temporary in nature and moderate to slightly negative. The impact has variability associated with the characteristics of the area, such as seasonal oceanographic changes (changes on direction and speed of currents) and species and habitat toleration to increments in turbidity and light reduction. In addition, the ability of species to relocate to less disturbed areas (see Section 4.1.4 "construction stage" of Chapter IV) results in the temporary nature of this impact. The effects on the marine flora and fauna (benthic and plankton communities) are considered highly negative mainly associated with removal of substratum, loss of surface area in the direct area of influence to be constructed. An increase of turbidity in the area of construction, and migration of fishing species to external areas with fewer disturbances is a temporary impact. This negative effect during construction will be replaced during the operation stage by the establishment of new benthic and plankton communities that will adapt to new habitat conditions created at breakwater. This new effect is considered a highly positive impact because the re-colonization species are mainly species of great fishing value (see Section 4.2.1 "construction stage" of Chapter IV).

47. The following must be submitted with regard to technical aspects.

47.1 Indicate whether the ships will have double hull and international certification.

Response 47.1

The LNG carriers will be new, have double hull design and carry an international certification.

47.2 Indicate what the company policy will be for ballast treatment, taking into account the guidelines for the control and management of ships' ballast water to minimize the transfer of harmful aquatic organisms and pathogens (Resolution A.868(20)) established by the International Maritime Organization (IMO).

Response 47.2

The LNG carriers will comply with both the Resolution A.868(20) of the International Maritime Organization (IMO) dated November 27, 1997 and the California Ballast Water Management Program. The California rules include the change of ballast water at least 200 nautical miles out from the Peruvian coast with a minimum depth of 2000 meters which is considered the most strict requirement on an international basis. For example, this is more conservative than Director's Resolution 0178-96/DGC requiring that ballast

water be renewed at least once 12 miles away from the Peruvian coast. Also see responses to 142.

- 47.3 Indicate the frequency of methane tankers during the month and the measures to mitigate visual impact.

Response 47.3

An average of six vessels will be loaded each month. It is planned that each vessel will approach the terminal and steam to beyond the 12 mile limit in a direct routing within 15 degrees of being perpendicular to the shore. Persons on the coast at Tambo de Mora and the nearest farm dwelling in Canete are at a distance of 25 and 14 kilometers from the terminal and should have minimum visual impact as visibility data indicates that vision in coastal conditions only exceed 13 kilometers 0.228% of the time. A ship at the berth will not be visible to persons traveling in cars or buses along the Pan American highway due to distance the road is set back from coast and the elevation of the road.

- 47.4 Clearly indicate conditions and/or service requirements (water, food, etc.) from the ship during the product loading procedure.

Response 47.4

The ship will maintain its life support systems completely separate from the terminal. No water, food, fuel, etc will be provided to the ship and no wastes will be removed from the ship.

48. The company must clearly indicate whether they will have an international environmental insurance to cover all environmental and social impacts (taking tugboats into account) that could be generated by an oil spill or accident that could occur in the project's area of influence during the project's construction and operations stage.

Response 48

Peru LNG S.R.L. will establish a sinking fund to provide for the closure of operations. Funding will start five years before the later of the termination of LNG sales or the end of the reserve life. In the case of an Act of God, Peru LNG will carry adequate property coverage to pay for reconstructing the plant and associated facilities. Peru LNG will also carry Sudden and Accidental Pollution coverage as part of its general liability policy to provide for spills and accidents.

49. Indicate the possible effects of sodium hypochlorite injection into the marine ecosystem, taking into account the concentration thereof. Support your answer with research conducted in other countries.

Response 49

The amount of hypochlorite injected into the seawater is too small to disturb the marine ecosystem. The sodium hypochlorite is generated in the Seawater Hypochlorite Generator and injected between the screens of each intake box for the Seawater Pumps. This hypochlorite injection is to control marine growth. This chlorine injection

will be of 0.21 kg/h into the 80 m³/h seawater flowing into the Reverse Osmosis (R.O.) Package, representing a hypochlorite concentration of 2.6 parts per million (ppm). Fifty m³/h of brine from the R.O. will return to the ocean. The maximum remaining hypochlorite concentration of the returning seawater flow per International or Peruvian Standards is 0.2 ppm. This concentration represents 0.01 kg/h of free hypochlorite returning to the ocean, which will be easily diluted. As shown by attachment 50 the dilution of the discharge brine reaches background concentrations about 100 meters from the discharge point, thus the 0.2 ppm residual will be virtually undetectable.

As comparison, other LNG plants of similar size as PLNG using seawater as cooling media will typically use 40,000 m³/h of seawater. With the same parameters of concentration above explained, the sodium hypochlorite injected into the cooling seawater will be 104 kg/h and 8 kg/h of free hypochlorite will return into the ocean.

50. Indicate what effect will be caused by the discharge of brine into the sea (65m³/h) and the mitigation measures to be adopted; consider the cumulative effect due to the location of an emitting point.

Response 50

The reverse osmosis unit will produce concentrated seawater. The average inlet concentration of the seawater will be 36,000 TDS (total dissolved solids) and average outlet concentration will be 56,000 TDS. As shown by the Cormix model (Attachment 50; Modeling of Desalinization Brine Plume at Playa Melchorita, Peru.), the concentrated seawater in the reverse osmosis unit effluent will be diluted to 0.10 ppt (part per thousand) or 36100 PPM TDS within 100 Meters from the point of discharge point, resulting in no effect, immediate or cumulative, outside of the project boundary. A description of the effluent treating and monitoring is provided in Vol. 1, Chapter V, Module SO-2 of the EIA. See also Responses 125, 143, 179.

51. Specify vulnerable marine species and species nearing extinction found in the area where the dock and breakwater will be installed.

Response 51

Some species of migratory birds, marine mammals and reptiles considered as threatened or endangered, according to Vol. I, Chapter IV, Table 15, are occasionally reported or seen by fisherman in the project area. However, no feeding or reproductive grounds of these species were identified during baseline studies of the areas to be impacted by any of the marine portions of the project. Also see response 29.3.

52. Indicate the collateral effect that will result from dredging, driving of piles, deposition for the construction of the breakwater in the marine ecosystem.

Response 52

Collateral effects on the physical and biological components of the marine ecosystem derived from dredging activities, driving piles for construction of trestle structure and construction and operation of breakwater are described in Vol. 1, Chapter IV, Section

4. In summary, dredging of the Navigational Channel during construction will create temporary impacts on the marine ecosystem such as increased turbidity, loss of habitat and benthic species (by removal of substratum at direct area where channel is to be constructed and at final disposal area) and migration of mobile species (such as fish and plankton) to areas of fewer disturbances. Once the navigational channel construction is completed and dredging activities have ceased, the disturbed area will immediately commence to be re-colonized by benthic and plankton species from the surrounding areas. In addition, the re-colonization of these base trophic level (food chain) species, aided by the more stable conditions created by the protection of the breakwater to the west, will result in the return of mobile species.

Driving piles for construction of the trestle will generate intermittent noise and a slight increase in turbidity during construction. Slightly localized changes in the pattern of wave action and sediment transport will also occur once the piles are in place and acting as a part of the trestle structure. However, some benthic communities will utilize these pilings as habitat and commence colonizing the piles soon after they are in place.

Construction of the breakwater will generate temporary effects, such as increased turbidity, loss of benthic species habitat (by removal of some substratum and the covering of the substrate with rocks) and migration of mobile species to less disturbed areas. Once the breakwater is constructed, it will serve to reduce the impacts of the waves on the LNG loading operations, creating some localized changes in sediment transport and the pattern of wave action due to wave diffraction. The localized changes in wave action and sediment transport will generate changes, such as accretion and erosion, in the morphology of the shoreline on the project property and increase the potential for such effects on shoreline areas immediately to the north and south of the project property boundaries. However, the rock used to construct the breakwater will generate new habitats to be colonized by species (particularly benthos) that adapt to rocky environments, which will slowly create a new ecosystem with species of different trophic levels (food chain).

Details of the change in currents due to the breakwater is addressed in Response 141. The current regime in the vicinity of the breakwater has been examined in detail using the field measurements taken at the breakwater location. Generally, the currents remains are relative low velocity and are below 20 cm/sec for about 96% of the time. The most frequent currents flowing towards the southeastern direction that is parallel to the orientation of the breakwater. In this most representative case, the currents remain undisturbed by the breakwater outside a zone that extends about two (2) breakwater widths around the perimeter of the breakwater. This means the currents will be modified within 100 meters of each end and 200 meters of each side of the breakwater. As the currents and the breakwater are both parallel to the shoreline (northwest to southeast orientation) this is predominant case and effect. For test cases where the currents are perpendicular to the breakwater (and shoreline) or at 45 degrees to breakwater, the zone affected is larger. For the currents perpendicular to the shore, the undisturbed zone is estimated to be 800 meters from the breakwater. For currents at 45 degrees to the breakwater, the undisturbed zone is estimated to be 200 meters from each end and 400 meters from each side. A detailed summary of the current velocities and direction is included in the metocean measurement report provided in Response 141a. Results of a current modeling study to show the change in currents caused by the breakwater is included in Response 141b.

53. The manufacturers of machinery and equipment recommend technical specifications for the maintenance and normal operation thereof. The company

must undertake to strictly comply with the recommendations given for each piece of machinery and equipment that will perform work in the project area. Also, submit technical specifications for their respective verification in the field by OSINERG and the DGAA of the MEM.

Response 53

As stated in the reply to Response 30.1, it is standard operating practice and also Peru LNG's intention to operate and maintain machinery in accordance with the Original Equipment Manufacturers recommendations. These recommendations and Peru LNG's planned maintenance program can be reviewed by OSINERG and DGAA upon approval of the project, completion of final engineering design and equipment selection prior to plant start-up.

54. Submit a continuous monitoring and evaluation program of the biological aspects of the marine ecosystem.

Response 54

A continuous marine biological monitoring and evaluation program during the construction and operation stages is described in Vol.1, Chapter V, as follows:

During construction, three transect lines (see module SM-6) represent the direct area of influence of the project. Water column monitoring will be conducted at five stations on each transect line during autumn and spring of each year (see Figure SM-6.1 for locations). The objective of the monitoring program is to monitor subtidal and intertidal marine communities, augment baseline data and evaluate and identify sources of variations attributable to project activities. The same parameters as those evaluated during the EIA baseline will be monitored and will include the following:

- **Hydrographic and marine circulation parameters:** Temperature, Salinity and Current velocity;
- **Physical and chemical quality parameters:** Dissolved Oxygen, pH, TSS, Total Nitrogen, Organic Nitrogen, Total Phosphorus, Sulphates, Chlorophyll and granulometric analysis of sediments;
- **Microbiological and organic parameters:** BOD5, Total Coliforms and Fecal Coliforms;
- **Biological parameters:** Benthic, Plankton and Fish.

Data from this monitoring program will be integrated with data collected during monitoring of physical and chemical parameters of marine sediments as presented in module SM-5. Marine sediments will be collected at these same transect lines, but only at 3 stations on each transect (see Figure SM-5.1 for locations). Annual monitoring will also be conducted during autumn and spring and the samples analyzed for the following parameters: Arsenic, Cadmium, Copper, Chromium, Mercury, Lead, Zinc, Nickel and TPH. This data will also be compared with baseline sediment data to evaluate and identify sources of variations attributable to project activities.

In addition, the data will be integrated with marine water quality data as described in module SM-2. As per the monitoring of sediments and marine biological schemes

described above, physical-chemical and bacteriological parameters as listed on Table SM-2.5 will be monitored in the water column every 3 months at same transect lines and stations as per monitoring of sediments and marine biological schemes described above. Additionally, daily monitoring of turbidity levels at water column on 2 transect lines located at 600 m north and south (3 stations per transect) of the work area will be conducted during dredging activities. Location of monitoring stations for marine water quality is provided at figure SM-2.1. The purpose of this monitoring program is to collect data that can be compared to the water quality data gathered during baseline studies to evaluate and identify sources of variations attributable to project activities.

At the completion of the construction stage, and the commencement of operational activities, the monitoring program as previously described will continue according to provisions provided at module SO-4 "Monitoring of Marine Ecosystem" in conjunction with modules SO-3 "Monitoring of Marine Sediments" and SO-2 "Monitoring of Water Quality". Water quality parameters such as physical – chemical and bacteriological parameters will be monitored every 3 months while sediment and marine ecosystem parameters will be monitored during autumn and spring. Similar to the monitoring during the construction stage, the objective of the monitoring program during the operational stage is to observe the subtidal and intertidal marine communities and continue augmenting baseline data in order to evaluate and identify sources of variations attributable to project activities.

55. The Environmental Management Plan must include a simulation through a Mathematical Modeling that will allow interrelating the different biotic and abiotic characteristics of the marine ecosystem, and the mitigation measures set forth in the EIA must minimize the impact upon the marine ecosystem.

Response 55

As described in Response No. 54, the Environmental Management Plan included in Chapter V is designed to integrate data gathered during EIA baseline studies with data gathered during project construction and operation stages. This data integration will help to identify changes, trends and the sources of changes and will also help to define variables for an impact model to be developed in the near future. The baseline studies provided insufficient data for integration and the subsequent establishment of variables and mathematical assumptions for developing such a model. The objective of the monitoring program is to supplement the baseline data collected during the EIA in order to provide additional information that can be used to evaluate the variables and environmental factors that were used in evaluating the impacts and developing mitigation measures.

The Environmental Monitoring Plan is a living document that will be supplemented and modified as needed to continuously evaluate marine environmental conditions and measures implemented to avoid, minimize or mitigate the impacts.

56. Indicate the impact radius of the plume of sediments in suspension in the marine water column; establish the maximum limits of particles in suspension, taking into account the support capacity of the marine species.

Response 56

As presented in Section 2.6.3 of Chapter III, the sediments of the study area have been characterized to contain 15% to 30% of fine materials. This fine material has the ability to be eroded from the sea bottom if water velocity reaches more than 20 cm/s. Velocity measurements conducted during the EIA baseline study indicate that water currents with such velocities occur naturally in the project area. Information provided in Section 3.2.2.2 of Chapter III, indicates that during the spring sampling event, bottom currents reached 21.5 cm/s from the southeast. During the autumn sampling event, bottom current velocities ranged from 4.19 cm/s to 15.69 cm/s from the northwest direction. Surface water currents were observed with a velocity of 22.3 cm/s during the spring and 20.42 cm/s during autumn. Considering the sediment characteristics, sea bottom and surface water current velocities and directions and the proposed dredging method to be implemented during construction of the navigation channel, a dispersed plume of sediment is anticipated to travel approximately 500m from disturbed areas in a northwesterly direction for most of the project period. Although a change in current direction to the Southeast is expected during short periods of the year, similar dispersion distances are anticipated. The distribution of sediment particles in the water column are expected to remain predominantly between mid to bottom water levels and are not likely to reach the water surface due to the characteristics of sediment particles encountered in the study area.

As described in Section 3.2.2 of Chapter III, the species and habitat encountered and evaluated during baseline surveys were found to be tolerant of high turbidity levels. Although, there are no referential values defined in Peru for marine species turbidity tolerance, the World Bank indicates that turbidity should be monitored and maintained below 200 mg/L, particularly during critical spawning and other set periods for shellfish (See Environmental, Health and Safety Guidelines for Port and Harbor Facilities by IFC, 1998). Turbidity levels similar to those suggested by the World Bank have been observed at the Port of Callao, where fishing activities are regularly conducted without any relationship observed between high turbidity level and the harvest of fishing species.

However, as indicated in module SM-2 of Chapter V, daily turbidity monitoring will be conducted in the water column on 3 different stations located at 600 m distance from the work area on the north and south boundaries (location of stations on Figure SM-2.1) to help reduce the extent of the sediment plume from the work area. This monitoring program is designed to provide an early warning of increasing turbidity levels above background conditions. If turbidity values are recorded at the monitoring stations above 200 mg/L limit, measures will be taken to impede migration of the sediment plume and to reduce turbidity levels, (e.g., reduction on dredging speed or work stoppage) and avoid migration of the turbidity plume outside the immediate impact area of the project.

A- DOCK

57. Submit the general design of the dock, which must include pile specifications.

Response 57

A different design philosophy is used for the trestle and for the dock/platform area. The dock/platform facility is discussed in Response 70 below. This section will address the trestle system.

The trestle design is for a structure needed to support the piping and cables between the loading dock and the shore and includes a roadway with guardrails for vehicle access. The roadway is suitable for a 25 Tonne mobile crane or other vehicles needed to service the tugs and maintain the marine structures. The trestle will be constructed using 900 mm diameter steel piles driven into the seabed. Pile material will be API 5L and will be designed in accordance with API RP 2A. Piles in the surf zone will have an additional steel thickness of 6 mm for abrasion allowance from one meter below the mud line to the topside of the structure. A total steel thickness of 25 mm is expected. Specially designed coatings will be used in the splash zone. High build epoxy coating will be used above and below the splash zone and sacrificial anodes will be installed on all submerged structures to control corrosion. The structure will be designed for a working life of at least 30 years. Pile driving will be performed by a crane of approximately 200 tons of capacity, starting work from the beach bulkhead and installing the pile caps and temporary work decking before moving ahead. The decking can be fabricated in large panels from steel or precast concrete and set in place in one piece. The piles will be driven into the seabed to the required depth needed to withstand the various combinations of compression, tension and torsional loadings relating to construction, dead loads, live loads and extreme environmental loads including earthquakes.

58. Submit the methodology and tests for pile driving.

Response 58

Pile driving will be performed as indicated in Response 57 and acceptance testing will be performed using a Pile Driving Analyzer (PDA) during construction to confirm that performance requirements of the pile is met.

59. Indicate the collateral effects that will be caused to the marine ecosystem by dredging, driving of piles during construction of the dock.

Response 59

Collateral effects on the physical and biological components of the marine ecosystem derived from dredging activities, driving piles for construction of trestle structure and construction and operation of breakwater are described in Section 4, Chapter IV. In summary, dredging of the Navigational Channel during construction will create temporary impacts on the marine ecosystem such as increased turbidity, loss of habitat and benthic species (by removal of the substratum in the direct area where the channel is to be constructed and at the final disposal area) and migration of mobile species (such as fish and plankton) to areas of fewer disturbances. Once the navigational channel construction is completed and dredging activities have ceased, the disturbed area will immediately commence to be re-colonized by benthic and plankton species from the surrounding areas. In addition, the re-colonization of these base trophic level (food chain) species, aided by the more stable conditions created by the protection of the breakwater to the west, will result in the return of mobile species.

Driving piles for construction of the trestle will generate intermittent noise and a slight increase in turbidity during construction. Slightly localized changes in the pattern of wave action and sediment transport will also occur once the piles are in place and acting as a part of the trestle structure. However, some benthic communities will utilize these pilings as habitat and commence colonizing the piles soon after they are in place.

Construction of the breakwater will generate temporary effects, such as increased turbidity, loss of benthic species habitat (by removal of some substratum and the covering of the substrate with rocks) and migration of mobile species to less disturbed areas. Once the breakwater is constructed, it will serve to reduce the impacts of the waves on the LNG loading operations, creating some localized changes in sediment transport and the pattern of wave action due to wave diffraction. The localized changes in wave action and sediment transport will generate changes, such as accretion and erosion, in the morphology of the shoreline on the project property and increase the potential for such effects on shoreline areas immediately to the north and south of the project property boundaries. However, the rock used to construct the breakwater will generate a new habitat to be colonized by species (particularly benthic) that adapt to rocky environments, which will slowly create a new ecosystem with species of different trophic levels (food chain).

60. Indicate how subsea pipes will be transported to the work site and where they will be stored before being laid.

Response 60

No subsea pipes are to be used in the Peru LNG Export Project.

61. Indicate what measures have been considered to ensure the maximum resistance of pipes in the event of major seismic event.

Response 61

Seismic design standards used for the marine structures are API RP2A - LRFD (Load and Resistance Factor Design) code plus the NFPA 59A criteria used for the total plant. Because of the very complex seismic environment and the importance of the LNG facility, detailed analyses were performed using state of the art seismic hazard analysis techniques that accounted for different interpretations of earthquake generating mechanisms, an analysis of over 15,000 historic earthquake records and the use of latest ground motion attenuation relationships. Active and potentially active seismic sources since the 1500's in the region were identified to determine a conservative estimate of ground motions at the site from the largest earthquake magnitude from each source. This deterministic analysis resulted in a conservative estimate of ground motions from the largest possible subduction earthquake in nearby sources conservatively located at a distance closest to the site (37 kilometers).

Design spectra were developed for both the OBE and the SSE conditions. The OBE (Operating Basis Earthquake) has a 10% probability of being exceeded in 50 years – this is a 475 years return period. This means that the structure may be subject to an OBE during its design life. This probability level is commonly used in most U.S. codes for the design of engineered structures. For the Peru LNG marine structures, this OBE is considered to be equivalent to the SLE (Strength Level Earthquake) as it pertains to API RP2A for a structure that will not fail – stresses may approach yield with minimal deformation. This means no disruption of service.

The SSE (Safe Shutdown Earthquake) has a 1% probability of being exceeded in 50 years. This is a 4,975-year return period. The SSE motions represent ground motions that are very rare or have a very low likelihood of occurring. For the Peru LNG marine structures, this SSE is considered to be equivalent to the DLE (Ductility Level

Earthquake) as it pertains to API RP2A for a structure that will not collapse. This means that there will be no loss of LNG.

The marine structures will be designed with adequate element sizes for strength and stiffness to ensure no significant structural damage during the life of the structure and the facility will continue to contain LNG.

62. Submit the noise monitoring program, especially for the Wakama resort.

Response 62

Reference Attachment 29.4 for a translation of the noise modeling report by KBR that includes the Wakama resort. During the construction and start-up of operations, a noise survey will be conducted at the receptors identified in the EIA including Wakama. The procedures used will be identical to those described in Section 4.2.1 of Chapter III. The nearest receptors are the Wakama resort and the illegal settlement of Nuevo Ayacucho, located approximately 6 km and 4 km south of the project area, respectively. Table 4-5 presents the coordinates of the sites selected for the noise monitoring and Map EQ-01 presents the geographic locations. A Class 1 sound meter will be used under the low response mode to obtain the integral of the noise pressure levels of A-weighting and frequency data of 1/3 octave. The device will be programmed to measure levels equivalent (L_{eq}) to intervals of 15 minutes during a complete 24-hour period measuring per site, providing a total of 97 records by site.

The sound meter will consist of the following components:

1. Equipment for Continuous Noise Measurement
 - a. Delta Ohm, model HD 9019 Integrating Type I Sound Level Meter
 - b. HD 9019S/1, Class 1 Microphone Preamplifier
 - c. MK221 Model Condenser Microphone
 - d. Windscreen, tripod and various cables
2. Sound Level Calibration Unit
 - a. Delta Ohm HD 9101 Model Noise Level Calibrator, 94/114 dB at a frequency at 1,000 Hz.

The Delta Ohm HD 9019 sound level meter complies with the IEC 651 (CEI EN 60651/1994) and IEC 804 (CEI EN 60804/1994) standards for Type I precision instruments. The band filters of 1/3 octave are under the IEC 1260 (CEI EN 6126/1995) standards for Class 2. The calibration certificates for both equipment components are presented in Appendix 2. The sound level meter used to monitor the noise levels will be operated in a slow response mode to obtain accurate, integrated, A-weighted sound pressure levels. All measurements will be taken outdoors and a windscreen used to alleviate any possible measurement errors due to wind effects across the microphone face. The microphone will be mounted on a tripod at a height of 1.5 meters above grade and positioned at a 45-degree angle, as specified by ANSI standards, and powered by a 9-volt external power source. The sound level meter and octave band analyzer will be calibrated immediately prior to and immediately after the sampling period to provide a quality control check of the sound level meter operation during monitoring. Integrated sound pressure level (SPL) data consisting of the following parameters will be collected at each location. L_{eq} is the SPL averaged over the measurement period. This parameter is the continuous steady sound pressure level

that would have the same acoustic energy as the real fluctuating noise over the same time period.

Max	The maximum SPL for the sampling period; and
Min	The minimum SPL for the sampling period.
L_{eq}	The SPL averaged over the measurement period; this parameter is the continuous steady sound pressure level that would have the same acoustic energy as the actual fluctuating noise over the same time period.

Local wind speed and temperature will be noted during each noise-monitoring period.

The noise measurements conducted during the operations of the plant will be compared against the noise levels predicted at each receptor and against the World Bank Guidelines presented in Section 4.2.2 and in accordance to module SM-4 and SO-6 of Chapter V.

63. Indicate what chemicals will be used to dry the pipes before operations begin and what environmental management will apply to them.

Response 63

No chemicals will be used to dry the pipes. All pipes subject to the possibility of freezing any residual water or moisture will be dried by circulating dry natural gas at low pressure throughout the different systems until obtaining the desired dryness level.

64. The project contemplates the performance of non-destructive tests that generate hazardous wastes. In this regard, the final disposal thereof must be indicated.

Response 64

A record will be kept for all hazardous waste indicating the quantity, transporter and final destination of all hazardous wastes. Depending upon the type of waste, final disposal could be to an approved landfill, incineration, bio-remediation, recycling, etc. Special wastes such as car batteries, print cartridges, etc., will be returned to the supplier or authorized recycler. Also see response 30.6.

65. With regard to hydrostatic tests, it is necessary to indicate the type of fluid, testing procedure and fluid discharge.

Response 65

Water will be used for hydrostatic testing and nitrogen for pneumatic pressure testing of equipment and piping. Testing procedures from NFPA 59A and ASME B31.3 will be followed to meet the required regulations and codes for the project. Hydrostatic testing of tanks will be in accordance with API 620, meeting the water quality requirements as specified in Q.8.3. Due to the large volume required, a second option for the LNG Storage Tanks is to hydrostatic test with seawater. If the EPC contractor requests this option, PLNG will make sure that only biodegradable products are used. If used, PLNG will make sure returning seawater to the Pacific Ocean meets Peruvian Environmental Regulations. Pumping hydrostatic testing water out of the LNG tanks will require the installation of temporary piping.

After hydrostatic testing, the test media will be completely drained or removed from the system. Freshwater from each hydrostatic test will be used for plant site irrigation or will be pumped into plant wash water management system and then to the Pacific Ocean. After pneumatic testing, nitrogen will be released in a controlled manner to the atmosphere as per ASME B31.3. Both hydrostatic and pneumatic testing operations will be done complying with Peruvian regulations.

Refer also to Response 67.

66. Indicate the places with the greatest risk of spills caused by pipe leaks and/or breakage; and what operational and maintenance measures will be implemented.

Response 66

As shown in Chapter V, Section 4.2.2.6 - General Approach to the Contingency Plan, PLNG will prepare a Contingency Plan for the Operation of the LNG Export Project, which will be based on the risk analysis related to the operation of the plant and marine Facilities. The Contingency Plan for spills and emergency response during plant operations shall be submitted to the General Bureau of Hydrocarbons (DGH) and OSINERG for its approval as stated in the Environmental Protection Regulations for Hydrocarbon Activities (Supreme Decree 046-93 EM, Article 23). Also, the contingency plan for spills and emergency during marine facilities operations shall be submitted to the Harbormaster's Office of the corresponding jurisdiction, for its review and approval as stated in the Administrative Procedures Unified Text ("Texto Unico de Procedimientos Administrativos") of the Peruvian Navy, and following the guidelines approved in the Directorate Resolution N° 0497-98/DCG. The contingency plan of the installations shall adhere to the National Contingency Plan and to the Local Contingency Plan of the corresponding Harbormaster's Office. The preparation of the Contingency Plan will have to take into account the following written procedures regarding the "ship – dock" interface, specially recommended by the International Maritime Organization – IMO (communications between the parties and responsibilities). As supplement of these documents, the checklists (Ship/Shore Safety Check List), Parts "A" and "C", promoted by IMO and written by the "Society of International Gas Tanker and Terminal Operators Ltd" (SIGTTO) will be adapted.

Failure Case Scenario

The potential release sources of propane and LNG are determined from a combination of past history of releases from similar facilities and an analysis of potential sources based on facility-specific information and processes. The location of the four vapor dispersion release and three explosion overpressure release scenarios and the description of the release and conditions at each location are described below:

- Scenario 1: Discharge of the LNG storage tank
- Scenario 2: Discharge piping of the liquefaction portion of the process unit (hole in top of piping)
- Scenario 3: Discharge piping of the liquefaction portion of the process unit (hole in bottom of piping)
- Scenario 4: Loading arm on the trestle.
- Scenario 5: Discharge piping of the propane compressor.
- Scenario 6: Discharge piping of the propane condenser.
- Scenario 7: Discharge piping of the propane accumulator

Scenario 1: A liquid release was assumed to occur from one of the LNG containment tanks due to a failure of the discharge piping from the tank. The release was assumed to have occurred for a period of ten minutes using the estimated pump out rate of 5,500 m³/hour. This release was assumed to be oriented horizontally and spilled into the sump. The LNG tanks are single containment with in-tank pumps discharging through the top of the tanks.

Scenario 2: A liquid release was assumed to occur from the discharge piping of the liquefaction portion of the process unit. The release was assumed to have occurred for ten minutes and was a result of a 2-inch hole in the top of the piping. The release was assumed to be oriented vertically and spilled into the process area sump.

Scenario 3: A liquid release was assumed to occur from the discharge piping of the liquefaction portion of the process unit. This release was assumed to have occurred for ten minutes and was a result of a 2-inch hole in the bottom of the piping. The release was assumed to be oriented vertically and spilled into the process area sump.

Scenario 4: A liquid release was assumed to occur from a loading arm on the trestle. The release occurred for 70 seconds, based on the closing speed of the ESD valve, using the estimated pump out rate of 3,667 m³/hour. The vapor cloud was assumed to originate from a cylindrical sump with a capacity of 70 m³.

Scenario 5: A two-inch hole, oriented vertically downward, was assumed to occur in the discharge piping of the propane compressor. The resulting leak was in a vapor phase and existed for a duration of 10 minutes. A 6,200-m³ vapor cloud was formed and drifted 85 meters down wind before ignition. Considering the tightly packed process area with the overhead pipe racks, a degree of confinement of 2.5-D and a High Obstacle Density was deemed appropriate for this explosion scenario. The degree of confinement was calculated by averaging the results of 2-D and 3-D confinement calculations.

Scenario 6: A two-inch hole, oriented vertically downward, was assumed to occur in the discharge piping of the propane condenser. The resulting leak was in a liquid phase and existed for a duration of 10 minutes. A 23,000-m³ vapor cloud was formed and drifted 55 meters down wind before ignition. Considering the tightly packed process area with the overhead pipe racks, a degree of confinement of 2.5-D and a High Obstacle Density was deemed appropriate for this explosion scenario. The degree of confinement was calculated by averaging the results of 2-D and 3-D confinement calculations.

Scenario 7: A two-inch hole, oriented vertically downward, was assumed to occur in the discharge piping of the propane accumulator. The resulting leak was a liquid phase and existed for a duration of 10 minutes. A 23,000-m³ vapor cloud was formed and drifted 55 meters down wind before ignition. Considering the tightly packed process area with the overhead pipe racks, a degree of confinement of 2.5-D and a High Obstacle Density was deemed appropriate for this explosion scenario. The degree of confinement was calculated by averaging the results of 2-D and 3-D confinement calculations.

A Hazard Zone Analysis was performed and included in this section of the EIA. The release conditions (e.g. pressure, temperature, hole size, etc.) as presented in Table 5 are used in conjunction with the release scenario to produce a set of hazard zones for

each potential failure case. Table 6 presents a summary of the release scenario hazard distances under the weather conditions for releases described in Table 5. The table provides the downwind ground level distances to the specified hazard endpoints for a low wind (2 m/sec) and a stable atmospheric case (F stability). Figures 2 through 6 provide a graphical presentation of the hazard endpoints for the various scenarios. All endpoints for each of the release scenarios lie within the property boundaries of the project.

67. Indicate the chemicals that will be used to eliminate oxidant, corrosive and scale-formation agents during hydrostatic testing; what environmental management and monitoring program will apply to them.

Response 67

First option to conduct the hydrostatic test of pipes and equipment including the LNG tanks is to use potable water from seawater processed in reverse osmosis units and if required, complemented by water from the Cañete River. In this option, no environmental management and monitoring will be required. A second option, much less preferred, is to use seawater for the LNG tank hydro test. In this case, walls of the internal containment with 9% nickel will be protected with suitable paint or other means against potential corrosion attack by the seawater. If tank contractor during the EPC phase recommends the addition of chemicals to eliminate oxidant, corrosive or scale-formation agents during the hydro test, owner will require them to be biodegradable. Refer also to Response 65.

68. The company must define whether it will use the Cañete River waters to conduct Hydrostatic tests; if so, submit a Specific Environmental Management plan for this activity.

Response 68

The use of water from the Cañete River to perform hydrostatic tests will be defined during the EPC phase of the project. If required, it will be used as a supplement to the water produced from reverse osmosis to perform the hydrostatic test of the LNG Storage Tanks. These tanks require a large quantity of water of approximately 70,000 m³ per tank. Hydrostatic test water must comply with the requirements of Code API 620 Appendix Q.8.3 requiring the water to be clean and clear, with no objectionable odor (that is, no hydrogen sulfide) and a pH between 6 and 8.3 and temperature below 49 °C (120 °F). After testing is completed, the water will be pumped into the plant wastewater management system where monitoring will be conducted as indicated in Response 39.3.

69. In the EIA it has been described that three tugboats will be used for berthing operations. It is required to indicate the volume of fuel (Diesel) that will be used as well as preventive and mitigation measures to address a possible spill in the recipient body.

Response 69

It is estimated that three tugboats will consume an average of around 5 m³ per day of diesel fuel in total for three tugs. Each tug will have a storage capacity of around 140 m³. each showing that refueling will only be needed every month or so. The very low

rate of fuel consumption is due to the very low utilization rate – most of the time is on a standby mode waiting for LNG carrier loading every five or six days. Fuel will be loaded onto the tugs from the utility dock on the trestle. Diesel is delivered to the utility dock by a permanent steel pipeline and connected to the tug by a hose and reel system. Spill response equipment and procedures will be in place at the facility and onboard support vessels. Watches will be in place during fueling operations. Spill response drills will be conducted at least twice per year including testing of all warning signals and emergency shut offs. Equipment, the oil spill response plan and other details are fully described in Response 180.

B- PLATFORM

70. Submit the general design of the platform which must include pile specifications.

Response 70

The platform and dolphin structures will be prefabricated jacket structures installed by a derrick barge of 400 tons or greater capacity. The platform area is made up of two jacket sections to reduce the unit weights to less than 300 tons. Each dolphin trestle jacket will be approximately 150 tons. After the jackets are set, 1000 mm diameter steel piles up to 50 mm thickness will be driven through the jacket legs of the loading platform into the seabed to the required depth to provide the required compression and tensions loads for the various combinations of loads relating to construction, dead loads, operating live loads and extreme environmental loads including earthquakes. Pile material will be API 5L and will be designed in accordance with API RP 2A. The space between the pile and the jacket structure will be filled with concrete to preclude corrosion and for added strength. The structure will be designed to have a design life of at least 30 years.

71. Submit the methodology and tests for pile driving.

Response 71

As indicated in Response 58, pile driving will be performed as indicated in Response 57 and acceptance testing will be performed using a Pile Driving Analyzer (PDA) during construction to confirm that performance requirements of the pile is met.

72. Submit a Specific Contingency Plan for loading operations onto methane tankers.

Response 72

Please see Responses 102, 180 and Attachment 180.

C- ACCESS CANAL

73. Submit the dredging method selected taking into account the minimization of the impact to the coastal ecosystem.

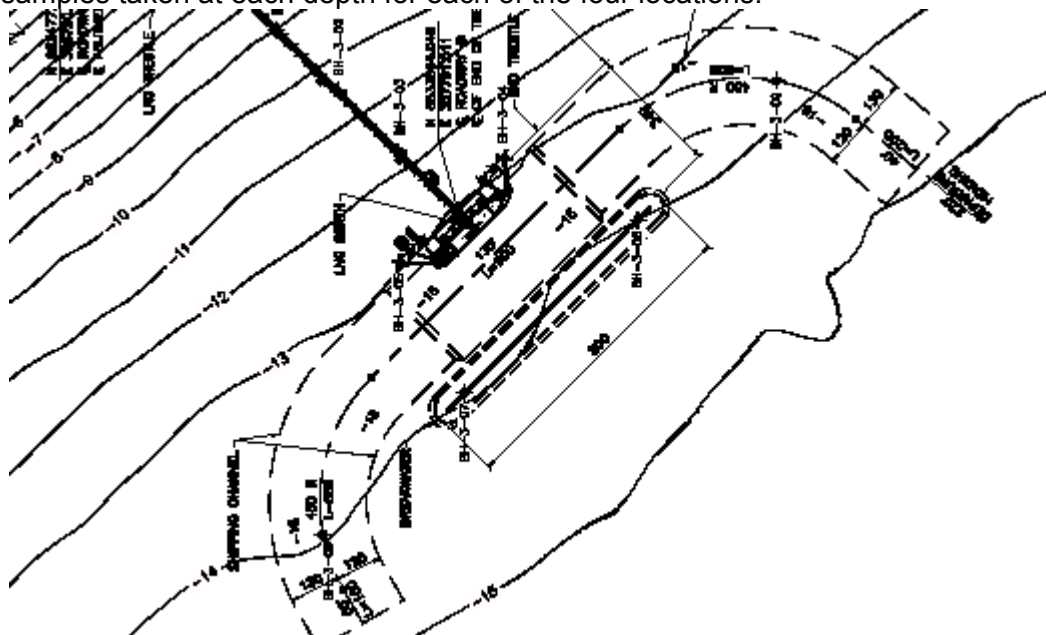
Response 73

As indicated in Section 3.1.4 and Section 2.6.3 of Chapter III of the EIA, a suction dredge technique will be used for dredging the navigational channel suitable for the soils encountered in the proposed channel. This technique was selected to minimize the impacts associated with conventional mechanical bucket dredging techniques that tend to generate higher levels of turbidity. Please see Responses 52, 54, 55, 56 and 59 for more details concerning mitigation techniques being employed by PLNG to minimize impacts on the coastal ecosystem.

74. Submit the physical-chemical characterization of the sea bottom up to three meters corresponding to the dredging depth, in order to determine possible contaminated areas that may be removed during the dredging of the canal.

Response 74

Peru LNG has conducted detailed geotechnical investigations and testing of samples in the area to be dredged. Data was taken along the 14 meters depth contour from the center of the north side channel (BH-3-06) to the center of the south side channel (BH-3-09) with two additional sample points evenly spaced in between (BH-3-07 and 08). Chemical tests were performed on five samples between the surface and 5 meters depth at each test point. The locations are shown on the plan drawing below. The table following shows the results of analysis completed at the various seabottom samples taken at each depth for each of the four locations.



Resultados de análisis y análisis estadístico global

Concentración (mg/kg)

Sondaje	Profundidad (m)	Hg	Cd	Pb	Cu	Fe
BH-3-06	0.00-0.30	0.099	3.91	11.4	16.9	17310
	0.30-0.50	0.044	3.41	10.2	13.8	14320
	1.65-2.10	0.038	3.65	11.2	13.5	19510
	3.10-3.55	0.011	2.13	1.6	18.7	16330
	4.65-4.75	0.014	2.34	2.9	22.4	21200
	4.75-5.10	0.016	2.04		13.4	14220
BH-3-07	0.00-0.30	0.052	3.78	11.5	14.4	18900

	0.30-0.50	0.047	3.28	9.7	12.8	16200
	1.60-2.05	0.045	3.57	11	12.6	18060
	3.10-3.55	0.02	2.71	4	18.1	21340
	4.70-5.15	0.016	2.24		15.7	15320
BH-3-08	0.00-0.30	0.073	3.16	10.5	13.8	14760
	0.40-0.60	0.083	3.29	10.6	11.8	16580
	1.60-2.05	0.076	3.6	11.7	12.8	20420
	3.10-3.55	0.032	2.42	3.3	19.1	19960
	4.60-5.05	0.037	2.01	2.5	15.7	15910
BH-3-09	0.00-0.30	0.063	3.21	10.2	13.9	15770
	0.50-0.70	0.072	3.29	10.3	14.7	17520
	1.60-2.05	0.084	3.5	10.2	18.8	21230
	3.10-3.55	0.05	2.45		18	20060
	4.60-5.05	0.026	2.11		16	19920
	Máximo	0.10	3.91	11.70	22.40	21340.00
	Mínimo	0.01	2.01	1.60	11.80	14220.00
	Promedio	0.05	2.96	8.40	15.57	17849.52
	Desv. Estándar	0.03	0.65	3.75	2.76	2404.98
	Coef. Variación	55.05	21.95	44.65	17.72	13.47

75. Submit the Environmental Study for the dredging of the access canal, which must contain an assessment of the current condition, a description of the procedure, environmental implications, environmental management plan and monitoring program during the operations and closure plan with post-closure monitoring program.

Response 75

Collateral effects on the physical and biological components of the marine ecosystem derived from dredging activities, driving piles for construction of trestle structure and construction and operation of breakwater are described in Section 4, Chapter IV. In summary, dredging of the Navigational Channel during construction will create temporary impacts on the marine ecosystem such as increased turbidity, loss of habitat and benthic species (by removal of substratum at direct area where channel is to be constructed and at final disposal area) and migration of mobile species (such as fish and plankton) to areas of less disturbance. Once the navigational channel construction is completed and dredging activities have ceased, the disturbed area will immediately commence to be re-colonized by benthic and plankton species from the surrounding areas. In addition, the re-colonization of these base trophic level (food chain) species, aided by the more stable conditions created by the protection of the breakwater to the west, will result in the return of mobile species.

A continuous marine biological monitoring and evaluation program during the construction and operation stages is described in Chapter V, as follows:

During construction, three transect lines (see module SM-6) represent the direct area of influence of the project. Water column monitoring will be conducted at 5 stations on each transect line during autumn and spring of each year (see Figure SM-6.1 for locations). The objective of the monitoring program is to observe subtidal and intertidal marine communities, augment baseline data and evaluate and identify sources of variations attributable to project activities. The same parameters as those evaluated during the EIA baseline will be monitored and will include the following:

- **Hydrographic and marine circulation parameters:** Temperature, Salinity and Current velocity;
- **Physical and chemical quality parameters:** Dissolved Oxygen, pH, TSS, Total Nitrogen, Organic Nitrogen, Total Phosphorus, Sulphates, Chlorophyll and granulometric analysis of sediments;
- **Microbiological and organic parameters:** BOD5, Total Coliforms and Fecal Coliforms;
- **Biological parameters:** Benthic, Plankton and Fish.

Data from this monitoring program will be integrated with data collected during monitoring of physical and chemical parameters of marine sediments as presented in module SM-5. Marine sediments will be collected at these same transect lines, but only at three stations on each transect (see Figure SM-5.1 for locations). Annual monitoring will also be conducted during autumn and spring and the samples analyzed for the following parameters: Arsenic, Cadmium, Copper, Chromium, Mercury, Lead, Zinc, Nickel and TPH. This data will also be compared with baseline sediment data to evaluate and identify sources of variations attributable to project activities.

In addition, the data will be integrated with marine water quality data as described in module SM-2. As per the monitoring of sediments and marine biological schemes described above, physical-chemical and bacteriological parameters as listed on Table SM-2.5 will be monitored in the water column every three months at these same transect lines and stations. Additionally, daily monitoring of turbidity levels at water columns on two transect lines located at 600 m north and south (three stations per transect) of the work area will be conducted during dredging activities. Location of monitoring stations for marine water quality is provided at figure SM-2.1. The purpose of this monitoring program is to collect data that can be compared to the water quality data gathered during baseline studies to evaluate and identify sources of variations attributable to project activities.

At the completion of the construction stage and the commencement of operational activities, the monitoring program as previously described will continue according to provisions provided at module SO-4 "Monitoring of Marine Ecosystem" in conjunction with modules SO-3 "Monitoring of Marine Sediments" and SO-2 "Monitoring of Water Quality". Water quality parameters such as physical – chemical and bacteriological parameters will be monitored every three months, while sediment and marine ecosystem parameters will be monitored during autumn and spring. Similar to the monitoring during the construction stage, the objective of the monitoring program during the operational stage is to observe the subtidal and intertidal marine communities and continue augmenting baseline data in order to evaluate and identify sources of variations attributable to project activities.

Please see Responses 52, 54, 55, 56 and 59 for more details concerning pre and post project monitoring plans and mitigation techniques being employed by PLNG to minimize impacts on the coastal ecosystem.

76. Indicate the canal maintenance frequency and procedure and an Emergency Response Plan that will include response to fuel spill, fire and accident threats, which must conform to the National Contingency Plan and Local Contingency Plan of the Harbor Master's Office. Also, the company must undertake to submit to the DGAA of the MEM a periodic environmental assessment for the

canal dredging, which must include the physical-chemical characterization of the seabed for its respective assessment.

Response 76

Future maintenance of the canal is expected due to silting from normal tidal action, with the maintenance equipment and procedures most likely mirroring that of the initial canal construction. However, the frequency and exact maintenance procedure can only be developed following construction of the canal and monitoring of the rate and characterization of silting action. More information can be provided following completion of the canal and subsequent monitoring.

As shown in Chapter V, Section 4.2.2.6 - General Approach to the Contingency Plan, PLNG will prepare a Contingency Plan for the Operation of the LNG Export Project, which will be based on the risk analysis related to the operation of the plant and marine Facilities. The Contingency Plan for spills and emergency response during plant operations shall be submitted to the General Bureau of Hydrocarbons (DGH) and OSINERG for its approval as stated in the Environmental Protection Regulations for Hydrocarbon Activities (Supreme Decree 046-93 EM, Article 23). Also, the contingency plan for spills and emergency during marine facilities operations shall be submitted to the Harbormaster's Office of the corresponding jurisdiction, for its review and approval as stated in the Administrative Procedures Unified Text ("Texto Unico de Procedimientos Administrativos") of the Peruvian Navy, and following the guidelines approved in the Directorate Resolution N° 0497-98/DCG. The contingency plan of the installations shall adhere to the National Contingency Plan and to the Local Contingency Plan of the corresponding Harbormaster's Office. The preparation of the Contingency Plan will have to take into account the following written procedures regarding the "ship – dock" interface, specially recommended by the International Maritime Organization – IMO (communications between the parties and responsibilities). As supplement of these documents, the checklists (Ship/Shore Safety Check List), Parts "A" and "C", promoted by IMO and written by the "Society of International Gas Tanker and Terminal Operators Ltd" (SIGTTO) will be adapted. Please review Response 180 for updated details of the oil spill contingency plan and emergency equipment that will be provided.

Please see Responses 52, 54, 55, 56, 59 and 75 for more details concerning pre and post project monitoring plans and mitigation techniques being employed by PLNG to minimize project impacts on the coastal ecosystem.

77. With regard to the final disposal of dredged material, indicate the discharge point and its environmental assessment, a description of the operations, their environmental implications, environmental management plan, monitoring program during the operations and closure plan with its respective post-closure monitoring program.

Response 77

The disposal site studied for permanent storage of the material removed from the channel dredging operation is at a depth of 25 meters located approximately 6 km seaward from the channel location and 7.5 km from the beach from the facility. The disposal site will be within an area of seabed 2 km by 2 km in size generally ranging between 20 and 30 meters deep. The seabottom materials have been tested for biological, chemical, and physical characterization and the seawater column have been

checked for suspended solids, nutrients, bio, chem. and hydrocarbons (at surface). Details of the location and testing are provided in the Annex 6 of Volume 2. A description of the operations and environmental management plan and monitoring program is also provided in Annex 6. Further details of the operation to show the estimated movement of the spoil movement during the dumping process at the disposal site is shown in Response 104. As indicated in Response 54, the monitoring program will continue until the bio system has been shown to stable as compared to baseline conditions.

D- BREAKWATER

78. Submit the environmental study for the exploitation of the quarry, since the volume to be extracted is quite significant: 1,200,000 m³.

Response 78

The titleholder is obtaining mineral concessions for three different quarry sites of which only one will be selected for use in the project. The selection of the quarry site to be used will not be determined until an EPC Contract Bid Package is sent out and bids are received. Once the bids have been evaluated and it has been determined which quarry site is most effective for the project, a separate EIA will be filed for that quarry site. All of the potential quarries being considered is outside of the Paracas Reserve buffer zone. Any material required to construct the Plant and marine facilities will be obtained from either a licensed and approved quarry or from a new quarry that will be evaluated by conducting an EIA under a separate cover as indicated in Chapter I. Additionally see Response 19.2.

79. How will the company minimize the impact caused by the action of the breakwater that will be built 1.55 km from the beach on the 14m deep isobath, since we know that the normal transportation of sediments to the beach will be altered causing a change in its morphology?

Response 79

The jetty or trestle has been designed as a piled trestle to minimize resistance to waves and current at the site, thus minimizing any effects on sediment transport. Further, the low current velocity at site, as measured by Acoustic Doppler Current Profiler, has been shown to change with tidal influences from a predominantly northwest to southeast direction during the year further, further minimizing any effects from the project. Although the trestle has a minimum profile to impact sediment transport, the installation of the berm breakwater may cause the formation of a salient from the current shoreline. Attachment 79a is an excerpt from the United States Army Corps of Engineers Coastal Engineering Manual on Nearshore Breakwaters and their effects. For our application, the distance (Y) from shore to the centerline of the breakwater is 1.5 kilometers and the length of the breakwater (Ls) is 0.8 kilometers for a Ls/Y ratio of 0.53 which indicates that a tombolo will not occur and that a limited salient may develop depending on the available nourishment and the long shore transport involved from low velocity currents and long period waves.

Attachment 79b is a table of measured sediment in March 2003 taken from traps located along the designed trestle line at the site indicating about a 71.5% inorganic and 28.5% organic material of very fine to silty sediment being transported along the

coast by the low currents. Attachment 79c shows the size of material being transported is very small in size, it is beyond current calculation procedures to determine exactly how much salient may build up due to reduced wave action and currents from the breakwater.

Module SO-7 included in Chapter V, of the EIA defines a monitoring program of the coastline, prior and after construction activities, to be conducted between 1 km south and 3 km north from the boundaries of PLNG property. Perpendicular transect lines of 150 m from the shoreline will be established to obtain profiles of the dry and submerged zones. Visual surveillance along study area of the coastline will be also conducted. Accretion and erosion rates will be determined thru monitoring program. And if significant changes are identified correction measures will be designed and implemented Please see Responses 52, 54, 55, 56, 59 and 75 for more details concerning pre and post project monitoring plans and mitigation techniques being employed by PLNG to minimize impacts on the coastal ecosystem.

80. How will the company minimize the water turbidity, which may affect the marine species and habitat, causing a reduction in light and the obstruction of respiratory mechanisms of sea species?

Response 80

In Operation

As presented in Section 2.6.3 of Chapter III, the sediments of the study area have been characterized as fine sands. The swell at the site has sufficient energy to put this material in suspension and the residual component of the weak coastal currents will move the sediments northward in the period June to September and southward the rest of the year. The existing seabed, under the influence of these waves and currents, is frequently a turbid environment, and the project will do nothing to change those conditions except in the lee of the breakwater where the wave climate will be diminished and there will be less locally generated turbidity.

During Construction

A suction dredge will be employed to dredge the access channel. This dredge works by sucking seabed material from the seafloor. The seabed material settles in the dredge's tanks while the entrained seawater overflows the tanks and is discharged back into the sea. Some of the fine materials in the seabed sediments will fail to settle in the tanks and will be discharged with the decanted seawater.

When the dredge's tanks are full it sails to the disposal site and discharges the dredged material through gates in the hull of the barge. Most of the material falls to the seabed as a density plume but some material goes into suspension. The material that falls to the seabed is subject to periodic resuspension and transport, as are the natural sediments at the disposal site. This process causes the dredge spoils to mix with the existing seabed sediments as they are dispersed.

Construction Impacts and Monitoring

As described in Section 3.2.2 of Chapter III, the species and habitat encountered and evaluated during baseline surveys were found to be tolerant of high turbidity levels. Although there are no reference values defined in Peru for marine species turbidity tolerance, the World Bank indicates that turbidity should be monitored and maintained below 200 mg/L, particularly during critical spawning and other set periods for shellfish (See Environmental, Health and Safety Guidelines for Port and Harbor Facilities by IFC, 1998). Turbidity levels similar to those suggested by the World Bank have been observed at the Port of Callao, where fishing activities are regularly conducted, without any relationship observed between high turbidity level and the harvest of fishing species.

However, as indicated in module SM-2 of Chapter V, daily turbidity monitoring will be conducted in the water column at 3 different stations located at 600 m distance from the work area on the north and south boundaries (location of stations on Figure SM-2.1) to help reduce the extent of the sediment plume from the work area. This monitoring program is designed to provide an early warning of increasing turbidity levels above background conditions. If turbidity values are recorded at the monitoring stations at 200 mg/L above ambient conditions, measures will be taken to impede migration of the sediment plume and to reduce turbidity levels, (e.g., reduction of dredging speed or work stoppage) and avoid migration of the turbidity plume outside the immediate impact area of the project.

Please see Responses 52, 54, 55, 56, 59 and 75 for more details concerning pre- and post-project monitoring plans and mitigation techniques being employed by PLNG to minimize impacts on the coastal ecosystem.

81. Submit the Specific Contingency Plan and indicate the equipment to be used to address any emergency from the barges that will transport the materials to be used in building the breakwater.

Response 81

A specific detailed contingency plan will be prepared and submitted for this construction activity at a later date. At this stage of the project, the details of the actual construction equipment to be used, specifics of the construction methods that will be employed and work plan are not known. The construction contractor is required to provide this plan and implement all procedures as part of his subcontract requirements. As shown in Chapter V, Section 4.2.2.6 - General Approach to the Contingency Plan, PLNG will prepare a Contingency Plan for the Operation of the LNG Export Project, which will be based on the risk analysis related to the operation of the plant and marine Facilities. The Contingency Plan for spills and emergency response during plant operations shall be submitted to the General Bureau of Hydrocarbons (DGH) and OSINERG for its approval as stated in the Environmental Protection Regulations for Hydrocarbon Activities (Supreme Decree 046-93 EM, Article 23). Also, the contingency plan for spills and emergency during marine facilities operations shall be submitted to the Harbormaster's Office of the corresponding jurisdiction, for its review and approval as stated in the Administrative Procedures Unified Text ("Texto Unico de Procedimientos Administrativos") of the Peruvian Navy, and following the guidelines approved in the Directorate Resolution N° 0497-98/DCG. The contingency plan of the installations shall adhere to the National Contingency Plan and to the Local Contingency Plan of the corresponding Harbormaster's Office. The preparation of the Contingency Plan will have to take into account the following written procedures regarding the "ship – dock" interface, specially recommended by the International

Maritime Organization – IMO (communications between the parties and responsibilities). As supplement of these documents, the checklists (Ship/Shore Safety Check List), Parts “A” and “C”, promoted by IMO and written by the “Society of International Gas Tanker and Terminal Operators Ltd” (SIGTTO) will be adapted.

82. Submit the specific biological monitoring program related to the appearance of new species and the formation of an ecosystem over the breakwater.

Response 82

As noted in Responses 54 and 55, PLNG will conduct a continuous marine biological monitoring and evaluation program during the construction and operation stages.

During construction, three transect lines (see module SM-6) represent the direct area of influence of the project. Water column monitoring will be conducted at five stations on each transect line during autumn and spring of each year (see Figure SM-6.1 for locations). The objective of the monitoring program is to observe subtidal and intertidal marine communities, augment baseline data and evaluate and identify sources of variations attributable to project activities. The same parameters as those evaluated during the EIA baseline will be monitored and will include the following:

- **Hydrographic and marine circulation parameters:** Temperature, Salinity and Current velocity;
- **Physical and chemical quality parameters:** Dissolved Oxygen, pH, TSS, Total Nitrogen, Organic Nitrogen, Total Phosphorus, Sulphates, Chlorophyll and granulometric analysis of sediments;
- **Microbiological and organic parameters:** BOD5, Total Coliforms and Fecal Coliforms;
- **Biological parameters:** Benthic, Plankton and Fish.

Data from this monitoring program will be integrated with data collected during monitoring of physical and chemical parameters of marine sediments as presented in module SM-5. Marine sediments will be collected at these same transect lines, but only at three stations on each transect (see Figure SM-5.1 for locations). Annual monitoring will also be conducted during autumn and spring and the samples analyzed for the following parameters: Arsenic, Cadmium, Copper, Chromium, Mercury, Lead, Zinc, Nickel and TPH. This data will also be compared with baseline sediment data to evaluate and identify sources of variations attributable to project activities.

In addition, the data will be integrated with marine water quality data as described in module SM-2. As per the monitoring of sediments and marine biological schemes described above, physical-chemical and bacteriological parameters as listed on Table SM-2.5 will be monitored in the water column every three months at these same transect lines and stations. Additionally, daily monitoring of turbidity levels at water columns on two transect lines located at 600 m north and south (three stations per transect) of the work area will be conducted during dredging activities. Location of monitoring stations for marine water quality is provided at figure SM-2.1. The purpose of this monitoring program is to collect data that can be compared to the water quality data gathered during baseline studies to evaluate and identify sources of variations attributable to project activities.

At the completion of the construction stage and the commencement of operational activities, the monitoring program as previously described will continue according to provisions provided at module SO-4 "Monitoring of Marine Ecosystem" in conjunction with modules SO-3 "Monitoring of Marine Sediments" and SO-2 "Monitoring of Water Quality". Water quality parameters such as physical – chemical and bacteriological parameters will be monitored every three months, while sediment and marine ecosystem parameters will be monitored during autumn and spring. Similar to the monitoring during the construction stage, the objective of the monitoring program during the operational stage is to observe the subtidal and intertidal marine communities and continue augmenting baseline data in order to evaluate and identify sources of variations attributable to project activities.

GENERAL ASPECTS

83. With regard to Liquid Waste Management:

83.1 Submit the Procedure for Portable Sanitary Facilities with regard to the maintenance, collection, transportation and final disposal of waste.

Response 83.1

As noted in Response 19.4, during the construction phase the temporary camp facilities that will house the workers will be self-sufficient and will include sanitary wastewater collection and treatment as described in Section 3.1.1 of Chapter II. The sanitary wastewater will utilize portable chemical toilets that will be collected and disposed by a licensed disposal subcontractor. Sanitary waste from the plant area and employee camp area during the operation phase will be treated in packaged treatment units (two units as presented in Figure 22 on Chapter II), where the wastewater will undergo biological oxidation, clarification and oxidation. Treated effluent will be used for irrigation purposes as described in Section 2.3.11.4 of Chapter II or disposed at sea under Peruvian permit. The packaged treatment plant will be designed to treat a volume of sanitary waste generated by the LNG plant and permanent camp has a design capacity of 30 and 50 m³ /day respectively. The effluent will be monitored to ensure compliance with the World Bank Guidelines as presented in Section 4.2.2 of Chapter V (Module SO-2 and Figure SO-2.1). Chapter V provides the management plan (MR-1) that establishes the procedures and guidelines for the management of wastewater generated during the construction and module, RO-1, for the operation phase of the project as well as the management of sludge from the treatment units.

USE OF PORTABLE TOILETS BY THE PERSONNEL

This service is related to the integral management and disposal of wastes, to thus protect and preserve the quality of the environment, in accordance with the Environmental, Health and Safety Policy, Peru's Regulations, and the recommendations made by International Organizations.

This service will be provided in accordance with the guidelines set forth in the General Health Law N° 26842 and the Sanitary Regulations for Environmental Sanitation Activities approved by means of Supreme Decree No. 022-2201-SA. The company to be finally selected to provide this service must guarantee that it has been formally incorporated and is in a capacity to properly manage wastes. In addition, it should

have obtained the necessary authorizations to thus offer appropriate sanitary conditions to the workers.

The use of portable toilets on a permanent basis and in a given area will be limited to 20 users per day.

PORTABLE TOILET MAINTENANCE:

Portable Toilet Cleaning and Maintenance shall abide by the following rules and definitions:

Definition of Portable Toilets.

Portable Toilet shall be understood to mean a small cubicle or toilet unit installed in places where sewer- connected sanitation is not available, in order to provide sanitary facilities for the people's comfort and convenience.

How they work

To operate, portable toilets require a biodegradable liquid compound that is mixed with water to form a solution that controls odors and the biologic activity of wastes. The liquid compound is mixed with 20 liters of water, to thus comply with the specifications of the detergent's manufacturer and guarantee that the product is inoffensive for treatment plants.

Characteristics

Portable toilets are made of high-resistant material, either injected plastic or fiberglass. A portable toilet looks like a personal booth, its minimum size being 1.0 x 1.0 x 2.00 m. The toilet tank should have an appropriate capacity (200 liters).

Cleaning Frequency

A portable toilet should be serviced two or three times a week if used by 20 people, as on the third day it will have reached 50% of its total capacity.

A portable toilet should also be cleaned if there is an imminent risk of contracting infectious diseases.

Portable Toilet Cleaning

To clean a portable toilet, the following steps should be taken:

To install portable toilets in any given area, attention should be given to existing access facilities.

- The toilet service should be suspended until cleaning work has been completed.
- Used toilet paper (waste bags should be tightly closed and removed) and other objects disposed of inside the portable toilet unit should be removed.
- Wastes stored in the portable toilet tank should be pumped into the truck holding tank.
- The interior of the toilet should be cleaned by scrubbing with a brush and water.

- The mixture should then be prepared (4 ounces of detergent mixed with 20 liters of water). Using a plastic broom, a small amount of the mixture should be used to wash the interior, that is, walls, floors and the bowl.
- The toilet should then be flushed using the rest of the mixture. (approximately 19 liters)
- A deodorizer can then be used.

83.2 The company must specify what the water treatment system will be (septic tank with infiltration field or Compact Plant) for household residual waters to be implemented during the construction and operations stage of the project. In order to select the method, the technical, environmental and social implications must be taken into account. Also, indicate what method will be used for sludge treatment.

Response 83.2

Refer to Responses 39.3 and 40.3.

83.3 The hazardous liquid wastes that cannot be recycled in Peru must be transferred abroad by the operator Peru LNG. This must be a commitment undertaken by the company.

Response 83.3

There are no hazardous liquid wastes generated by the LNG Plant construction or operations that must be transferred abroad by operator Peru LNG. The aMDEA acid gas removal solution from BASF operates in a low temperature basis so that fouling or deterioration with waste or reclaiming of spent amine does not occur. The hot oil medium of Therminol 55 will also be operated in a low temperature process with no fouling with spent or deteriorated medium or reclaiming required. All other liquid wastes such as the desalinated brine solution and lubrication oils will be handled on site or at an approved recycling facility in Peru.

83.4 Submit the design and technical characteristics of atmospheric emissions of the incinerator for hazardous liquid wastes.

Response 83.4

Local recycling companies will be used for disposal of oily wastes. The incinerator will operate only intermittently and expected to be used for solid waste only. It is expected to operate no more than 1000 hours per year with insignificant air quality impacts. (Please see Attachment 83.4 of typical incinerator specifications).

83.5 Submit the procedure for the treatment of water used in hydrostatic tests in the event the standards established in the Peruvian environmental legislation are not met.

Response 83.5

Preferred hydrostatic-test of lines and equipment is the use of potable water obtained from reverse osmosis and if required, supplemented by water from the Cañete River. Codes requirements of this potable water for hydro test (substantially clean and clear,

no objectionable odors (no hydrogen sulfide), pH between 6 and 8.3 and below 49 °C), meets the Peruvian environmental legislation.

Due to the large volume required, a second option for the hydro test of the LNG tanks is with seawater. If EPC contractor request this option, Owner will make sure if sea water treatment is required, only biodegradable products be used. Also, Owner will make sure returning seawater will meet Peruvian Environmental Legislations.

Also see responses 67 and 68

84. With regard to Solid Waste Management:

84.1 Indicate what the technical and environmental criteria will be to identify the local organizations to which recyclable wastes will be donated.

Response 84.1

The following basic criteria should be borne in mind at the time of identifying the entities that will benefit from the donation of recyclable products to be made by Peru LNG:

- The donation recipient should have been legally incorporated. It must be a non-profit social organization, preferably located within the direct area of influence of the Project.
- Recyclable material will be donated to an organization that has its own waste treatment facilities or an agreement with an authorized company or companies to operate, thus guaranteeing that wastes will be disposed of in compliance with the environmental guidelines in force and assuming full responsibility therefor.

84.2 Submit the Training Program given to the personnel in order to identify the garbage cans or containers by colors to systematically select the different wastes.

Response 84.2

The PLNG waste management program and associated training modules will not be fully developed until the project has been approved. However, the general waste management plan calls for labeling of waste containers and waste storage areas to identify them as containing Hazardous or Non-Hazardous waste. The most likely color scheme will entail using green to designate Non-Hazardous Waste, Yellow to designate Hazardous Waste, and Red to designate Pathogenic Waste. In addition, the waste label will probably also allow for indication of the actual chemical constituents present in the container, the material's associated hazard level in the form of the HFS diamond and the dates on which each material was first put into the container. Each label will also likely include a unique number for managing and tracking the containers.

Training for the associated program will entail the use of all 3 modes of training, i.e., visual, auditory, as well as hands-on activities. It will not only cover waste labeling, manifesting and tracking, but will also deal with the hazards associated with potential plant wastes and how to mitigate or control those hazards. Personnel will likely be required to take and pass an associated test before they are allowed to handle plant wastes.

- 84.3 Submit a copy of the agreements entered into with the companies that are in charge of the collection, transportation and final disposal of the different wastes that will be generated during the project's construction and operations stage.

Response 84.3

Any contract for waste collection, transportation and disposal offsite will not be submitted for bids until the project is approved. However, only companies that are approved under Peruvian law for each of these activities, which otherwise meet best industry practices for training of personnel, maintenance of equipment and facilities, etc., and which are inspected and approved by PLNG environmental management will be allowed to bid on any such contracts. The priority will be give to local companies, if they cannot comply with acceptable requirements, then international companies will be contracted.

It is not possible to provide a copy of said agreements, as no agreement has been signed yet. It should be stressed that the company or companies that will be in charge of providing this service must have obtained all the permits required by the competent authority. PLNG commits itself to provide a copy of said agreements in a timely fashion.

- 84.4 Indicate in what cases bio-reclamation and final disposal by third parties will be implemented. Furthermore, explain the bio-reclamation procedures on site and off site.

Response 84.4

In general, waste management at the site will follow the best management practices of reuse, recycle, treatment and disposal, in that order of preference. Bio-reclamation will be used as an onsite treatment method for all sanitary waste water, sewage sludge other bulk organic-based residues, and residues from spills or maintenance operations, which cannot be recycled and which do not contain hazardous levels of toxic organic compounds, contaminants, inorganic or heavy metals. For all cases where reuse, recycle, bio-reclamation or other onsite treatment methods such as composting are not applicable, wastes will be transported offsite for disposal at approved facilities.

Bio-reclamation procedures for wastewater will consist of aerobic primary treatment and anaerobic secondary treatment with onsite land application of treated wastewater providing both liquid and organic nourishment of grasses and plantings. All treated sanitary wastewater will be monitored for the presence of harmful contaminants and will be diverted prior to land application for further treatment or offsite disposal as necessary.

Bio-reclamation for approved organic residues from spills or maintenance events will be land-farmed onsite using the following or similar methodology: Residues and contaminated soil will be screened to approximately 10 cm to remove debris that could interfere with the incorporation of organic amendments. In situ, the soil is screened to a depth of 60 cm using equipment such as subsurface combs and agricultural rock pickers. Ex situ, the soil is passed over a mechanical screen. For ex situ applications, screened soil is transported to the treatment area and deposited into a low permeability cell (a high density polyethylene-lined earthen cell or a clay or concrete lined cell). The contaminated soils, to a maximum depth of 0.6 m, are mixed with amendments and

periodically tilled, fertilized and irrigated to encourage the growth of contaminant-degrading microbiota. A cover may be used to control soil moisture content and eliminate run-on/run-off and raise soil temperature and accelerate remediation. Irrigation and tillage will continue until the TPH is below 5.0% or concentrations of target compounds have fallen below mandated cleanup levels. The length of time required for remediation is based on many factors including the type and concentrations of contaminants, soil temperature, and soil chemistry.

85. The potable water system proposed in the study has a capacity for 250 persons. Explain how potable water will be supplied to the 3000 persons that will be on site during the peak point of construction.

Response 85

The potable water system with a capacity for 250 people is proposed for the operation stage not for construction stage. As indicated in Section 3.1.5 of Chapter II, potable water during the first year of construction will be “bottled water” until construction of desalinization plant has been completed. The desalinization plant unit will produce treated water at a rate of 30 cubic meters per hour. The construction contractor will be required to provide a potable water system with enough water for the peak of employment during construction estimated to be between second and third year of construction. The potable water system during peak of construction will be probably supplemented with “bottled water”.

86. The company indicates that the treatment of the sanitary effluents will be stored in tanks for the irrigation in the site, this means that a landscaping study was considered with the purpose to improve the coastal ecosystem. If this is the case, please submit the study or explain why you will develop this irrigation.

Response 86

The process is to treat the wastewater effluent and utilize the nutrients in the wastewater. Landscaping is not the prime purpose and is only incidental to the treatment of wastewater to prevent pollution. We will have enough water that landscaping will be a secondary consideration. A final landscaping plan has not been completed, however, due to the arid nature of the site and PLNG's desire to recycle water to the fullest extent possible, treated sanitary effluents will be collected for use in the overall landscape irrigation system. The treated sanitary effluent is of sufficient quality to be used as a source of irrigation water or to be disposed within applicable effluent standards; the applicant has chosen to utilize this wastewater as a resource. The final landscaping plan along with the final design of the LNG Plant and Marine Facilities will be performed by the design-built contractor and will be submitted to DGAA for approval.

87. What type of trees have been planned to be planted in the LNG Plant surroundings in order to mitigate the visual impact and the effect of luminosity?

Response 87

The landscaping plan will be designed using plants that are endemic to the area. These will be obtained from Peruvian nursery and landscape contractors. Drip irrigation is the preferred method to place the largest area under irrigation for plant growth. A landscape architect and irrigation contractor will be employed to design an

optimal landscaping plan. As described in Environmental Management Plan, Module AC-4 in Chapter V, the *Tillandsia latifolia* encountered at the project site will be relocated to a nursery during the construction phase as described and will be incorporated into the overall landscape plan.

88. List the solid wastes and the liquid wastes that will be disposed of in the incinerator as well as recyclable waste.

Response 88

Only non-hazardous non-recyclable solid materials, e.g., spent filter cartridges from process train, spent activated carbon from AGR unit, spent activated carbon from drinking water treatment unit, domestic trash and garbage, are currently planned for incineration onsite.

Medical wastes of less than approximately 2 kg per month would be incinerated if no other viable option is available.

Spent molecular sieve from dehydrators and spent activated carbon from the heavy metal removal unit will be sent offsite to an approved supplier for recycling. API/CPI separator sludge may be sent bioremediated or offsite for recycle/ re-refining depending on its physical properties. Used oils, e.g., lubrication, cooking, etc., will be sent offsite to an approved recycler. Treated sanitary effluent will be used for irrigation onsite.

89. Has an economic valuation been made of the biodiversity loss?

Response 89

The term "Biodiversity" implies variation in life forms (reflected at all levels: ecosystems and species) spatially distributed in a geographic area. Of all life forms identified during baseline studies in marine and terrestrial ecosystems, benthic species located in the proposed navigational channel and breakwater will be affected by removal of substratum and substratum cover at dredged disposal area. The effected terrestrial ecosystems include the *Tillandsia* fields, which will be removed prior to the construction phase and transplanted to a designated area on the site after the completion of the construction phase.

The loss of biodiversity it is considered when an ecosystem or specie is taken to the brink of extinction. The proposed project does not have any species or ecosystems that will be affected by construction of the project or that will disappear from the area.

No economic valuation of the loss of biodiversity has been made based on the following conclusions:

- No loss on biodiversity is expected in the marine ecosystems, since individual, non-critical benthic species and portions of substratum will be directly impacted. Construction of the breakwater will result in increased biodiversity of the area by providing an additional variety of substrate and habitat for colonization.
- No loss on biodiversity is expected in the terrestrial ecosystems, since removal of *Tillandsia* plants affect only individual plants of this endemic plant that grows within

most of Peruvian coastal deserts. In addition, mitigation measures have been incorporated in the environmental management plan that include the transplant of these plants prior to construction and replanting at designated areas of the plant after the construction has been completed.

90. Earthworks will be carried out during construction, which will generate a lot of dust. How will this impact be mitigated?

Response 90

The maximum air quality impacts during construction are expected to be temporary and intermittent associated with the use of heavy equipment during earthwork operations during clearing, grading and compaction of the site. The emission from these sources is primarily potential dust or particulate matter. Watering disturbed areas as described in Modules AC-2 and AC-4 of Chapter V and minimizing the amount of time that areas are exposed before compacting will control dust during construction. The impacts associated from dust are anticipated to be limited to within 1 km radius from the site.

91. The predicted volumes of solid wastes have not been specified, among which are household wastes (biodegradable, inert and hazardous); pathogen, inert and hazardous), pathogen (medical) and industrial wastes, both hazardous and non-hazardous and semi-solids.

Response 91

Waste volumes for mixed household wastes from the camp are estimated at 0.6 to 1.2 kilograms per person per day or 50 tons per year. This includes paper, glass, plastics, metal and organic waste. The facility will have a clinic to treat minor injuries and as such will only have very small and infrequent amounts of medical wastes, conservatively estimated at less than 0.5 kg per week. Commercial/Industrial waste is estimated at 5 kilograms per day per employee or 200 tons. Office waste is estimated at 0.75 kilograms per employee per day or estimated 7 tons per year. PLNG has provided for a maximum of recycling, reuse, transportation to offsite licensed facilities and then incineration of the remainder. See Response 92.

92. Will pathogen wastes be incinerated? If so, where will the ashes be stored? At what time will the incineration take place? What will the height of the stack be? And what will the composition and the area of influence of the gases generated by the incineration be?

Response 92

Providing it is legally and economically feasible to do so, pathogenic wastes will preferably be sent offsite using approved transporters to an approved disposal facility. However, incineration of pathogenic waste onsite will be maintained as a viable second option for safe disposal of such wastes. Medical wastes will be stored on site in closed containers. See response 91 for estimated amount of medical waste. Design specifications are not yet available for the proposed incinerator, but the facility will be adequately designed, with associated emission modeling performed, to prevent onsite or offsite impacts on human health from unabated pathogens potentially issuing from the incinerator vent stack. See Attachment 83.4 for typical specifications of the

incinerator. The potential emissions of the incinerator were modeled and found to cause no violations of air emission standards. Ashes will be stored and buried on site.

93. It is necessary for the company to include in the EIA a study on the Cost-Benefit of the Project.

Response 93

The costs and benefits identified in the EIA will, overall, be positively modified or mitigated by the environmental management strategies as set out in the Environmental Management Plan and will be monitored during the project and EMP implementation. Please see Attachments 136a and 136b, which show the predicted positive environmental impacts after mitigation measures are implemented for this project. The Project will have an investment of \$1,000 MM US dollars, create (directly and indirectly) approximately 35,000 new jobs during construction and operations, pay royalties and taxes, provide for a positive balance of trade from energy exports, and increase the creation of infrastructure, provide and increase supply of natural gas liquids and natural gas, provide new employment opportunities from increased investment, and provide gas price stability.

OSINERG'S OBSERVATIONS

94. Following are the observations made by OSINERG: The EIA is the base document for compliance with environmental management activities of the project to be developed. Therefore, it must specify the responsibility of the project owner in the performance of the referred Plan. For example, in the performance of hydrostatic tests, radiographic tests of pipe welded joints, etc. The EIA must stress that the responsibility for the project lies with the project owner in all operating, construction, environmental aspects, etc.

Response 94

Peru LNG S.R.L. is the titleholder for the LNG Project and commits to construct and operate the plant as per the safety and environmental regulations of Peru and by the standards and specifications referenced in the EIA.

Section 4.1.1 of Chapter V clearly expresses that PLNG is ultimately responsible for the implementation and oversight of all the Management Programs described in the EIA. The goals of the EH&S Management System including the support of resources, commitment, and accountability is well described in Section 2.2 of Chapter V. PLNG will have a construction manager present on-site during the construction phase of the project and a Plant Manager during the start-up and plant operations on a full-time basis. An EH&S Manager and a Community Relations Officer will also be assigned to the staff and will report directly to the Construction Manager or the Plant Manager. The PLNG organizational structure for the project is presented in Figure 1 of Section 4.1.1 of Chapter V. Company responsibilities are also referenced in Response 3.

95. The EIA must specify the project's location according to the political division of Peru, since it has been indicated that it is located between km 167 – 170 of the South Pan-American Highway. The EIA does not establish the jurisdiction where the project will be carried out. It is mentioned in the executive summary but not in the main document.

Response 95

The jurisdiction where the project will be carried out is on a 521.0012 hectares arid coastal site at Pampa Melchorita, located between the 167 to 170 kilometer (km) markers south of Lima on the west side of the Pan Americana Sur Highway. The corresponding registration card shows that it is located in the district of San Vicente de Canete, province of Canete, Department of Lima. The location is described in the Section 1 of the executive summary. Jurisdiction of project location is also stated in Volume 1 in the following sections: Chapter I, Introduccion; Chapter II, Situación Legal del Predio Seleccionado; Chapter III, Section 1 Introducción, Section 5 Ambiente Socioeconomico, Section 6.2 Caracteristicas Arqueologicas de Pampa Melchorita; Chapter VI, Identificación de Grupos de Interes en el Area de Influencia del Proyecto. See Attachment 95 that contains a copy of the letter sent by the SBN, copies of the registration cards related to this answer and the SBN chart registered in the Public registry of Cañete that shows the area where the plot of land is located.

96. With regard to the Management Plans and Projects for the Construction State, the socio-environmental management programs established for the construction stage will be performed by the construction contractor and its subcontractors under the supervision of the designated EHS group. It is necessary to indicate that the responsibility for the Management Programs lies with the project owner together with its representatives expressly designated to supervise the execution thereof.

Response 96

The responsibility for ensuring that the Management Programs for the Peru LNG Export Project are implemented through its representatives or contractors rest with the Titleholder. Also see Responses 3 and 94.

97. The national and foreign personnel hiring program must be detailed, since during the operation and maintenance stage of the plant it has been contemplated that the personnel will consist of approximately 80% foreign employees and 20% national employees and 80% national employees in 10 years. If the project start-up takes three years the situation proposed for the project must be in line with the national labor legislation.

Response 97

During the construction stage which, by its very nature, requires a great deal of manpower, PERU LNG S.R.L. will give priority to the hiring of national personnel, particularly workers from the direct area of influence of the Project, Cañete and Chincha.

However, for technical reasons, and mainly due to the fact that this may be the first plant of its kind, not only in Peru but also in this part of the world, foreign personnel might be required. Expats will be hired in accordance with the provisions set forth in the Law on Expat Hiring (Legislative Decree No. 689) and the Regulations thereunder, thus complying with the applicable Labor Regulations. of Peru

During the operations stage, the hiring policy may be similar to that applied during the construction stage, in keeping with the commitments assumed in the EIA, concerning

the replacement of foreign personnel by national personnel, to the extent possible. A Training and EHS Management System will be implemented to ensure high quality employees are maintained.

98. It is necessary to further specify the policy to hire local skilled and unskilled labor.

Response 98

The framework of a hiring policy has been established in the EIA. As the project proceeds to the final design and construction phases the framework established in the EIA will be implemented with overall oversight by PLNG's Construction Manager and/or Plant Manger to ensure that all specifics elements and goals of the hiring strategy are implemented and that corrective actions are taken as needed. Section 4.3.2 of Chapter IV indicates that the direct on-site labor demand is estimated to be 120 workers for the first year, 1,324 workers for the second year, 2,670 workers for the third year and 670 workers for the fourth year. The base operating and maintenance staff will consist of a staff of around 100 persons. As described in the Environmental Management Plan GS-3 Module: Support in the Hiring of Local Labor Force, PLNG will develop a hiring strategy for hiring local labor force which will include the following elements:

- The contractor selected to build the project will have a clause in the contract with PLNG to promote the employment of local labor with a preference of the communities in the direct and indirect area of influence of the project.
- The Community Relations Officers will inform the community of manpower, skills and hiring requirements and coordinate with the community to ensure the mechanisms for hiring based on transparency and equality.
- The community will be informed regarding the type of laborers required (semi-skilled and skilled), the duration of employment, and requirements to apply in the offices that are going to open in Canete and Chincha.

The hiring policy described in the EIA provides the necessary framework to ensure that staffing needs are met while striving for hiring goals and while maintaining the necessary safeguard is to ensure the safe operation of the plant by qualified and trained staff.

Construction of the Breakwater

99. It is necessary to provide further details on the environmental management of the coastal sector; for example, the dredging canal which implies moving the entire seabed, disturbance (decrease) of the water biota (impacts and mitigation), etc.

Response 99

Environmental management measures provided in Chapter V (Modules AC-8 and SM-2) for dredging of the navigational channel considers the following:

- Use of suction dredging technology for building the navigational channel to reduce increasing of turbidity levels during such construction activity;
- Physical and chemical characterization of material to be dredged to determine presence of pollutants and avoid their dispersion (in the work area or in final disposal area);
- Daily turbidity monitoring at water column during dredging at designated locations along the perimeter of the working area (3 monitoring stations at 600 m North and 3 monitoring stations at 600 m South) in order to alert management of elevated levels of turbidity arising from dredging operations;
- Implementation of management measures when turbidity levels registered at daily monitoring stations are greater than 200 mg/L such as: work stoppage or a reduction on cutting and suction speed to allow the turbidity levels to reach background levels. These modifications on dredging activities will avoid affecting neighbor areas, biota and fishery activities.

Also, during dredging operations and other marine construction activities, an environmental monitoring program will be conducted to monitor the water quality as described in monitoring module SM-2, to monitor marine sediments as described in monitoring module SM-5, and to monitor marine ecosystem as described in monitoring module SM-6. This monitoring program will continue during operations stage to assess any potential changes derived from constructed marine structures or from LNG loading and maintenance operations (as per modules SO-2, SO-3, SO-4 and SO-7 in Chapter V). Other responses that address this topic are Observations 44, 71, 80, 104, 108, 110, 123, 141, 142, 172, 178, and 186.

100. The breakwater will be built using coarse material that will be extracted from an existing or new quarry. The location has not been included and neither the Management Plan for the existing quarry or the new quarry, if required.

Response 100

The titleholder is obtaining mineral concessions on three different quarry sites (existing or new) of which only one will be selected for use in the project. The selection of the quarry site to be used will not be determined until an EPC Contract Bid Package is sent out and bids are received. Once the bids have been evaluated and it has been determined which quarry site is most effective for the project, a separate EIA will be filed for that quarry site. None of the potential quarries being considered is in the Paracas Reserve buffer zone. Any material required to construct the Plant and marine facilities will be obtained from either a licensed and approved quarry or from a new quarry that will be evaluated by conducting an EIA under a separate cover as indicated in Chapter I. Additionally see Responses 19.2 and 78.

Noise Modeling

101. The components of the Environmental Impact Assessment must be in the Spanish language. Therefore, the noise modeling must be translated in order to be accessible to anyone who may be interested.

Response 101

Translation of the KBR document "Feed Noise Report" presented in Volume 2 – Appendix 3 is presented in Attachment 29.4 of this document. Results and model interpretation of this document are already given at Volume 1 Chapter IV, section 4.1.2.

Contingency Plan

102. The Contingency Plan must consider the guidelines described in Directorial Resolution No. 0497-981DCG and the requirements set forth in Supreme Decree No. 046-921EM (Article 23); furthermore, it must be developed in the document, and not limited to a description of the regulations.

Response 102

A Contingency Plan will be present in all project phases, as follows:

- a. In the EIA, as part of the Environmental Management Plan;
- b. In the construction stage, when compliance therewith will be enforced by the Contractors, Subcontractors and PERU LNG's organization; and
- c. In the Operations Stage, when compliance therewith will be enforced by the Plant's operational personnel.

The Contingency Plan included in the EIA (Volume 1, Chapter V and Volume II, Annex IV of the EIA) has been subdivided into two components: Marine Environment (prepared following the Directorial Resolution No. 0497-98/DCG) and Terrestrial Environment (Supreme Decree No. 046-93/EM, article 23) (Plant area and surrounding environments) in accordance with the applicable legislation and contains general guidelines that should be further elaborated both during the Construction stage, as well as during the Operations stage.

The Guidelines for the Preparation of the Environmental Impact Assessment, contained in Annex 2 "Guidelines for the Environmental Impact Assessment (properly adjusted based on the World Bank's Guidelines), make reference to the Environmental Management Plan, described as the compilation of special environmental mitigation measures incorporated into the Project Plan, the contingency plans, the monitoring plans, the training programs, the consultation programs, etc.

This is because the Detailed Design Manual and Operations Manual, which are necessary for the preparation of a detailed Contingency Plan, are not available.

The Contingency Plan for the marine environment has been prepared in keeping with the guidelines established by the General Bureau of Harbor Masters' Offices and Coastguards, and has been filed as part of the EIA. Note that the Contingency Plan for the marine environment has been developed further and now includes an updated oil spill contingency plan and revised equipment list. Please see Response 180 for full details. This Contingency Plan is a dynamic document that will be updated and reported to the Port Authority every time the number and type of vessels working in the area may change.

Contingency Plan for the construction stage on land

This document will be filed with OSINERG, along with basic and detailed engineering information, for it to be audited at two different times:

- For the Installation Authorization
- For the Use and Operating Permit

a) For the Installation Authorization - A Contingency Plan is required for the construction stage. It should be prepared in greater detail and should specifically focus on the Safety and Health Policies for construction projects established by the Engineering, Procurement and Construction (EPC) company in charge of Construction work and PERU LNG's organization.

As requested in OSINERG's TUPA 2 A, the Contingency Plan is an indispensable condition to be met to obtain the Favorable Technical Report required for the Installation.

It is worth pointing out that during this stage, the Contingency Plan of an Industrial Plant is barely different from the Contingency Plan of a Contractor engaged in the construction of a Housing Complex because, as we know, there is no risk of there being major oil or fuel spills like those that may occur in a plant that is already operating. Therefore, there will be no such risk until the commencement of operations. The risks involved in the construction stage of both projects are basically similar (earthworks, transportation of material, machinery fuel, welding work, fall risks, waste generation and disposal, etc.)

b) Use and Operating Permit - During this stage, the Project Construction Manual, which shall contain detailed Project engineering information, the Operations Manual and a detailed Project Organizational Chart, shall be filed with the competent Authority and shall be made available during this stage.

The Contingency Plan is one of the requirements to be met to obtain the Favorable Technical Report, which should be delivered upon completion of the Project construction work, according to TUPA 3A.

The Contingency Plan for this stage must comply with the provisions set forth in Article 23 of Supreme Decree No. 046-93-EM. In addition, it must be filed with the DGAA for approval and must be updated once a year.

Within this context, the Contingency Plan must be prepared in greater detail, including:

- The Emergency Manual, in accordance with the provisions set out in Article 23 of Supreme Decree No. 046-93-EM, for the purpose of establishing the procedures to be followed by PERU LNG's plant personnel to become organized and assume specific functions to detect, control and timely and efficiently offset any emergency that may result from acts of God, human factors or mechanical breakdowns, such as land spills, explosions, fires, earthquakes and accidents. It will be

filed with the DGAA for approval. Once approved, PERU LNG assumes the commitment to update it on an annual basis.

- The Manual on Hydrocarbon and Hazardous Substance Spills into the Sea must be prepared in keeping with the directives set forth in Directorial Resolution No. 0497-98/DCG. This Manual will be filed with the General Bureau of Harbor Masters' Offices and Coast Guards for approval. Similarly, once approved, PERU LNG assumes the commitment to update it on an annual basis.

In view of the foregoing considerations, we hereby request the approval of the Contingency Plan filed as an Annex to the EIA. PERU LNG commits itself to file detailed Contingency Plans for each Project stage.

Sanitary Residual Water

103. There is no indication of the volumes to be treated and the capacity of the treatment plants.

Response 103

The capacity of the wastewater treatment units is 50 cubic meters per day for the community and 30 cubic meters per day for the plant offices and buildings unit. Actual usage is based on a maximum 0.2 cubic meters per person per day usage at for the community and 0.05 cubic meters per person per day for the plant with a staffing of no more than 180 people. This equates to 36 cubic meters per day for the community and 9 cubic meters per day for the plant unit.

Figure 22 of Chapter II provides a block diagram of the effluent water treatment. In addition, Chapter IV page 45 and Chapter V Table RO-1.1 page 126 provide the description of the various effluent streams and treatment capacities; and the Liquid Waste Management Environmental Management Plan, respectively.

Dredging of Access Canal for LNG tankers

104. The environmental treatment of bottom sludge must be specified, as well as where they will be deposited, the effects of currents and the degree of dispersion of this sludge.

Response 104

The dredged material is clean sand, silt and gravel material without any contaminants as reported by bottom samples and soil borings taken in 2003. No treatment or conditioning of the dredged material will be necessary. The dredged material will be placed in a 2 kilometers by 2 kilometers area beginning 8 kilometers directly offshore from the proposed Pampa Melchorita LNG site. Samples of sea bottom materials at the dredging location and the disposal area have been tested. The sea bottom materials have been tested for biological, chemical, and physical characterization and the seawater column have been checked for gradation, suspended solids, nutrients, biota, chemicals and hydrocarbons. Details of the location and testing are provided in the

Annex 6 of Volume 2. Additional testing was also performed in November and December 2003 with the results presented as Attachments 172A through 172G. Comparing the analysis of the material to be removed and the natural material in the storage area shows that no treatment is necessary.

A description of the operations plan, environmental management plan and monitoring program is also provided in Annex 6. As indicated in Response 54, the monitoring program will continue until the bio system has been shown to be stable as compared to baseline conditions. It is expected that marine life will leave the immediate area due to the temporary increase in turbidity from dredged material placement and will only return once the activity has ceased. Turbidity measurements will be taken to ensure that there is no effect outside the work area.

The amount of dredging material stored should raise the sea-bottom depth at the disposal site a nominal 0.8 meters from the existing bottom depth that ranges from 20 to 33 meters. Geophysical and marine biology data has been obtained over the area and no adverse effects to ship navigation or marine life should occur.

Peru LNG has also conducted various mathematical modeling using specific site measurements and data to show how the dredge spoil will be distributed on the seabed in the designated disposal area. This detailed study was conducted to understand the dispersion of spoil that are made up of gravel, sand and silts. This dense mixture of sediment and water falls rapidly through the water column where the majority forms a mound on the seabed. This mound is then subject to the same long-term transporting process as the ambient sediments at the location resulting in spreading of the material over the seabed and mixing with the natural sediments. The dumping process and the long-term stability of the disposal mounds were analyzed separately. To support the analysis, the currents and waves were measured for a period of 30 days in the center of the 2 km by 2 km disposal site.

The US Army Corps of Engineers STFATE (Short Term Fate) model was then used to demonstrate how dredged material would behave during the descent through the water column. As different sizes of material will have a different vertical velocity profile the spoil make-up was conservatively assumed to be 70% fine sand, 20% coarse silt and 10% of fine silt to ensure that the components with the highest potential for dispersion are modeled. Each standard size spoil deployment would be approximately 6,500 cu m in size. The STFATE model predicts that all of the fine sand will have settled to the seabed within 50 minutes forming a mound approximately 100 m in diameter by 1 m high. The coarse and fine silt fractions will remain in suspension for longer time periods forming a density cloud that descends through the water column and disperses over time. Two hours after discharge, only 0.9% of the coarse silt is predicted to remain in suspension with the remainder settled to the seabed. The fine silt under the modeled conditions forms a thin layer of suspended material within a few meters of the seabed. Two hours after discharge, concentration levels exceeding 200 mg/l are locally confined to the bottom few meters of the water column and concentrations exceeding 50 mg/l are restricted to an area approximately 250 m radius of the disposal location. It should be noted that the existing seabed sediments at the same location are likely to be equally if not more mobile than this fine silt spoil material.

Another US Army Corps of Engineers model, LTFATE (Long Term Fate), was used to predict the long-term evolution of the mound shape and position as a function of the ambient wave and current conditions and the material grain size. The mound geometry predicted by STFATE was used as input. LTFATE predicted that essentially no long-

term movement of a dredge spoil mound would occur in the designated disposal area. Other methods that give a higher consideration of the effects of the surface waves on sediment mobility were also used for comparison. These more conservative analyses indicate that individual mounds of spoil would be subject to reworking and mixing with the natural seabed sediments. The result after several months would be a general smoothing of any peaks of the dredge mounds and dispersal and mixing with ambient seabed materials.

Please see Attachment 104 for the detailed analysis report.

Social and Community Management

105. The Social and Community Management Plan does not include a Local Development Plan.

Response 105

The response has been previously provided in Response 6. PLNG is currently preparing the Community Relations Plan. This Plan, as explained in our answer to Observation 14, will be brought into agreement with the Strategic Development Plan for the direct area of influence. For this reason, the company is holding talks in order to bring it into agreement with local development plans.

Identification and Evaluation of Impacts

106. The analysis of the impacts shown in the matrixes is not submitted. The impacts are identified and weighted with a relative value without analyzing the data shown.

Response 106

All potential impacts identified in the EIA will be modified or mitigated by the environmental management strategies as set out in the Environmental Management Plan and will be scored by the monitoring program during the project and EMP implementation. Please see Attachment 136a, Table of Impacts after Mitigation showing the predicted environmental impacts after mitigation measures are implemented as being positive compared to the impact matrix originally included in the EIA in Chapter IV prior to EMP implementation.

Volume 1, Chapter IV contains the following process and methodologies: Impacts Identification (Section 2); Impacts Assessment (Section 3) and Impacts Analysis (Section 4). Section 4 of Chapter IV (pages 16 to 58) provides an interpretation of all impacts presented in the matrixes provided at Table 6 and Table 7 in section 3.2. of the same Chapter and of Table 1 presented at the Executive Summary.

Breakwater construction

107. The geomorphologic changes expected from the construction of the breakwater on the coast and the action of currents must be indicated.

Response 107

As a result of a breakwater risk evaluation following items were identified:

- Marine environment growth in the breakwater and LNG loading area
- Marine dynamics modification in the breakwater and LNG loading area
- Coastal line changes.
- Vessel transit.
- Landscape.

The breakwater impact in coastal geomorphology has been estimated in the basis of the wave, currents and marine sediments studies that showed a very quiet area in the protected side, promoting the coastal strip to grow towards the sea, in the direction of the more frequent coming waves.

Expected effects of Breakwater are considered moderate in the basis of following aspects evaluation:

1. Distance from the coast to breakwater: 1500 m.
2. Permanent wave action in the breaking zone, that even with decreased magnitude still maintain the sediment suspended as flowing northward.
3. Permanent marine currents action, that even with decreased magnitude still maintains the sediment suspended as flowing northward.

Monitoring Plan for coastal geomorphology changes has been designed with a semestral frequency in order to evaluate the need of remedial measures.

Construction and operation area restricted to vessels transit: This effect in expected to be moderate mainly for fishermen walking along the costal strip and minimum to fishermen and others in boats in transit.

For security reasons the Port Authority will design a restricted area around the infrastructure (usually a 500 m. strip).

There is no flora at the sandy sea bottom, however both the jetty piles and the breakwater rocks will promote a new ecosystem growth and biodiversity will become increased. This is a positive effect.

There is very few fauna species. Both the terminal and the breakwater will favor the marine population growing that will benefit to fishermen in the vicinities. This is a positive effect.

The restricted area will work in practice as a marine life reserve where many different fish will adapt to new environment characteristics. This is a positive effect.

During constructions machinery would be noticeable and noisy. This effect is considered moderate and temporal.

Pollution risk

There is a high potential risk for contamination generated from fires, spills, liking, especially during loading works.

To minimize these risks all Security rules (Company, Nacional and Internacional) will be strictly followed. There is also a Contingency Plan, as previously described.

The geomorphological changes expected to take place as a result of the construction of the breakwater have been indicated in Volume 1, Chapter IV, section 4, page 40; further explanation is given at Volume 2, Annex 6 prepared by SEHIDRO page 111, page 118, page 121. Please refer to Response 79 for further detail.

Dredging Operations and Sediment Transportation

108. Per each 8-hour dredging shift it has been estimated that the total consumption of Diesel 2 is 1600 gallons and that the total consumption of lube oil is 40 gallons. Specify the fuel supply to the 2 barges and the dredge that will operate to build the access canal.

Response 108

Dredging contractors who have studied the requirements of the dredging work have indicated that around 30 to 40 cu. m. per day of heavy fuel oil and diesel would be needed. They have indicated that they would not mobilize their own bunkering barge and would prefer to use a local service in Pisco and visit the harbor every 18 to 20 days.

At this early stage of the project, the details of the actual construction equipment that will be used, specifics of the construction methods that will be employed and a detailed work plan are not known. The construction contractor is required to provide this fuelling plan and implement all necessary safety procedures as part of his subcontract requirements to the satisfaction of Peru LNG and the Port Authority.

A specific detailed Oil and other Pollutant substances Contingency Plan, required by the Port Authority, will be developed with the purpose of minimizing the effects of the oil spills coming from service boats and the dredger's barges. This Contingency Plan will be prepared and submitted for this construction activity at a later date in accordance with the implementation plan as outlined in Response 102. This Contingency Plan is a dynamic document that will have to be updated and reported to the Port Authority, every time the initial conditions change, as the number and type of vessels working at the terminal.

Biomass

109. An indication must be given of the estimated time required for the biomass to recover in the environment.

Response 109

The biomass that will be impacted by the project, particularly during construction of navigational channel and breakwater, consists mainly of benthic species. According to the results of the baseline study, the biomass encountered during the EIA consists primarily of a few benthic species at sea floor. It is expected that after construction of breakwater, species such as *Semymetilus* may be present in greater numbers and thus a greater biomass than before construction due to the introduction of a larger rocky substratum in the environment.

The time required for biomass recovery is highly dependent on the marine dynamics of the area such as currents, temperature, salinity, velocity and available substratum. In addition, the natural phenomena El Niño and La Niña and man-made activities such as maintenance of breakwater structure and navigational channel will influence the time of recovery of the biomass.

The rocky marine substratum in Peru has have been highly affected by the warming process associated with El Niño, with natural phyto-plankton biomass reductions due to changes in the coastal upwelling. At Ancon Bay, changes in the marine environment and recovery of the biomass were observed after 2 or 3 years after El Niño that occurred during 1982-83.

The navigational channel maintenance dredging is estimated to take place 3 to 5 years after construction is completed. Therefore to estimate the biomass recovery time, factors such as ones mentioned above should be consider to estimate the recovery of navigational channel area and colonization of breakwater substratum and the fact that the marine environment such as Playa Melchorita is very dynamic.

See also Response 12.

Social Management Plan

110. It is necessary to incorporate information on the assistance that artisan fishermen will receive to compensate for the reduced fishing caused by the construction of the pile dock, traffic of vessels to dredge the access canal, construction of the breakwater, taking into account that the activity will cause variations in the biomass housed in this area. The expectations generated by this type of project in the population are very high as regards job opportunities. For this reason it is recommendable to have an explicit labor scheme for the hiring of local labor and disseminated as broadly as possible, as well as a commitment to train unskilled and semi-skilled labor and prepare national professionals.

Response 110

As presented in Chapter IV (pages 52-53), during the construction phase access to a limited portion of the beach will be restricted to protect the fishermen and casual passers-by from the hazards related to the construction of the project. During the operational phase access to the beach area will be restricted as well, but alternative access routes will be provided to the local fisherman so they will have access to the shoreline on the north and south side of the plant. Reduction in access to the shoreline will not diminish fishing activities, since alternative access and aid with motor transportation around the restricted area will be provided to reduce the travel time from one access area to the other or from one end to other of the exclusion zone. The construction activity associated with the marine facilities will modify the marine habitat primarily with the construction of the breakwater, navigational channel, and trestle in areas that will be restricted to non-plant personnel. The breakwater located 1.6 km from the shoreline will not adversely impact the artisanal fisherman and will restrict the fishing vessels near the breakwater and navigational channel.

As described in Section IV (pages 56-58), the construction of the Project will require skilled as well as semi-skilled laborers and certain level of training to meet the

requirements of the construction activities. The duration of the construction activities for a period of 3.5 years will provide a direct on-site labor demand of an estimated 120 workers for the first year, 1,324 workers for the second year, 2,670 workers for the third year and 670 workers for part of the fourth year. These estimates do not include the induced jobs derived from the direct hires referenced above which can be estimated ranging from 600 to 13,350 workers during the construction phase of the project. During the operation phase, it is estimated that 75 permanent jobs will be drawn from the local area to fulfill facility requirements. PLNG is committed to prompting preferential treatment in the hiring of local labor with emphasis in the communities that correspond to the areas of the project direct influence. The Environmental Management Plan Module GS-3 specifies the guidelines for hiring local labor and the measures that will be taken.

Term of Duration of the Plant

111. The planned duration of the plant will be approximately 30 years and may be extended with an adequate operation and maintenance (O&M) based on the broad international experience in the construction and operation of plants. On this aspect, it must be indicated that in the event the planned duration is extended, that in addition to adequate operation and maintenance the corresponding Environmental Management Plans and environmental standards will be complied with during the entire duration of the project; that is, from construction and operation up to abandonment.

Response 111

The extension of the forecasted life of the LNG plant through appropriate operations and maintenance work also includes continuation and compliance with the applicable Environmental Management Programs and environmental regulations as during the early life of the LNG plant. The Introduction of the Environmental Management Plan (EMP) as presented in Vol. 1, Chapter V (page 1) states that the plan incorporates aspects of the project during construction, operation and closure. As previously state the EMP is a living document that will incorporate modifications to the plan as operational as well as applicable regulations change over the course of time.

Future Growth Plans

112. The LNG plant will be built as a single train facility, for a rated production of 4.4 million metric tons per year. The plant area has no space available for a second train and no additional plans or investments have been contemplated for the LNG plant in this assessment. It must be indicated that this EIA does not contemplate additional plans or investments for the LNG plant.

Response 112

There is space within the proposed land area to install additional process equipment and a storage tank for a plant expansion without the need to purchase or rezone any new land areas. Although space has been made available in the layout of the train for the LNG plant as referenced in Vol. 1, Section 1.5 of Chapter II (page 4), no investment has been made for a second train for the plant. Any investment would first require the

submittal and approval of another EIA for expansion from the first train in the LNG plant. PLNG has no plans to expand the process area or the land area at this time and is not included in this EIA. See also Response 22.

Legal Status of the Selected Property

113. The site proposed for the plan will be located in a property purchased from the Superintendence of National Assets (SBN). This 521-hectare property, known as Pampa Melchorita, was previously transferred by the Ministry of Agriculture to the SBN to be sold to the project, at a reasonable market price approved by a Supreme Decree signed by the Minister of Economy and Finance approving the sale. The property will be considered as an industrial area by the Municipality of Cañete. At this point it is necessary to clarify the awarding procedure of the land by NATIONAL ASSETS, which directly sold and awarded to Hunt Oil 521 hectares located in the area of Pampa Melchorita. However, the Regional Government of Lima has issued and published a Resolution invalidating all direct sales and awards as from January 3, 2003. As of the time of this submittal, the PLNG plant site land is not legally cleared.

Response 113

The title to the property is fully clear and is registered in the Public Registry. The company is able to buy the land required for the project directly from SBN. All of the steps required to materialize the sale have been taken, but the property has not yet been bought from SBN who represents the Peruvian State.

The price for the sale of the land was given by CONATA, the national council in charge of valuations.

It is worth pointing out that the sale has not been made, not because of an issue with the company, but rather because of issues between the Peruvian State and the Lima Region.

For this reason, the State is currently negotiating with the Lima Region in order for the respective sale to be made within the shortest possible term.

Project Components

114. The natural gas from the Camisea Project is processed at Malvinas where it is filtered, dried and propane, butane, naphtha and other heavier components associated with gas area removed. The sulfur components in this gas are unknown. It is necessary to make sure whether or not this gas has sulfur components in order to contemplate their environmental management, if appropriate.

Response 114

Recent sampling results from the well completion of San Martin 1004 indicate that no sulfur exists in the raw natural gas. A copy of the sample is provided as Attachment 114. As stated in Vol. 1, Section 2.0 of Chapter II (page 6), the natural gas processed in the Malvinas NGL Plant is filtered, dry with propane, butane, naphtha and heavier

components removed. No measurable sulfur compounds are present at this time in the lean processed feedgas provided to the LNG Plant.

Liquefaction Plant

115. Indicate the environmental management for: Removal of Acid Gas (Carbon Dioxide); Storage of Refrigerants.

Response 115

Removal of Acid Gas

The carbon dioxide will be removed by the aMDEA process will be vented directly to the atmosphere from the top of the Acid Gas Absorber. Carbon dioxide is a non-pollutant required for flora growth. Each human's exhalation is composed of carbon dioxide and water vapor. The carbon dioxide that will be vented to is estimated to be on the order of 90 metric tons per day based on the recent well sampling tests of 0.25 Mol% carbon dioxide from the San Martin 1004 well test sample.

The removal of carbon dioxide in the Acid Gas Removal Unit is a design feature of this unit that includes a technology licensed by BASF for the removal of carbon dioxide and hydrogen sulfide from the natural gas using activated methyl diethanolamine. As described in Vol. 1, Section 2.1.7 of Chapter II, refrigerants used at the Plant will be imported and will be stored in properly dedicated designed bullet vessels. These vessels will be located in an area of the plant designed with fire and safety protection systems described in Section 2.3.7 (pages 27-32).

Refrigerant Storage

As described in Vol. 1, Section 2.1.7 of Chapter II, refrigerants used at the Plant will be imported and will be stored in properly dedicated designed bullet vessels. These vessels will be located in an area of the plant designed with fire and safety protection systems described in Section 2.3.7 (pages 27-32). Only nitrogen, propane and ethylene will be stored as refrigerants on site. Methane and ethane, refrigerant, will be made-up from the feedgas to the LNG plant. Non-combustible nitrogen will be stored as a liquid in a high-pressure vessel for use as a refrigerant make-up or for purging of equipment and piping as needed for start-up purposes. As the atmosphere is composed of 21% nitrogen the small incremental volumes from any leakage have no environmental effect.

The ethylene for refrigerant make-up will be shipped to Peru using routine container-type liner services into commercial ports and transported to the LNG plant site by truck via the Pan American Highway in ISO vacuum-insulated containers under limited pressure to maintain the ethylene in a liquid state. At the site, the ethylene will be transferred from the container to the storage area in one of two bullet vessels. As a new ethylene container is brought in it will be exchanged with an empty container and returned to the supplier in Houston, Texas, U.S.A.

Propane refrigerant make-up will be trucked in from the Camisea Fractionation Facility located at Playa Loberia south of Pisco via the Pan American Highway. The propane will be transferred from the truck container into the pressurized bullets in the storage area. The ethylene and propane storage bullets will be located together in a refrigerant

storage and loading area. Also see Observation 34. The storage bullets will have a containment dyke graded at a slope toward a sump area where any leak accumulation can be monitored by LEL (lower explosive limit) detectors and controlled as per NFPA 59A. Fire monitors and hydrants are provided around the Class I, Division II Groups C & D area as per hazardous material NFPA safety requirements. Both the ethylene and propane bullets will have pressure control valves to relieve excess pressure to the dry flare system to prevent over filling of the bullets. Each bullet also has redundant pressure safety relief valves that relieve to the dry flare system for individual bullet protection.

Gas Feed Receiving Unit

116. As a safety measure, the Gas Feed Receiving Unit will be designed to separate and store all the liquid that may have remained in the gas supply pipe after the initial hydrostatic tests of the operation or which may have formed due to any irregularity in the upstream operations (Production Facilities of the Camisea Block at Malvinas) and pipe clean-up operations. The feed gas will flow through an Incoming Pressure Reducing Tank to remove any free liquid that may be accumulated in the pipe. The liquids removed from the Incoming Pressure Reducing Tank will be sent to the Residual Collector Tank, where the vapors will be led to the flaring and venting system and the liquid phase will be sent to the Hydrocarbon Waste Tank to be recycled or disposed of outside the facilities. At this point it is necessary to indicate that the venting of methane is one of the main gases that produce the greenhouse effect and, for this reason, for the venting and flaring thereof the type, volumes and permissible limits for these emissions must be established. With regard to the liquids, a detailed description must be made of where they will be disposed of, since at this point it is indicated that they cannot be disposed of outside the facilities.

Response 116

The feedgas is comprised principally of methane gas and is maintained within the facility during normal operation through the liquefaction process, storage and ship delivery. Methane gas will not be vented to the atmosphere as part of normal operations. Flare systems are provided for upset conditions such as over-pressure, emergency shutdown, etc. For further information regarding flare emissions please see Response 38. Atmospheric pressure relief valves are provided as a "last resort" safety system in the unlikely event that other redundant safety systems fail and would only be used for a very short interval to return the system to a safe working condition. This back-up design is the same as for the gas pipeline that is transporting the gas from the Camisea Region over the Andes Mountains to the coast and northward to the city gate facility at Lurin. As regards the liquid hydrocarbon, the incinerator on site or an approved offsite handling facility will be used to properly dispose of any liquid hydrocarbon.

Gas Treatment

117. Specify how the aMDEA Wastes of sweet gas will be managed.

Response 117

One of the primary reasons that aMDEA was selected for this process is the absence of waste generation. Activated methyl diethanol amine (aMDEA), is a tertiary amine that will be used to lower the CO₂ in the feed gas from 0.57 mol% to 50 ppm. Other than CO₂, there are no wastes associated with the carbon dioxide removal process. Lowering the pressure and heating the solution releases the absorbed carbon dioxide and prepares the solution to be pumped back to the absorber column for more carbon dioxide absorption. The word "Activated" means that it contains a small amount of catalyst or synergist that allows the aMDEA to achieve the removal of CO₂ to the desired levels. Activated MDEA is biodegradable. The CO₂ removal occurs in an Acid Gas Removal Unit (AGRU). A simplified description of the AGRU operation is as follows: The CO₂ is removed in the AGRU operating in closed loop. Regenerated aMDEA will remove the CO₂ from the natural gas feed in an absorption column. The absorbed CO₂ will be removed in a regeneration column. The Amine then returns to the absorption column for absorption of CO₂. Heat added to the reboiler of the regeneration column will be the driving energy needed for the removal of CO₂. No degradation of the amine is anticipated as the operating temperature is well below the degradation temperature.

118. There will be an activated carbon absorber in place as safety measure. The Activated Carbon Absorber will remove any heavy metal present in the feed gas. Used activated carbon filters impregnated with sulfur will be returned to the supplier for regeneration and/or disposal. The waste generator is responsible until securing the environmentally approved final disposal of the wastes (in this case, the filters); therefore, it must make sure what the final destination thereof will be.

Response 118

A spare charge of 75 m³ of sulfur-impregnated activated carbon bagged extruded pellets size 4x10 mesh will be stored on site in self-handling bags. When the Activated Carbon Adsorber requires recharging, (no less than every three years) the spent material will be removed, bagged and shipped back to the supplier, Norit Americas Inc., for regeneration in their approved facility near the city of Pryor, Oklahoma, U.S.A. The local distribution company in Peru is Reinoll S.R.L. located on Avenue Petit Thouras 3841, Office 101 in San Isidro – Peru Lima 27. PLNG acknowledges that they are ultimately responsible for the proper disposal of any waste removed from the plant facility. As part of the overall EMP, PLNG will only engage with transportation and disposal contractors who are licensed and approved by PLNG and the proper Peruvian regulatory agencies. PLNG will require verification of final disposition through the use of manifest forms that track the waste disposal from origination to final disposition.

Scope of the Project

119. In the introduction it is stated: "consists of a strip that has been technically established for engineering and environmental impact assessments of 3 km and approximately 700 km long. Clarify whether the 3 km refer to the length of the strip or if the assessments will be made in a 3 km-area?"

Response 119

The EIA will encompass:

1) The Project Area will be situated on a 521 hectare arid coastal site at Pampa Melchorita, located between the 167 to 170 kilometer (km) markers south of Lima on the west side of the Panamericana Sur Highway in the district of San Vicente de Cañete, province of Cañete, department of Lima. Additionally it will include a marine reserve area of three (3) by three (3) kilometers adjacent to the project site and a marine disposal area of two by two kilometers approximately eight kilometers west of the site. For the marine studies Monitoreo Ambiental e Investigacion de Impactos S.A. considered a study area that extended 10 kilometers west of the coastline for the marine facilities and dredging disposal area. Please see Figure 3 of the EIA Executive Summary. The actual boundaries of the Project site are presented in Figure 1 of Chapter II.

2) The direct area of influence for the physical, biological, and cultural features of the project study area comprises: baseline studies for characterization of social and environmental features of the project study area comprising an area eight kilometers wide of which five kilometers is inland and three kilometers offshore from the coast of the Pampa Melchorita site and approximately 27 kilometers long that runs from the Canete River north of the site to the Topara Creek south of the site. Please see Figure 3 of the EIA Executive Summary. This area of influence covers approximately 216 square kilometers.

3) The indirect area of influence also shown in Figure 3 of the EIA Executive Summary includes the Departments of Lima and Ica and their respective Provinces.

Project Details

120. It is important to include the following information:

Responses 120

Most of this data is included in the EIA or in the clarifications provided in these responses, which are referenced in the items following:

a) Type and quantity of machinery

Response 120a

A description of the permanent equipment that will be part of the operating plant are included in Chapter II section 2 of the EIA. The type and quantity of equipment that contractors will use during construction can vary widely dependant on the contractors work methods and subcontracting philosophies. The type and numbers of equipment on site will vary throughout the project depending upon the type of work underway at any given time. A representative summary of major construction machinery expected to be used by subcontractors is provided in Attachment 120a should serve as a good guide. This summary estimates the peak requirements for the various types of equipment.

b) Type and quantity of transportation

Response 120b

a) An estimate of the materials and equipment to be transported to the site is described in Response 20.

c) Type and volume of fuel

Response 120c

The fuels used during construction are roughly estimated to be between 30,000 and 40,000 cubic meters. These quantities include quantities of fuel mentioned in Responses 33 and 108.

d) Number of workers

Response 120d

Approximately 3,000 workers will work on the site during construction and around 150 during normal operations. This is described in further detail in Responses 39.1 and 40.1.

e) Materials and consumables to be use by the project

Response 120e

A list of raw materials is provided in Vol. 1, Section 3.4 of Chapter II for construction. A list process of products is provided at Vol. 1, Section 4.6 of Chapter II. A listing of consumables used during plant operation is included in Response 34.

f) Characteristics of these materials in order to determine contamination risks (type of welding, lining, x-rays taken, among others).

Response 120f

The list of chemicals anticipated that will be required to support the operation of the LNG Plant is included in Vol. 1, Section 4.6 of Chapter II, page 47. A list of raw materials is provided in Vol. 1, Section 3.4 of Chapter II. Also, at Chapter V section 4.2.1.4 Table 3 a list with classification of liquid and solid wastes to be produced during construction stage and at section 4.2.2.4 Table 4 a list with classification of liquid and solid wastes to be produced during operations stage, are provided. Chapter V modules MR-1, MR-2, RO-1 and RO-2 provide the environmental management of waste products (liquids and solids) during construction and operations stage respectively.

g) Location of borrow areas and dumps or spoil dumps

Response 120g

Borrow areas for earth fill and spoil dump areas will be maintained within the site boundaries. See Response 19.1 for further details. Aggregate and crushed sand for concrete making and road building will be purchased locally as described in Response 19.2.

h) Volume of earth to be moved in cut and fill task

Response 120h

The volumes of soil to be excavated to prepare the site is estimated to be 6,200,000 m³. Some of this material will be used for structural fill and the balance disposed of on the site as indicated in Response 19.1.

i) Complete list of thematic maps to be included

Response 120i

A list of thematical figures and maps is provided in each individual section of Chapter III, Volume 1

j) Indicate in a thematic map the sampling points for air, water and soil

Response 120j

Thematic maps of sampling air, water and soil points are provided at section 4 of Chapter III (Maps EQ-01 and EQ-02). Also, thematic maps for monitoring points are provided at Volume 1, Chapter V; during construction stage see Figures SM-2.1 (water), SM-5.1 (sediments), SM-6.1 (marine environment), for air and noise see Module SM-3 and SM-4. For monitoring stations during operations stage see maps at Figures SO-2.2 (water), SO-3.1 (sediments), SO-4.1 (marine environment), for air and noise see Module SO-5 and SO-6 in combination with a map provided at Volume 1 Chapter III (Map EQ-01 of Section 4).

k) It is necessary to indicate that this EIA is for research purposes and previous assessments made by other institutions should not necessarily be resorted to. It is important to make own analyses.

Response 120k

This EIA is a compilation document of research and analysis provided by Golder as a primary consultant and other consultants such as KBR, INSPECTRA, and SEHIDRO. Physical measurements have been made to provide a clear baseline record of data for analysis and design purposes. A very extensive amount of data collection and analysis was performed by consultants contracted by Peru LNG to support of the preparation of the EIA. These work included land geotechnical analysis (Golder), marine geotechnical analysis (MRA), offshore geophysical and marine hazard surveys (Golder), seismic hazard analysis (MMI), Tsunami hazard analysis (University of Southern California), ocean meteorological measurements and analysis (Fugro Geos), historical sea conditions (Ocean Weather Inc.), land transportation analysis (Cesaro), marine design (Sandwell), physical wave modeling of breakwater and berth system (Canadian Hydraulic Center), oil spill dispersion studies (CSD Research), oil spill response plans (Counterspil Research), ship maneuvering studies (Smit) and others. Golder prepared the main document Volume 1, while Volume 2 contains support data provided by Golder and the other consultants.

INRENA'S OBSERVATIONS

121. Include an analysis of the impact on the change of the soil use considering that this area was intended for irrigation purposes and the expansion of the farmland.

Response 121

The use of the selected site for the LNG Export Project and the loss of the site as a potential agricultural area were considered in the EIA. The selection of the site for the development of the LNG Export Project considered many parameters as described in Section 1.7 of Chapter II of the EIA. All of these selection parameters were evaluated

simultaneously to select a site that met the siting conditions while minimizing the environmental impacts.

The property where the proposed LNG Export Plant is expected to be built requires 521.0012 ha. The potential use of the site for agricultural expansion is very marginal. Only part of the total area to be used for the construction of the Liquefaction Plant (339.9949 ha. of Real Estate Unit N° 90482) formed part of the El Platanal irrigation project located at Pampas de Con Cón - Topará.

- By means of Supreme Resolution N° 026-2002-AG dated October 16, 2002, the aforesaid plot of land (339.9949 ha.) was excluded and made independent of the 22 499.93 ha. of untitled land that are freely available to the State and are included in the private investment promotion process (El Platanal Project). The Supreme Resolution referred to above was approved by the President of the Republic and the Minister of Agriculture.
- According to studies conducted in relation to the area and the internal and external effects of the Plant, it has been concluded that the private investment promotion area will not be impacted by the change in the use of the soil.

We are attaching the following documents in support of this answer:

1. Registration Card of Land Register Unit 90482*
2. Registration Card of Land Register Unit 90483*
3. Registration Card of Land Register S/N*

*Included as Attachments to Responses 1a and 95.

Said documents prove that:

- a. The first registration of ownership of Land Register Unit S/N was made in favor of the Peruvian State, represented by the SBN.
- b. Land Register Units 90482 and 90483 originally belonged to the Ministry of Agriculture.
- c. Land Register Unit 90483 was excluded from the private investment promotion process, by means of a Supreme Decree.
- d. Land Register Units 90482 and 90483 were transferred for no valuable consideration whatsoever by the Ministry of Agriculture to the State, represented by the SBN.
- e. At present, all three Land Register Units, which comprise 521.0012 ha., belong to the Peruvian State.
- f. The soils at the selected site are characterized as being highly susceptible to wind erosion as well as being dry most of the year due to the arid nature of the area. The on-site soils are further characterized in Chapter 3, Maps PE-06 and Table 2-3, as soils having a low agricultural value for lack of water, high salt content and a high potential for erosion. The lack of sufficient precipitation (50 mm per year) in the area and the lack accessible water from the nearest rivers: the Cañete River located 15 km northwest and the Topara Creek located 12 km southeast deemed the loss of agricultural land use as a very low impact.

122. Specify in greater detail the maintenance to be made to the slopes that support the plant facilities (indicating the actions) that will be above sea level (for example, the storage tanks).

Response 122

The cliff will be reshaped in the area where facilities are installed. A slope will be established that can be maintained under all conditions. The material and shape of the natural slopes were investigated in detail during the geotechnical boring, sampling, testing and seismic work conducted in 2002. Golder and Associates provided recommendations that were used in designing the arrangement and layout for the equipment. These recommendations are reflected in the basic design for facilities around the slope in the following way: a) Equipment is located at a safe distance back from the cliff edge to avoid any risk from a slope failure and b) where pipes or cables cross the slope between the plant and the marine jetty, the slope will be graded to a flatter angle. The basic design shows the LNG storage set back from natural edge of the slope by 120 meters (providing a calculated slope from the nearest seaward point of the tank to the base of the slope of less than 22%). For the pipe and cables, they will be installed on the surface of a reshaped slope with an average slope of less than 28%. Golder and Associates was asked to check these arrangements and has provided an analysis of this application and a comparison to failures of slopes in similar alluvial soil conditions in Peru and Chile. Please refer to Attachment 122 for additional detail.

123. Make a correlation between the metals identified and quantified in the sediments, and the species of the benthos that are deemed to be more susceptible to their effect or accumulation (mainly arsenic, cadmium and chromium), and which may serve as indicators for a marine biological monitoring considering that the construction activities (dredging) will remove the sediments. This is action could increase the bioavailability of metals in the marine environment in both the water column and the seabed.

Response 123

As indicated in Section 4 of Chapter III of the EIA, the concentration of arsenic, cadmium and chromium encountered during the EIA represent natural levels of metals found in the soils of the site. The concentrations of these parameters found in the soils and seabed sediments of project area are presented in the tables included on page 4-13 for metals found on soils and page 4-22 for values of arsenic found in sediments). The arsenic concentrations were within the range that has been previously recorded in Peruvian coastal soils. Cadmium and chromium were found during baseline sediment monitoring at lower concentrations with respect to the corresponding international criteria values of 22 mg/kg (for cadmium) and 87 mg/kg (chromium) (see page 4-22 for discussion on sediment concentrations encountered). Cadmium and chromium levels were found to be well below the international sediment criteria. The lack of sources of potential contamination in the area further reinforce that these metals encountered represent natural background levels of metals found in the environment. As such species in the area are already adapted to these levels of metals.

During dredging activities, turbidity will be minimized to reduce effects on surrounding areas. Turbidity will be controlled by means of the dredging equipment specified for this project (suction dredge), the management procedures proposed such as reducing the speed of dredging including the temporary stoppage of dredging activities until turbidity

levels resume to background levels at the edge of the mixing zone, and daily monitoring of turbidity at the boundaries of work area. Other monitoring activities such as water quality and marine sediment analysis and ecosystem will be conducted during construction stage to build upon the baseline data established during EIA. The monitoring will be conducted during the same seasons and at the same transect lines as indicated on Modules SM-2, SM-5, SM-6 of Chapter V.

124. Indicate the procedure to determine the significance of the meteorological information applicable to the project area, on the basis of the information provided by the meteorological stations of Pisco and Lima.

Response 124

We have one year of data from the PLNG weather station on site. This data compares very favorably with the Pisco data. We plan to use the site data as the key reference data for plant design input.

The main purpose of collecting climatologic information is for the purpose of conducting air dispersion modeling at the site to evaluate the ambient air quality impacts of the project. Although, meteorological information is being collected at the site, this information was limited for use in the dispersion models and therefore data from the Pisco airport located 50 km from the project site and the Lima airport located 160 km from the site were used. As described in Section 4.1.1 (page 23) of Chapter IV, the Pisco information was also limited and ultimately the Lima station was used because it reported the required data necessary for modeling with 97 percent of the data observations recorded. The data collected and used in conducting the air dispersion model was sufficiently complete and representative of regional weather to conduct air dispersion modeling to evaluate the ambient air quality impacts.

125. It is indicated that an inverse osmosis unit will be used to produce the plant's fresh water requirements. This will generate a continuous purge current of approximately 65 m³/h of brine, which will be sent to the discharge pipeline of the treated effluent. In this respect, an analysis indicating the components of the brine and whether the quality of the treatment of wastewaters shall be altered should be included.

Response 125

The reverse osmosis unit will produce concentrated seawater. Average inlet concentration of the seawater will be 36,000 TDS (total dissolved solids) and average outlet concentration will be 56,000 TDS. Surface runoff will consist mainly of equipment wash down (fresh water) and fire training exercises (fresh water). Surface runoff due to annual rainfall is very limited (less than 50mm average). Surface runoff will be passed through an API separator to remove any oily contamination. Any water produced by the plant process will be passed through a CPI separator and then through the API separator before discharge. Any oily waste collected will be trucked to an approved offsite disposal facility or burned in the facility incinerator. The concentrated seawater will be diluted to 0.10 ppt (36100 TDS) within 100 Meters from the point of discharge. Please see Vol. 1, Chapter V pages 133 and 139 for a description of the effluent treating and monitoring. See Attachment 50 for further detail.

126. A description should be provided of the distinct treatments of the contact and non- contact wastewater indicating the discharge point of the treated effluents. In this connection, the company should warrant that the receiving body (the sea) does not change its present conditions, and rather improve, if at all possible.

Response 126

The treated sewage effluent will be used for site irrigation. Sewage treatment tank overflow to the effluent will be deleted and will not be in the final design. Any surface water runoff will be passed through an API separator to remove any oily contamination. Surface water runoff will consist mainly of water used for fire training (fresh water) or equipment washing as the annual rainfall is very limited (less than 50 mm per year). Most of the plant process water produced will be reused as make up water for the amine system (acid gas removal). Any water produced by the plant process and not used as amine system make up will be passed through a CPI separator and then through the API separator to remove any entrained hydrocarbons. Any oily waste will be collected in a tank and trucked to an offsite disposal facility. Please see Vol. 1, Chapter V page 133 and page 139 for a description of the effluent treating and monitoring.

127. Specify the technical characteristics of the incinerator for the solid, and the non-recyclable liquid wastes, including the characteristics of the main emissions that it will bring off, and the mitigation measures to avoid an infringement of the environmental air quality standards.

Response 127

The technical specifications of a typical incinerator are presented in Attachment 83.4. The incinerator incorporated in the design provides PLNG with an alternative to the disposal of solids and used fuels in the case that a local recycling company is not available for proper disposal. The EIA indicates under Section 2.3.11.7 of Chapter II indicates the design capacity of an on-site incinerator as capable of processing 4,800 kilograms per day of solids or 2,400 kilograms per day used oil. Although the incinerator is capable of combusting the design capacity, the actual operating hours of the incinerator and thus the actual quantities that will be incinerated will actually be less than the design capacity. The incinerator is proposed to operate during intermittent periods and the generally no more than 1000 hours per year. At this level the incinerator will emit pollutants such as PM and SO₂ in the order of less than 5 tons per year with insignificant ambient air quality impacts.

128. Indicate the topsoil existing in the project area, including the percentage of the area that will be disturbed, and the recovery measures that will be implemented after the construction period.

Response 128

The vegetation coverage of the Project site is very scarce with only small areas containing Tillandsia fields and lichens in the southeast side of the site. Section 3.1.1 of Chapter III and Chapter IV of the EIA indicates that the Tillandsia fields consist of bromeliads and covers an area of approximately 2,500 square meters which represents less than one-half of one percent of the plant area). Prior to the earthwork operations, management measures will be implemented that include excavating portions of the

Tillandsia fields and moving these plants to a nursery area for storage and propagation until the completion of construction. After construction, these plants will be replanted in selected locations of the project site and incorporated in the overall landscape plan for the project site. A management measure to protect and recover the cover of the endemic species is provided at Chapter V Module AC-4. Page 69.

129. Include a detailed description of the life zones, soil classification, and potential use of the land in the service area of the project including a georeferential map.

Response 129

According to the ecological map of Peru (ONERN, 1996) the facility area is in the life zone called "Dry Subtropical Desert" (Desierto Desecado subtropical). It has an annual precipitation ranging from 15 to 31mm corresponding to the condensation of the coastal fogs and a temperature ranging from 13 to 28 degrees centigrade. Soil types are classified and characterized in accordance to the USDA soil taxonomy criteria by order, sub-order, major group and sub-group as well as the common name.

Soil classification and potential use including maps are provided at Section 2 of Chapter III (pages 2-7 and 2-8). Life zones are described at Section 3 of Chapter III (page 3-1). Section 2 of Chapter III of the EIA presents several maps that describe the soils present at the site (Figure PE-04) and the potential use for these soils (Figure PE-06). Furthermore the regional and local characteristics of the soils are documented in Section 2.3.1. The soil classifications for the region and the site are further classified by geologic deposition (Table 2-1) and by the capacity of these soils for use (Table 2-3). Figure PE-04 describes the various soil types present at the site. These soil types are classified and characterized in accordance to the USDA soil taxonomy criteria by order, sub-order, major group and sub-group as well as the common name. Two main soil types encountered at the site by Order are Entisols and Aridisols or commonly known as Lomadas and Melchorita. The Lomadas and Melchorita were further subdivide and classified based on the grade, salinity and drainage and quantified by the amount of hectares present on-site and the overall percentage of coverage of site area. Figure PE-06 provides the capacity of the soils encountered at the site by Group, Class and Sub-Class. Five different groups of soils have been identified on-site ranging as soils suitable for cultivation, for pasture, forest and protected areas. These soils are also subdivided by either a medium or low agricultural value and by limiting factors for the various uses of the soil. In summary, 85.7 percent of the soils present at the Project site are classified as having low agricultural value and restricted in use due to the soil type, salinity and drainage.

130. Indicate in the soil map the location of the five test pits made describing the modal profile of the soil groups included in the study.

Response 130

Test pits locations are depicted at Map EQ-1 of Vol. 1, Chapter III, section 4 and soil profiles, picture and laboratory analysis are provided in the first section of Appendix 2.

131. Indicate how the marine structures would be maintained, considering that they shall constitute a substratum for the growth of marine organisms, such as algae and small shellfish, which will bring sea birds to the area. These are major aspects that should be considered to meet the life span of the project.

Response 131

All marine structures will be properly maintained and regularly inspected to insure integrity of the structures throughout the life of the project. Cathodic protection will be installed to minimize corrosion. High performance anti-corrosion coatings will be applied and maintained. Pneumatic fendering will be installed to prevent incidental damage from berthing tankers.

132. Describe the physical stabilization measures of the berth, and the materials that will be used in its construction, indicating their permanence in time, and the environmental impact that they could produce if incorporated to the seabed.

Response 132

The jetty structure will be constructed of steel pilings with corrosion resistant coatings. A piled structure of this type will have in excess of a 30-year life span with good inspection procedures and minimal remedial maintenance. Impacts to the marine ecosystem during construction and operational phases of the project are described in Chapter IV pages 44-48.

The environmental impact of the breakwater and navigational channel after the completion of construction is described in Vol. 1, Chapter IV (pages 49 and 50, introduction of a new habitat type (rocks) and habitat re-colonization). The construction of a breakwater using rocky type material will create a new habitat where species, which adapt to this environment, will encounter ideal conditions for growth and reproduction. The EIA describes a certain species of clam in a larva state that are typically found in a rocky substrate, which implies a certain level of pioneer species that will result in the ecological succession of other species at the breakwater. A review of the technical literature indicates a high level of stratification exists along the rocky coastline of Peru, with the dominant species being *Semimitylus algosus*, which create favorable conditions for a variety of tubeworms and crabs to exist in the supralittoral. Incrustants are the most abundant species that would colonize the breakwater. The presence of the rocky conditions provides a favorable habitat for the above-mentioned species, and therefore, the ecological conditions beyond the breakwater will remain unaffected. No technical references or benthic species were encountered during the study that are endemic to sandy substrate and therefore the construction of the breakwater will effect a very limited population of the benthic community.

133. It has been indicated that the breakwater will operate as an "artificial island" built with natural rock imported from coastal area quarries. The requirement is estimated in approximately 1,200,000 m³ of rock. Indicate the place or places from where the rock for the breakwater will be brought.

Response 133

The site for a quarry remains to be selected. The final location will be included in a separate EIA for that work. There are numerous potential sites along the coast. Several sites are under consideration. Three possible quarries that could supply the material required to build the jetty have already been located. A mining petition has been filed with the INACC, and the respective process (including registration with the Public Registry Office) is expected to be completed between January and June 2004. It should be stressed that none of the above quarries is located within the Paracas

National Reserve or its buffer zone. Furthermore, to develop said quarries, the company will file an EIA and will have it approved by the competent authorities. Also, see Responses 19.2, 78, and 100.

134. The area included between the internal part of the breakwater and the submerged rock of the wharf should be dredged, digging in the seabed an access channel that will allow the entrance and operation of the methane vessels. Such internal navigation channel will have a width of approximately 250m separating the wharf from the breakwater, a length of 2,700 m and a depth of -18 m. The dredge will stir and extract sediments in a volume of 3,000,000 m³ of sand-silty material. Therefore, the environmental control measures that will be implemented to control the dispersion of the sediment plume without affecting the marine service area of the project should be indicated.

Response 134

Please see related Responses 12, 44, 73, 76, 77, 80, 99, 104, 110, 123, 141, 142 and 178.

135. The study indicates the architectonic and structural characteristics of the breakwater, which will be supported on the sediment substratum. The studies should include the necessary calculations of the soil mechanics to ensure that the seabed will not give way due to the weight of the structure creating as an effect of the pressure a continuous current of suspended sediments that will alter the turbidity of the area.

Response 135

Between March and May of 2003, MR & Asociados S.A.C. completed an underwater geotechnical investigation at Melchorita. A total of nine boreholes were drilled. A loose layer of silty fine sand exists in the upper 0.60 meters, varying to dense silty fine sand to a depth of 5 meters (with respect to the sea bottom). Below this layer of silty sand the stratigraphic profile is comprised of very competent soils (i.e. clayey and sandy gravel). The breakwater body will consist of 2 to 8 ton rock fragments. It is estimated that the total settlement of the breakwater bottom may reach a maximum value of 2 to 4 meters. With respect to foundation bearing capacity, no conditions are envisioned which could negatively impact the breakwater foundation. Details of this foundation analysis is provided as an Attachment 135.

136. At a glance, the qualitative cause – effect of the modified Leopold type matrix with colorimetric or chromometric variable (Table 1 Page XXVII – Volume 1) that has been prepared, highlights that the negative are higher than the positive impacts. Quantitatively, in the 11 matrix charts, including 22 selected change indicators to which 7 qualification parameters have been applied, as a consequence clear and quantitative measures of a reversion of the strong impact (qualified as = 188.1 points) is not provided in the matrix of environmental impacts. Such comparison should be explained and clarified.

Response 136

All of these potential impacts will be modified or mitigated by the environmental management strategies as set out in the Environmental Management Plan (EMP) and

will monitored during the project and EMP implementation. Attachment 136a and 136b presents another type of analysis with matrixes prepared with and without EMP implementation as proposed on Chapter V.

Table 1 presented in the Executive Summary summarizes the information presented in Tables 6 (page 14 of Chapter IV) and 7 (page 15 of Chapter IV). These tables were generated based on the results of the environmental assessment conducted and described in Chapter IV and 22 matrices scoring environmental change indicators individually as presented in first part of Appendix 3. The intention of this qualitative/quantitative scoring exercise is to help the EIA team, Peru LNG Company and the reviewing agency to identify potential impacts derived from project activities at different stages and to define management strategies to prevent, control and mitigate those potential impacts derived during the execution of the project (see Chapter V EMP structuring tables 1 and 2 pages 18 to 21). The 22 environmental change indicators as individually scored represent physical, biotic and socio-economical environmental components, which are not designed to be combined into a single number for ranking purposes. The chromometric tables as explained in Table 5 of page 13 of Chapter V indicate that during the construction stage, the project will produce potentially positive economic impacts but slight to moderate impacts on the physical, biological and social components (see Table 6 on page 14). Each individual impact would have to be analyzed on attributes such as probability of occurrence (Po), Reversibility (R), Frequency (F), etc, and as all of these individual impact attributes will be modified by the environmental management strategies (see the Environmental Management Plan) and would be finally scored by the monitoring program during project and EMP implementation. Therefore an attempt to provide a single numeric number for evaluating a complex set of variables is not a mathematical formula that can be applied but rather a hypothesis developed during the EIA, which is tested during the monitoring of Project implementation strategies

137. Include data and results of studies made with measuring equipment, considering that only tables of tides for the Port of El Callao were used to identify the potential impacts on the direct and indirect service area of the project.

Response 137

PLNG has over one year of tide, wave and current data from metocean monitoring equipment installed at the site for detailed design input. The extreme range of the tides as recorded between June '02 and May '03 is 1.17 meters. The actual tide level elevations have been referenced to the national geodetic datum in Cerro Azul. A table included in a report prepared by Fugro GEOS is provided in Attachment 141a that shows an analysis of the tide levels found at the site.

138. According to the Environmental Base Line, the good primary productivity of the habitat and biodiversity conditions in the sea area that will be affected by the direct impact will determine, due to the bio-oceanographic characteristics, an anthropically little intervened area in both the water column and the benthos (seabed) serving as feeding area for larger species, and breeding grounds for larva and alevines (juvenile) of species, such as anchovies, silversides, silver weakfish (*sciaena deliciosa*) hair-tails, and larger benthonics, such as soles. In this connection, indicate the environmental control measures that will be implemented during the construction and operation of the project.

Response 138

A monitoring program has been designed to manage and minimize the environmental impacts and to establish an early detection system that will allow the modification of procedures to control impacts from going outside the project area. During the marine construction activities the impacts associated with dredging such as turbidity will be reduced and controlled by the use of a suction dredging technique; daily monitoring of turbidity levels in the surrounding work area and work practice standards such as reducing or temporarily stopping the dredging activities until the surrounding area returns to normal values. Potential oil spills or waste disposal will be managed and controlled in accordance with the Modules provided in the EIA. Any changes produced on the environment by construction activities will be detected during the sediment monitoring and marine ecosystem monitoring. The monitoring program is designed to maintain and control impacts to a minimum area, to detect the potential impacts using an early detection system, and to continually evaluate and modify procedures as needed to control impacts. During operations of the plant, any maintenance activity in the marine environment will be controlled by procedures established by Module AO-2 (Actividades de Mantenimiento) and any changes in the water, sediment or marine ecosystem will be detected by the monitoring procedures set at Modules SO-2, SO-3, SO-4 and SO-7. For additional information please see Modules AC-8 (Actividades de Construcción Marinas), MR-1 (Manejo de Residuos Liquidos) and MR-2 (Manejo de Residuos Solidos), Module SM-2 (Monitoreo de la Calidad del Agua) and Module SM-5.

139. The contingency plans shown and prepared for the Environmental Impact Assessment have been based on general provisions, without taking into consideration the possibility of modeled catastrophes and maneuvers. Therefore, they should be prepared describing in detail applying specific environmental management measures integrated with all the project activities. (For example, the Environmental Impact Assessment plans in Volume I differ from those included in the Environmental Impact Study in Exhibit 6).

Response 139

Peru LNG has conducted additional studies to further review the oil spill contingency plan included in the original EIA submission. The detailed Oil Spill Response Report is provided in Attachment 180. Exhibit 6 is the specific section of the EIA that applies to marine facilities. Changes that are being made to the oil spill contingency plan and emergency spill response equipment inventories will apply to Exhibit 6.

140. As the studies suggest, the area that will be affected by the direct impact of the construction and operation of the maritime terminal is the component of a coastal oceanic cell with a service area extending between the Paracas Peninsula to the south, the Centinela Point in Cerro Azul to the north, and the Chincha Islands to the southeast (including the San Gallán, Ballestas and Blanca Islands). The consistent presence of cold waters is also an indicator of the proximity of outcropping areas across from Pisco. Although in some parts of the study, the specialists refer to this oceanographic micro-area phenomenon, in the interpretations and results of the investigations, the information has not been integrated, and is only related to general oceanographic and ecological phenomena that occur all along the Peruvian coast.

Response 140

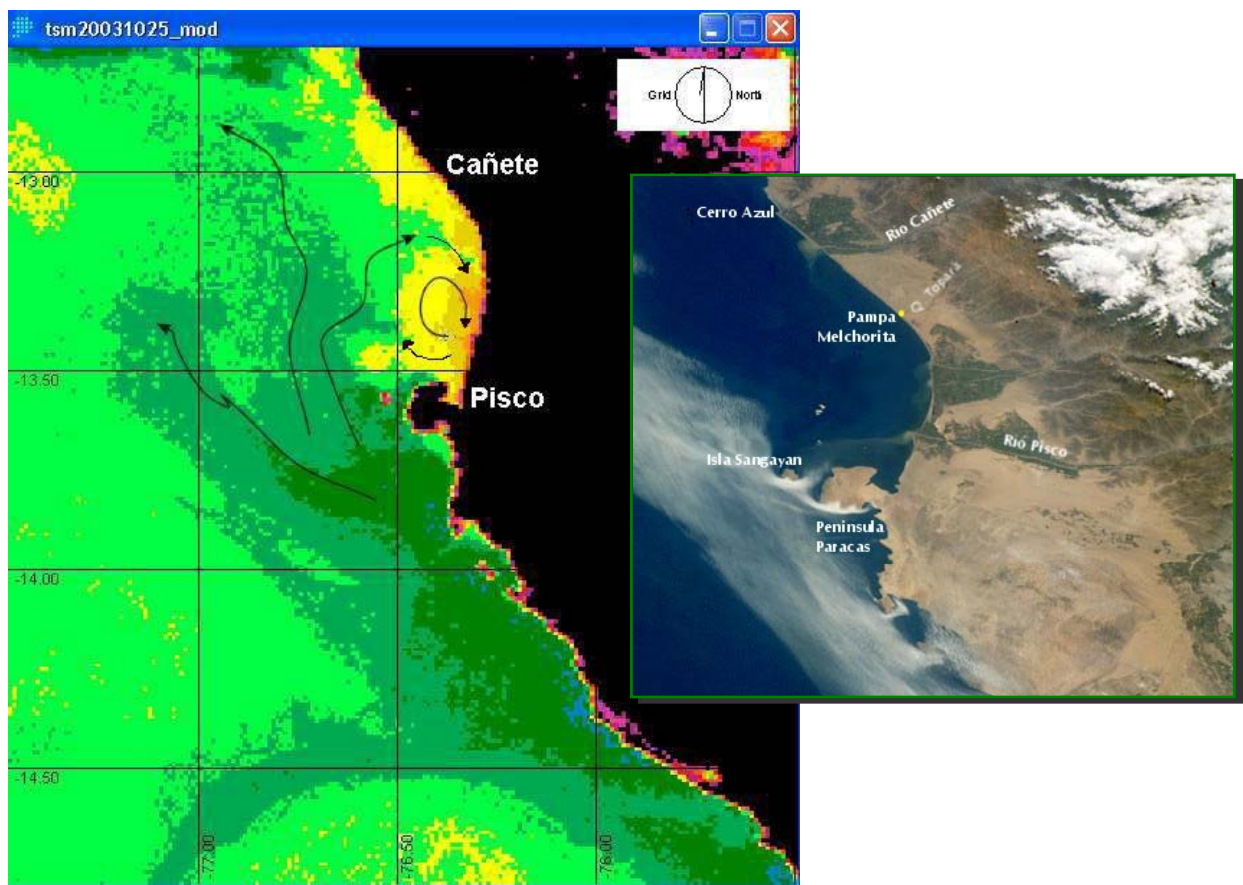
An oceanic cell is defined as an area consisting of approximately 100 km by 100 km. An oceanic cell is used to conduct meso-scale oceanographic studies where all processes that occur within the cell that include the surface and water column are investigated and clearly understood. A distinct oceanic cell is identified by having a distinct water column inter-face between two oceanic layers (thermocline or pycnocline), which originate strong water mass movements within the water column. Baseline information gathered for evaluating impacts for the EIA consists of both macro (indirect area of influence) and micro (direct area of influence). This project was analyzed consistent with established EIA practices.

In evaluating the impacts related to the project, the overall movement of water mass and currents were investigated which consisted of several oceanic cells that encompass many oceanic cells which move water in a counterclockwise direction along the South American coastline from the just north of the South Pole towards the equator and across the Pacific Ocean. Based on the EIA study, the overall movement of water is regionally affected by orientation of the coastline near the project site bounded by the peninsula of Paracas and Cañete that creates a unique circulation pattern as presented in the below-referenced figure. This pattern of circulation although located within a specific oceanic cell, is predominantly influenced by local conditions. In contrast, the movement of water beyond the direct area of influence i.e., 50 km west of the shoreline is predominantly influenced by the Humboldt Current, which generally flows towards the north.

The regional effects of the currents between Paracas and Cañete indicate that the circular pattern of currents within the indirect area of influence are unique to the much larger cells that extend beyond the project area. The aerial photograph presented below supports the counterclockwise circulation. A comparison of the discharge of sediments from both the Cañete and Pisco Rivers suggest that movement of sediments originating from the Cañete River tend to settle close to the mouth of the river while the Pisco River sediments tend to extend beyond the mouth of the river with a delta of sediments that trend slightly towards the south.

As demonstrated by the results of the baseline studies at the study area, no evidence of a thermocline or other oceanographic characteristics used to establish an oceanic cell in this area were identified. The study area is characterized by a coastal zone, which extends from the shoreline to a depth of 17 m. The construction/operation of marine structures are expected to influence the environment on a micro-level scale. As previously indicated, an oceanic cell is established to conduct a meso-scale type study while an EIA establishes the characteristics of the environment that will be influenced directly by a project. On a micro-scale level as previously indicated, the EIA sets out to define parameters that will be monitored to control or to protect the environment from potential impacts in the direct project area of influence and to reduce effects from extending beyond project area (indirect area of influence).

The presence of cold waters in the study area is influenced not only by the regional upwelling process that occurs along the southern coast of Perú; but, also by the coastal upwelling process that occurs locally (see figure attached below obtained from satellite processing and photograph shown at Chapter 3, section 2.6.1)



Observations made of the characteristics of the sea floor and shoreline of the study area, reflects the influence of the Cañete River. However, due to the circulation pattern in the project area the influence of the project on the mouth of the Cañete River is not anticipated.

The EIA study describes the variation in the direction and intensity of the currents at the various monitoring stations at the project site. This information was not extrapolated beyond the study area. The macro analysis of marine area indicates that the project area lies within an area of Peru recognized by its abundant ecosystem (see list of species), which is attributed mainly to the Peruvian Current or the Humboldt Current that flows from south to north during the whole year. Similarly as the area of Pisco is an area of upwelling of cold waters, the coastal area of the project has its own upwelling dynamics, reflected in the cold temperatures and the characteristics that were presented in the EIA (Section 3.2.2.2 of Chapter III of the EIA). Characteristics observed on the sea floor reflects the influence from the Cañete River along shoreline of Project area, but no influence from this marine environment is expected on the mouth of the Cañete River.

During the EIA the presence of anchovy and spawning areas near the coast were detected. The study area is permanently perforated by industrial fleets that extracts anchovies indiscriminately even during the middle of the spawning period. These fleets operate within the five-mile coastal zone that has been reserved for artesian fisherman. The coastal upwelling in the area is greatly influenced by the effect of the winds that originate from the south throughout most of the year. Therefore, although an ecological continuity exists among the marine areas of Pisco, Cerro Azul, Islands Chincha, etc.

and the project, the possible impacts to the marine environment would not occur south of the project, but rather to the north of the project.

141. Interpret in the studies of marine currents the "u" and "v" (horizontal and vertical) components, so that their mathematical integration can be included in a graph of the construction of the oceanic cell of the area, to determine their present and future influence.

Response 141

The current regime in the area of direct influence has been examined in detail using the field measurements taken at the breakwater location. Horizontal currents have been measured and recorded for a period of over one year. Measurements of current direction and speed were taken at one meter intervals through the majority of the water column levels between the seabottom and the surface every 10 minutes. A detailed study was conducted to identify the effect that the breakwater would have on the current regime in the area. A mathematic model was used to show the change in the current field caused by the breakwater based on various directions of travel ie parallel to the breakwater, perpendicular and at 45 degrees. The study was conducted at one current velocity being 100 cm/sec – this is much higher than any current expected but easily allows us to identify the area of influence from the perimeter of the breakwater for any current velocity of interest. The offset distance for any scenario can be calculated as a direct ratio of the current velocities times the offset distance.

Generally, the currents are relatively weak with velocities below 20 cm/sec for 94% of the time. For reference, the current speed for a 500-year return period is only 34 cm/sec and the maximum tidal affect is 8 cm/sec.

The following study results using a 100 cm/sec current speed, show an extreme zone of influence that can be reduced in size using any sample current speed that is of interest. Results of the three test conditions are summarized below:

A: The most frequent currents flowing towards the southeastern direction that is parallel to the orientation of the breakwater and the shoreline. In this most representative case, the currents remain undisturbed by the breakwater outside a zone that extends about two (2) breakwater widths around the perimeter of the breakwater. This means the currents will be modified within 100 meters of each end and 200 meters of each side of the breakwater. As the currents and the breakwater are both parallel to the shoreline (northwest to southeast orientation) this is predominant case and effect. For test cases where the currents are perpendicular to the breakwater (and shoreline) or at 45 degrees to breakwater, the zone affected is larger.

B: For the currents perpendicular to the shore, the undisturbed zone is estimated to be 800 meters from the breakwater.

C: For currents at 45 degrees to the breakwater, the undisturbed zone is estimated to be 200 meters from each end and 400 meters from each side. A detailed summary of the current velocities and direction is included in the metocean measurement report provided in Attachment 141a. A current modeling study to show the change in currents caused by the breakwater is included in Attachment 141b.

142. The oceanic cell of the area should be characterized to dispel that the re-suspension of sediments would increase the total ratio of suspended solids and/or turbidity, as a result of the dredge, and influence neighboring biotopes

(such as the Chincha Islands). These observations are also applicable to the management of the discharge areas of dredged sediments and ballast water taking areas.

Response 142

Management tools will be used to reduce and control the potential effects of turbidity outside of the working area. The following measures are to be implemented.

As indicated at the EIA Chapter II (page 42) and Chapter V datasheets (AC-8 “Actividades de construcción marinas”, AO-2 “Actividades de mantenimiento” and SM-2 “Monitoreo de la calidad del agua”) present the management tools that will be used to reduce and control the potential effects of turbidity outside of the working area, mainly caused by re-suspension of sediments during dredging activities. The following measures are to be implemented: The use of suction dredging method instead of other mechanical methods; the setting of monitoring stations at the surroundings of the working area and daily surveillance of turbidity levels; to activate control measures during dredging activities such as reducing the speed dredging or temporary stoppage of dredging activities until turbidity levels are below the 200 mg/L limit. The measures will be implemented to limit the potential turbidity effects within the working area and to minimize the turbidity to tolerable levels to sensitive species and biotopes.

A detailed model of the dispersion of dredge spoil material as it is dumped in the disposal area was set up. A separate current measurement program was conducted at the disposal site and mathematic models developed by the US Corps of Engineers was used to check dispersion of the spoil during the dumping operation and the stability of the spoil mounds over time – see Response 104 for details of this work.

In reference to the ballast water discharges, this activity will comply with MARPOL-IMO standards and Peruvian regulations, which require the discharge and reballast water outside of the 12 mile territorial water limits. For further information please see Chapter V datasheets AC-8 “Actividades de construcción marinas”, AO-2 “Actividades de mantenimiento”, SM-2 “Monitoreo de la calidad del agua” and data sheet AO-1 in chapter V and Chapter II page 17. Compliance with these standards and regulations are expected to reduce and control any detrimental effects on the marine environment.

Additional information regarding ballast requirements is included in Response 47.2

143. The studies do not show the potential effects of the discharge of seawater over saturated with salt from the desalinization plant, or the monitoring and corrective measures that will be implemented.

Response 143

Please see response 50, 125 and 179.

144. Updated data of the Pisco Station located within the service area of the Project should be used for meteorological studies.

Response 144

Please see Response 124.

145. In the monitoring proposals during the construction and operation periods no mention is made of the specific detail of each one with respect to the marine component. Likewise, no plan has been submitted of the special location of the transects and sampling points or the tempore-operation sequence.

Response 145

During construction phase seawater samples will be taken from 10 sample points at three different depths for a total of 30 sample points. Please see datasheet SM-2 for the exact coordinates of the proposed sample points. Physical, chemical and bacteriological samples will be analyzed every three months, turbidity will be sampled daily. During the Operational phase 10 sampling points have been designated for physical, chemical and bacteriological tests. A report including the results of the seawater sampling will be prepared. In the event that water quality deterioration is observed, the causes shall be determined and corrective measures shall be proposed. Monitoring procedures for the marine component including parameters, frequency and location of monitoring stations are provided at Chapter V as follows: For construction phase please see Modules SM-2 ("Monitoreo de la calidad del agua" at pages 93-101, monitoring stations are depicted at Figura SM-2.1), SM-5 ("Monitoreo de los sedimentos marinos" at pages 107-108, monitoring stations are depicted at Figura SM-5.1) and SM-6 ("Monitoreo del ecosistema marino" at pages 109-110, monitoring stations are depicted at Figura SM-6.1). For operation phase see Modules SO-2 ("Monitoreo de la calidad del agua" at pages 132-138, monitoring stations are depicted at Figura SO-2.2), SO-3 ("Monitoreo de los sedimentos marinos" at pages 139-140, monitoring stations are depicted at Figura SO-3.1), SO-4 ("Monitoreo del ecosistema marino" at pages 141-142, monitoring stations are depicted at Figura SO-4.1) and SO-7 ("Monitoreo de la linea de playa" at page 150).

146. Determine the measures that will be adopted to control the quality of the ballast water of the vessels transporting liquefied gas prior to their dumping into the Peruvian sea.

Response 146

Please see Responses 47.2 and 142.

147. Specify whether the vessels entering into the loading area would have some type of protection in their chassis against the growth of algae or other hydro-biologic organisms that may be introduced in the marine environment, and which should be considered among the impacts on the quality of the water and the exposed marine organisms.

Response 147

The LNG carriers visiting the Melchorita terminal will comply with the International Marine Organization (IMO) Convention of October 2001 to ban the use of organotin (TBT) in antifouling paints. TBT-based products was phased out by 1 January 2003 and the use of TBT-based products on hulls is to cease by 1 January 2008 when all hulls with TBT-based antifouling systems are to have the paint sealed or removed by abrasive blasting. Antifouling paints used on the new LNG carriers contracted for dedicated service from the Peru LNG terminal will be TBT-free. New generation types of organic antifouling coating systems will be utilized that will have a good environmental profile for efficiency, be effective on marine organisms and will degrade

quickly. It is expected that these organic antifouling agents will degrade by more than 50% in less than one hour. These systems are not expected to have any measurable impact on water quality and marine organisms.

OTHER INRENA OBSERVATIONS

148. It has been mentioned that all the water required for the operation of the plant and the needs of the personnel shall be processed from crude seawater. The sea will be the only source of water for the LNG plant. Therefore, consideration should be given in the environmental evaluation to the use of seawater (taking into account that sea water is included under the provisions of the Water Law), which requires the filing of an application to obtain the respective permit to use seawater that will produce specific benefits, especially as part of the plant process.

Response 148

We are aware of Law Decree N° 17752, known as the Water Law, provides that the water belongs to the State, which enjoys inalienable and non-prescriptible rights of ownership thereto. Moreover, it further provides that all persons, including the entities of the National Public Sector and Local Governments, require a permit, authorization or license, as the case may be, to use water, except for water used to meet basic needs. Although procedures do exist to obtain a permit for the use of surface and underground water, no procedure currently exists for the extraction of seawater. We have made inquiries with DIGESA, Peruvian Navy, INRENA, and Vice Ministry of Fisheries; please find below the answer given by different entities regarding this subject:

Answer given by the General Bureau of Harbor Masters' Offices and Coastguards.-

We talked to Dra. Arellano, who works for the Legal Office. She told us that all matters related to the Water Law are handled by DIGESA and that no water extraction payment is made to the Navy.

We talked to OM Durante, who works for the environmental area. He told us that a fee is charged for the installation of the pipeline, but not for the extraction of water.

The procedure is followed for the occupation of a given sea area by the pipeline to be used to extract sea water. This is why a fee is paid for the use of the sea area.

Steps taken:

PLNG began the procedure that was to be followed to obtain an aquatic concession over the sea area required to carry out the activities described in the EIA. This is why it currently holds a Sea Area Reserve, which was granted by means of Directorial Resolution N° 0609-2002/DCG, dated October 21, 2002, as extended by means of Directorial Resolution N° 0309-2003/DCG, dated April 24, 2003.

On October 2, 2003, an application was filed with the General Bureau of Harbormasters' Offices and Coastguards, asking for the granting of the aforesaid Aquatic Concession. This application is currently under way.

PERU LNG S.R.L. will be the titleholder of the Aquatic Concession by reason of the trade name change application filed on September 25, 2003.

*See Attachment 148a through h that contains the following documents:
Copy of the Peruvian Navy's TUPA, in force as of this date. This document proves that the procedure referred to above is not contemplated in the Navy's TUPA.
Copy of the documents related to the Aquatic Area Concession Application.

Answer given by the Vice Ministry of Fisheries

Dra. Marjorie Carbajal, who works for the Legal Office indicated that their TUPA does not include any procedure like the one described above, and that she is not aware of any procedure required to extract sea water.

*See Attachment 148 that contains: a copy of the Ministry of Production's TUPA, in force as of this date. This document proves that the procedure referred to above does not exist.

Answer given by DIGESA.-

DIGESA's Director of Water Protection, Eng. Walter Aliaga Pichilingüe, indicated that no permit is required to extract sea water. However, a permit is required to discharge water into the sea after the inverse osmosis process has been carried out.

Eng. Vidal, who works for DIGESA's Water Discharge Area indicated that no procedure exists for the extraction of sea water, but a procedure does exist for the discharge of sea water (procedure 89- TUPA Ministry of Health-DIGESA)

* See Attachment 148 that contains: a copy of the TUPA of the Ministry of Health (DIGESA), in force as of this date. This document proves that no such procedure exists.

Answer given by INRENA, Water Office, Technical Management Office in and for Cañete.-

Dr. Edwin Rojas, lawyer of the Water Office, indicated that no procedure exists for the extraction and use of sea water, and that the Water Office has jurisdiction over canals and rivers used for agricultural purposes, in view that water is a scarce resource.

A similar answer was given by Eng. Luis Yanpufe, Head of the Technical Management Office in and for Cañete.

* See annex that contains: Copy of the Ministry of Agriculture's TUPA, in force as of this date. This document proves that no such procedure exists. Copy of INRENA's TUPA, in force as of this date. This document provides that no such procedure exists.

Copy of the TUPA governing the Regional Agrarian Bureau in and for Lima and Callao (with jurisdiction over the area where the Project will be carried out). This document proves that no such procedure exists.

Copy of the Regulations governing the Organization and Functions of the Ministry of Agriculture, including modifying legislation.

149. Make sure that the contractor of the land and sea construction stage knows and implements the environmental control measures set forth in the Environmental Impact Assessment.

Response 149

We recognize that this is a Peru LNG responsibility. A compliance plan will be developed from the EIA and the contractor will be trained in the plan and control measures.

150. Include in the checklist the presence of archaeological resources in the project area, considering that this is an archaeological area and the place where the oldest man in Peru was discovered.

Response 150

Archaeological clearance (CIRA, evidencing the Non-Existence of Archaeological Remains over the Plant area) was obtained from the INC after conducting an archaeological evaluation of the project area and is presented in the last section of Appendix 2 (Certificate N° 2003-0001, issued by the National Institute of Culture (INC) by means of Official Letter N° 009-2003-INC/DGPA-D, dated January 15, 2003).

Without prejudice to the above, the company will employ an archaeologist, who will work during the earth removal stage, according to the guidelines established by the INC. If archaeological artifacts are found, the work in the affected area will be stopped and cordoned off with a protective barricade. The "Instituto Nacional de Cultura" shall be notified and steps will be taken to preserve the archaeological artifacts. Work will only recommence after the artifacts have been properly removed. The EMP at Chapter V addresses actions to be taken if remains are found during earthwork at Module AC-4 ("Preparación del Sitio")

DIGESA'S OBSERVATIONS

151. With regard to the operation of the incinerator, it has been stated that that used oils are incinerated. Specify what types of oils have been considered.

Response 151

Used lubricating oil will normally be recycled to an approved liquid recycler on a contractual basis. However, as a backup, it may be necessary to incinerate the lubricating oil on site in the incinerator. The incinerator will be approved to incinerate liquid waste for low emissions. The primary source of used lubricating oil will be from the large industrial gas turbines from General Electric MS7001EA. These turbines use synthetic lubricating oils such as Mobil DTE 724. Attachment 151 is a technical product and material safety data sheet for Mobil DTE 724.

152. The air quality results in the points where the maximum permissible limits established by the World Bank in PM-10 are exceeded.

Response 152

As per Chapter III, Section 4, a summary of air quality results is presented at Table 4-3, station AM-03 is the one exceeding PM-10 values set by World Bank. Field data as reported by ENVIROLAB is presented at Volume 2 Appendix 2. Location and coordinates of sampling points are indicated at Map EQ-01 and Table 4-1 in Chapter III, Section 4. The particulate matter is composed of very fine sand kicked up by wind and updrafts around the monitoring stations. This is prevalent for the area along the coastline where the very fine sand is suspended in air from winds or heavy fog. Dust control measures during construction and filter masks during these periods will prevent inhalation of excess particulate matter by workers.

153. In what areas will the effluents for irrigation purposes be used?

Response 153

A final landscaping plan has not been completed, however, due to the arid nature of the site and Peru LNG's desire to recycle water to the fullest extent possible, treated sanitary effluents will be collected for use in the overall landscape irrigation system. The treated sanitary effluent is of sufficient quality to be used as a source of irrigation water or to be disposed within applicable effluent standards; the applicant has chosen to utilize this wastewater as a resource. The final landscaping plan along with the final design of the LNG Plant and Marine Facilities will be performed by the design-built contractor and will be submitted to DGAA. Irrigation will most probably be used around the permanent community areas and plant administration offices to stabilize the soil and reduce particulate matter in the air as well as provide aesthetic appeal.

154. What type of plants will be irrigated?

Response 154

Please see Response 87.

155. Climatology assessments in the baseline are superficial. More in-depth assessments should have been made on a daily and hourly basis of important parameters such as temperature, relative humidity, solar radiation and winds.

Response 155

The main purpose of collecting climatologic information is for the purpose of conducting air dispersion modeling at the site to evaluate the ambient air quality impacts of the project. Although, meteorological information is being collected at the site, this information was limited for use in the dispersion models and therefore data from the Pisco airport located 50 km from the project site and the Lima airport located 160 km from the site were used. As described in Section 4.1.1 (page 23) of Chapter IV, the Pisco information was also limited and ultimately the Lima station was used because it reported the required data necessary for modeling with 97 percent of the data observations recorded. The data collected and used in conducting the air dispersion model was sufficiently complete and representative of regional weather to conduct air dispersion modeling to evaluate the ambient air quality impacts.

A weather station located on the site at Pampa Melchorita since April 2002 has recorded temperature, relative humidity, wind velocity and direction and precipitation. That data is provided as Attachment 155. The data reported in the EIA is from the Pisco and Callao ports which were used in the engineering design for the LNG plant.

The recorded weather data at Pampa Melchorita compared to the Pisco and Callao weather data indicate no precipitation and lower temperatures, humidity and wind. This indicates that the engineering design is conservative for the LNG plant.

156. Indicate whether a risk study has been made, taking into account the storage, handling or transportation of materials and/or hazardous substances.

Response 156

Risk studies have been conducted on the storage and handling of hazardous materials at the site as indicated in the thermal radiation modeling, vapor dispersion modeling, overblast protection modeling and the HAZAOP failure analysis. Transportation of these hazardous materials will be, by import at the Port of San Martin south of Pisco or from the Pisco Fractionation Plant currently under construction, north via the Pan American Highway to the Pampa Melchorita LNG plant site. Transportation will be done in accordance with Peruvian Regulations with the appropriate community notice and spill containment procedures in vehicles approved by the Ministry of Transportation.

157. Taking into account the magnitude of the construction and the frequency of activities in the sea, has any mathematical or hydraulic model been prepared for the study of the current lines and movement of sediments?

Response 157

Significant work has been ongoing in support our understanding of the conditions at the site and development of appropriate work methods and plans for implementation of the project. For example, currents and waves have been measured starting in April 2002 using Acoustic Doppler Current Profilers (ADCP) and a wave rider buoy to understand the wave and currents of marine environment in the area. Since June 2002, an ADCP has been installed at the 15-meter water depth at the project site. This ADCP is collecting current and wave data on an ongoing basis. Details of the currents and waves found during the first year of deployment at the project site are described and reported in Response 141a.

A detailed study was conducted to model and estimate the change in current patterns caused by the breakwater installation – details of this study and the results can be found in Response 141b. This report describes how the current regime in the area of direct influence has been modeled using the field measurements taken for current direction and speed at one meter intervals through the majority of the water column levels between the seabottom and the surface every 10 minutes. The mathematic model was used to show the change in the current field and area of influence of the breakwater for current traveling in various directions and velocities. Based on various directions of travel i.e. parallel to the breakwater, perpendicular and at 45 degrees. Generally, the currents are relatively weak with velocities below 20 cm/sec for 94% of the time. For reference, the current speed for a 500-year return period is only 34 cm/sec and the maximum tidal affect is 8 cm/sec. Assuming a current velocity of 20 cm/sec the zone of influence beyond the perimeter of the breakwater is shown to be:

- The most frequent currents flowing towards the southeastern direction that is parallel to the orientation of the breakwater and the shoreline. In this most representative case, the currents remain undisturbed by the breakwater outside

a zone that extends beyond about 20 meters of each end and 40 meters of each side of the breakwater. As the currents and the breakwater are both parallel to the shoreline (northwest to southeast orientation) this is predominant case and effect.

- For the currents perpendicular to the shore, the undisturbed zone is estimated to be 160 meters from the breakwater.
- For currents at 45 degrees to the breakwater, the undisturbed zone is estimated to be 40 meters from each end and 80 meters from each side.

Further details of this current modeling study to show the change in currents caused by the breakwater are included in Attachment 141b.

Additionally, a detailed model of the dispersion of dredge spoil material as it is dumped in the disposal area was set up. This site is 2 km by 2 km in size area beginning 8 kilometers directly offshore from the project site. A separate current measurement program was conducted at the disposal site and mathematic models developed by the US Corps of Engineers used to check dispersion of the spoil during the dumping operation and the stability of the spoil mounds over time – see Response 104 for details of this work.

158. Does the environmental management plan consider any mechanisms that are based on the so-called “Social Responsibility of the Company?”

Response 158

Definitively, Corporate Social Responsibility is related to both social and environmental matters; accordingly, the protection of the environment forms part of the Community Relations Plan, it being a basic component to achieve community development.

159. In order to secure the closure of activities as well as the possibility of any unforeseen event occurring, has the company considered submitting an environmental guarantee?

Response 159

Please refer to Response 48.

DGH's OBSERVATIONS

160. The results of the studies made indicate that the air quality will be affected slightly; in spite of this, we deem it convenient to clearly specify which referential standards will be used to evaluate the air quality as a result of gaseous emissions.

Response 160

The LNG Plant will be designed to the World Bank Guidelines for emissions. These guidelines are in compliance with the Peruvian standards of Supreme Decree No. 046-93-EM and Supreme Decree No. 074-2001-PCM. Table 11 of Chapter IV of the EIA presented the results of the total air quality impacts associated with the project and ambient conditions. This table presented the ambient air quality standards of the US (EPA), Peru and the World Bank Guidelines. The most stringent value from these

standards or guidelines will serve as the referenced maximum permissible concentration limit for any particular emission contaminant.

161. In this regard, the section in the EIA containing the Legal Base indicates that Table 2 of Supreme Decree 046-93-EM will be used as reference; on the other hand, previous studies have used the Environmental Air Quality Standards approved by Supreme Decree No. 074-2001-PCM. The scope of application of the above-mentioned table must be clarified both by the proponent and the environmental authority.

Response 161

Please see Response 160.

162. In order to have an idea of the efficiency of the liquid effluent treatment system, it is necessary to amplify the information on the API and CPI separators, specifically with regard to their characteristics and specifications.

Response 162

Attachments 162a and 162b provide data sheets with specifications and a schematic for the API and CPI separators.

163. In the Environmental Management Plan a number of measures that are adequately oriented are proposed, but in some cases with a general scope and, therefore, difficult to audit. This is the case of hazardous wastes, which, although they are identified and classified, the treatment and final disposal procedures (how and where) are not specifically stated. In the same sense, a number of community relations programs are mentioned but not described.

Response 163

There are few wastes generated by the LNG plant. The feedgas into the LNG plant is already processed at the Malvinas NGL Plant with only carbon dioxide and possibly some heavy metal removal required for the liquefaction process. The removed carbon dioxide will be vented directly to the atmosphere. Recent well test samples have reconfirmed, there is no hydrogen sulfide or free sulfur in the Camisea gas. The BASF aMDEA system was selected due to not requiring amine reclamation equipment with associated wastes. The heating medium for the plant operates below the flash point and is at such low temperature that changeout of the medium should not be required during the life of the plant. Spent molecular sieve from the Natural Gas Dehydrators will be replaced every three years or more depending on the average daily volume of feedgas dehydrated. The molecular sieve will be repackaged in their original containers and returned back to the supplier for regeneration for later use at the LNG plant. The sulfur impregnated activated carbon material may eventually require replacing every three years or more depending on what remains from the heavy metal removal at the Malvinas NGL Plant. The spent sulfur impregnated activated carbon will also be repackaged and returned back to the supplier in the United States. Other wastes are from equipment operation including lubricating oils, filters and batteries. These wastes will be properly recycled or disposed of at approved facilities within Peru as indicated in the EIA or the solid wastes will be incinerated in an onsite incinerator. Exact amounts are impossible to provide at this time as several vendors provide similar equipment that may be used for the project with varying quantities of material. Until the

Engineering, Procurement and Construction contract is awarded for the project just prior to start of early construction and the contractor has made a final selection of equipment to be used, the exact amounts for waste from equipment will be unknown. Even then, it will be a function of the time and demand placed on the equipment while in operation that will decide when material is changed out to maintain a safe and efficient operation. Table 3 at Chapter V section 4.2.1.4 contemplates a list with a classification of liquid and solid waste to be produced during construction stage and Table 4 at section 4.2.2.4 contemplates a list with classification of liquid and solid waste to be produced during operations stage. Also, in Chapter V modules MR-1, MR-2 and RO-1, RO-2 provides specific management measures and final disposal for all type of waste that will be produced during PLNG construction and operations stages.

Regarding the Community Relations Program proposed in the EIA, the information contained therein is to serve as a guideline to prepare the company's Community Relations Plans for the direct area of influence of the Project. This Plan is currently being prepared and will embrace several concepts that are closely related to the strategic development for the area of influence, like information and communication with the community, education, sports, culture, etc.

164. In order to correct this observation, the proponent must not only be more specific in the two cases mentioned above, but in all others where it is necessary to specify procedures, quantities, places, etc., in order to make them auditable.

Response 164

A greater amount of goods and services will be required during the construction phase than during the operations phase due to the number of workers on site and the activities involved. Therefore, expectations have to be managed locally and contractually as to the amount and duration of goods and services that are required during the greater demand portion of the construction phase. Many of the same goods and services required in the construction phase will also be required in the operation phase, but in smaller amounts. The proper management of local supplies for construction including operations with the national supply used primarily during construction will provide continued local employment and economic stability.

165. Although it is true that the demand for goods and services will increase during the construction phase, which has been highlighted as a positive impact in the assessment, it is important to specify that this is a temporary effect and that once said phase ends, a negative effect will also occur which also requires management measures.

Response 165

A greater amount of goods and services will be required during the construction phase than during the operations phase due to the number of workers on site and the activities involved. Therefore, expectations have to be managed locally and contractually as to the amount and duration of goods and services that are required during the greater demand portion of the construction phase. Many of the same goods and services required in the construction phase will also be required in the operation phase, but in smaller amounts. The proper management of local supplies for construction including operations with the national supply used primarily during construction will provide continued local employment and economic stability.

Employees will be carefully selected, trained and assessed to assure the success of the operations and meet our commitment to health, safety and the environment. A system will be to select qualified employees, provide training and to assess employee performance.

PLNG through the Social Management Program and the Education and Training Program will include training activities to build capacities for workers. Thus, when the project demand for good and services decreases, the population will have other abilities to be employed in other activities.

More information is provided at Volume 1, Chapter V, Sections C, page 5.

166. In the section that deals with artisan fishing, data on increased revenues from retail sales are show, as well as weekly fishing volumes, but neither the texts nor graphs clearly show whether this data corresponds to individuals or families. This information is important for monitoring purposes, since according to the assessment, artisan fishermen would be among the most affected parties, especially during the construction stage in the sea area.

Response 166

The artisanal fishermen do not exclusively fish each day at the site. As evidenced by their meager catches and limited local market demand, they do not rely exclusively on fishing to support themselves or their families. They must work at other jobs in the region such as agricultural labor jobs with greater hiring during crop planting and harvesting seasons.

During the baseline studies, a survey was applied to 31 fishermen, but the information gathered through this instrument, involves data from all the family members. The data shows that the fishing activity involves other families' members. Women for example, use to sell fish in the local market. But, fishing is not a sole income generation activity, for example, men can be fishermen in one season, but during the crop season they can do agricultural work or before summer season they work as house builders.

Please also see Responses 13 and 110.

167. After reviewing the Environmental Impact Assessment filed by Peru LNG S.R.L., it has been that the company will be required to request a concession to use a water area for dredging operations, installation of a submarine emitter and a service wharf, as established in procedures B-02 and B-10 of the Sole Text of Administrative Procedures of the Navy – TUPAM-15001.

Response 167

The Application for the Aquatic Area Concession was filed with the General Bureau of Harbor Masters' Offices and Coastguards on October 2, 2003, and is currently underway. *See Attachment 167 containing a copy of the documents related to the Aquatic Area Concession Application.

168. The petitioner must submit a Hydro-oceanographic Study and the corresponding nautical signaling so that it may evaluated by the General Hydrography and Navigation Bureau of the Navy.

Response 168

The Oceanographic Study was part of the documents filed to apply for the Aquatic Area Concession. It elaborates on nautical signaling. See Attachment 167.

169. It must request the General Hydrography and Navigation Bureau of the Navy to consider in the national cartographic plan the inclusion of a portolan (a book containing charts and sailing directions) of said area.

Response 169

This step is directly taken by the General Bureau of Harbor Masters' Offices and Coastguards (an automatic process) and forms part of the procedure to obtain the Aquatic Area Concession, which is currently underway. Accordingly, the General Bureau of Harbor Masters' Offices and Coastguards sent us a letter informing us that, in view that we had filed an Application for an Aquatic Area Concession, we only had to answer observations 6 through 16 (Observations 167 through 172 of this document).

170. Moreover, it will be necessary to include in the docket containing the paperwork for the right to use a water area, those documents required for the installation of the service wharf, as follows:
- Application addressed to the Director of the Environment.
 - Descriptive report of the project signed by a registered engineer in this specialty.
 - Location map of the service wharf.
 - Payment for Administrative Paperwork.
 - Include a chapter concerning the service wharf to be installed in the Environmental Impact Assessment of the Sea Environment for the Construction of a Berth and Breakwater.

Response 170

All of these documents have been included in the application filed for the Aquatic Area Concession. See Attachment 167.

171. The marine facilities described in the Environmental Impact Assessment must be in line with what has been stated in the preliminary project.

Response 171

This information is contained in the Application filed for the Aquatic Area Concession. The maps are the same maps contained in the Hydro-Oceanographic Study and in the EIA. See Attachment 167.

172. The petitioner must conduct an Environmental Impact Assessment for the storage area of material to be dredged from the Melchorita Beach area.

Response 172

The EIA for dredging work and disposal storage area is included with the documents filed with DICAPI and is part of this EIA application. A 2 km by 2 km site was selected

for the storage area that will be used for disposal of the dredged material located at a water depth of between 20 and 32 meters offshore from the terminal. The middle of the deposition area is at 25 meters water depth located around 8 km from the shoreline. The baseline data and measurements for the proposed disposal area are included in the EIA and the proposed construction and monitoring methods are characterized and provided in Appendix 6 of Volume 2 of the EIA filed in July 2003.

Since the EIA submission, additional data has been developed to provide additional information to increase the detail of the baseline conditions and provide a greater understanding of the impacts introduced by the planned construction. These activities were initiated during discussions with the DICAPI Environmental group and by PLNG. The additional information pertaining to the 2 km by 2 km disposal site is submitted as follows:

DICAPI had suggested chemical and physical analysis of water samples at two locations. The following was conducted and the number of locations increased to four (4):

- Chemical test for heavy metals at two levels (total of eight samples),
- Suspended solids at three levels (total of twelve samples) with total, organic and inorganic values,
- Nutrients at two levels (total of eight samples),
- Plankton at surface, phyto and zoo
- Hydrocarbons at surface
- Salinity, temperature and oxygen content

Additionally PLNG acquired the following a five (5) locations:

- Chemical test of sediments for heavy metals,
- Sediment gradation,
- Sediment organic content,
- Sediment benthos analysis,
- Bottom sediment microbenthic analysis.

The results of these tests are provided as Attachments 172a, 172b, 172c, 172d, 172e, 172 f and 172g.

An Acoustic Doppler Current Profiler (ADCP) was deployed in the middle of the planned disposal site to measure the current and wave environment for an extended period of time. This was done from 05 November 2003 to 04 December 2003 to understand the regime of currents over one tidal cycle.

The dredged material is clean sand, silt and gravel material without any contaminants as reported by bottom samples and soil borings taken in 2003. No treatment or conditioning of the dredged material will be necessary. The dredged material will be placed in a 2 kilometers by 2 kilometers area beginning 8 kilometers directly offshore from the proposed Pampa Melchorita LNG site. Samples of sea bottom materials at the dredging location and the disposal area have been tested. The sea bottom materials have been tested for biological, chemical, and physical characterization and the seawater column have been checked for gradation, suspended solids, nutrients, biota, chemicals and hydrocarbons. Details of the location and testing are provided in the Annex 6 of Volume 2. Additional testing was also performed in November and December 2003 with the results presented as Attachments 172A through 172G. Comparing the analysis of the material to be removed and the natural material in the storage area shows that no treatment is necessary.

A description of the operations plan, environmental management plan and monitoring program is also provided in Annex 6. As indicated in Response 54, the monitoring program will continue until the bio system has been shown to be stable as compared to baseline conditions. It is expected that marine life will leave the immediate area due to the temporary increase in turbidity from dredged material placement and will only return once the activity has ceased. Turbidity measurements will be taken to ensure that there is no effect outside the work area.

The amount of dredging material stored should raise the sea-bottom depth at the disposal site a nominal 0.8 meters from the existing bottom depth that ranges from 20 to 33 meters. Geophysical and marine biology data has been obtained over the area and no adverse effects to ship navigation or marine life should occur.

Peru LNG has also conducted various mathematical modeling using specific site measurements and data to show how the dredge spoil will be distributed on the seabed in the designated disposal area. This detailed study was conducted to understand the dispersion of spoil that are made up of gravel, sand and silts. This dense mixture of sediment and water falls rapidly through the water column where the majority forms a mound on the seabed. This mound is then subject to the same long-term transporting process as the ambient sediments at the location resulting in spreading of the material over the seabed and mixing with the natural sediments. The dumping process and the long-term stability of the disposal mounds were analyzed separately. To support the analysis, the currents and waves were measured for a period of 30 days in the center of the 2 km by 2 km disposal site.

The US Army Corps of Engineers STFATE (Short Term Fate) model was then used to demonstrate how dredged material would behave during the descent through the water column. As different sizes of material will have a different vertical velocity profile the spoil make-up was conservatively assumed to be 70% fine sand, 20% coarse silt and 10% of fine silt to ensure that the components with the highest potential for dispersion are modeled. Each standard size spoil deployment would be approximately 6,500 cu m in size. The STFATE model predicts that all of the fine sand will have settled to the seabed within 50 minutes forming a mound approximately 100 m in diameter by 1 m high. The coarse and fine silt fractions will remain in suspension for longer time periods forming a density cloud that descends through the water column and disperses over time. Two hours after discharge, only 0.9% of the coarse silt is predicted to remain in suspension with the remainder settled to the seabed. The fine silt under the modeled conditions forms a thin layer of suspended material within a few meters of the seabed. Two hours after discharge, concentration levels exceeding 200 mg/l are locally confined to the bottom few meters of the water column and concentrations exceeding 50 mg/l are restricted to an area approximately 250 m radius of the disposal location. It should be noted that the existing seabed sediments at the same location are likely to be equally if not more mobile than this fine silt spoil material.

Another US Army Corps of Engineers model, LTFATE (Long Term Fate), was used to predict the long-term evolution of the mound shape and position as a function of the ambient wave and current conditions and the material grain size. The mound geometry predicted by STFATE was used as input. LTFATE predicted that essentially no long-term movement of a dredge spoil mound would occur in the designated disposal area. Other methods that give a higher consideration of the effects of the surface waves on sediment mobility were also used for comparison. These more conservative analyses indicate that individual mounds of spoil would be subject to reworking and mixing with

the natural seabed sediments. The result after several months would be a general smoothing of any peaks of the dredge mounds and dispersal and mixing with ambient seabed materials. Please see Attachment 104 for the detailed report of these analyses.

Geophysical and marine biology data has been obtained over the area and no adverse effects to ship navigation or marine life should occur.

Response 173

PLNG will comply with the standard normal indicators and with the national regulations in force regarding this subject.

174. In item AC-8, Sea Construction Activities, of the Environmental Management Plan, Chapter V, volume 1 of the evaluated assessment, regarding the “Actions to be Performed” in the dredging operations for the construction of an Access Canal for the Natural Gas Tankers, the fourth paragraph states the following:
“During dredging activities it will be necessary to monitor seawater turbidity ...”
In this regard, it is worth highlighting that the monitoring of potentially hazardous substances such as cadmium, copper, lead and mercury is not being considered, which substances have been determined in the sediment analysis of the “Baseline” study; for this reason, the monitoring thereof is required as a preventive control measure in order to prevent the possible inclusion thereof in the trophic chain.

Response 174

Although the Environmental Management Plan Module AC-8 of Chapter V of the EIA does not mention sediment monitoring during the construction phase, Module SM-5 contemplates sediment monitoring during construction stage (twice a year during autumn and spring to provide continuity to baseline data). The monitoring will be conducted at the same transect locations as conducted in the EIA and as presented in Table SM-5.1 for the same parameters such as cadmium, copper and lead. These parameters will be analyzed and compared with baseline results. In addition, Module SM-2 contemplates marine water quality monitoring every 3 months during construction activities for the parameters listed in Table SM-2.5, which include cadmium, copper and lead for comparison with baseline results. It is good, as discussed in Section 4 of Chapter III (page 4-22), that the concentration of cadmium measured during baseline studies was 10 times lower than the international criteria used for comparison (22 mg/kg); the concentration values measured for copper were also lower than the international criteria (91 mg/kg), the concentration of lead detected was lower than international criteria (600 mg/kg) and the concentration of mercury measured were lower than analytical detection method (0,10 mg/kg) and lower than international criteria (50 mg/kg), and with the preventive measure during the construction phase every 3 months water samples are taken and analysed for heavy metals that are encountered in the dredging zone. These baseline concentrations indicate that natural background condition that exists in the sediments within the project area. During the monitoring period, if statistical higher concentrations are detected as indicated on Module SM-5, further investigation will be conducted to establish and to control sources of contamination derived from construction.

175. For the operations stage, it has been established that sea water monitoring campaigns will be carried out at the same sampling points as for the environmental baseline studies for this project, located in the three transects established perpendicular to the coast, identified as T2, T4 and T5. In addition, a point will be sampled in the intertidal area of transect T3. The location of the transects will be:

- T2 located 500 m south of the projected axis of the trestle bridge;
- T4 and T5 located 500 m and 800 m, respectively towards the north of the trestle bridge axis.

In this respect, it should be mentioned that consideration is being given to the indirect area of influence of the sea activities pertaining to the sea terminal. In this sense, it is recommended to include at least two sampling points inside the Navigation Access canal for LNG Tankers, in order to control *total hydrocarbons*, in view that this is a direct area of influence for the traffic of the tugboats for said tankers.

Response 175

Peru LNG S.R.L. agrees to add at least two new seawater sampling points with sampling every three months to be located in the navigation channel to monitor the pattern of tug and tanker activity.

Any hydrocarbons released in the navigational channel by tugboats will be remediated in accordance to the physical and chemical characterization presented in Module AO-2 “Actividades de Mantenimiento” for dredging maintenance of the navigational channel and during sediment monitoring indicated at Module SO-3 (samples will be collected from different areas in the navigational channel every six months). In addition, any hydrocarbons released in the direct area of the navigational channel that could migrate into the indirect area and will be observed by the operator who will be required by EHS Company Policies and Contingency Plan to prevent and control such incidents during LNG cargo operations (see Module AO-1 “Operacion de la Planta y Cargue de GNL”).

176. Similarly, in Table SM-2.1 “Sampling Parameters in Different Points”, of the Environmental Management Plan, Chapter V, volume I of the assessment that is being evaluated, it is necessary to include in the sea water sampling parameters, as a control measure, the analysis of potentially hazardous substances such as cadmium, lead, mercury and copper, every six months.

Response 176

PLNG will comply with this requirement. Table SM-2.1 of Module SM-2 “monitoring of water quality during construction” indicates the parameters that will be analyzed during each monitoring event. The marine water samples will be analyzed for physical, chemical and bacteriological parameters at each sampling location. Table SM-2.5 of the same Module specifies which kind of physical, chemical and bacteriological parameters will be analyzed. Parameters such as cadmium, lead, mercury and copper are included in this monitoring program. Also, see Responses 54, 75, 80, 82, 123, 174, and 186.

177. Likewise in Table SM-2.7 “Monitoring Format for Water Discharge from the Hydrostatic Test”, of the Environmental Management Plan, Chapter V, Volume

1 of the assessment that is being evaluated, it is recommendable to consider the analysis of each toxic element, instead of the total toxic metals.

Response 177

PLNG will comply with this recommendation. Table SM-2.7 of Module SM-2 “monitoring of the water quality during construction activities” includes the analysis of individual metals. The last column of Table-SM 2.7 provides the World Bank Guideline Discharge quality criteria that will be used to compare and evaluate the monitoring results. See Response123 for seawater monitoring of individual metal components. If non-saline water is used for hydrostatic testing, it will be used for irrigation and not discharged to the ocean when possible.

178. In paragraph No. 2, item AO-2, “Maintenance Activities” of the Environmental Management Plan-Operation, chapter V, volume 1 of the assessment that is being evaluated, it is mentioned: *“Prior to the dredging operations to provide maintenance to the approach canal, the material must be characterized from a physical and chemical standpoint ...”*, in this regard, we deem it necessary to include the analysis of potentially hazardous substances (Cd, Pb, Cu and Hg) and hydrocarbons.

Response 178

Peru LNG S.R.L. confirms that it plans to test for concentration of individual toxic elements as part of the physical and chemical characteristics listed in Table AO-2 prior to any maintenance dredging. The sampling procedure will be the same as Module AC-8 “sediment monitoring during construction”. The data shown on Table SO-3 “marine sediment analysis during operation” will be used to present the data. Also see Response 12. The analysis of potentially hazardous substances are included in the chemical characterization for material to be dredged as required by international organizations such as OSPAR, USEPA and OMI as referred to in Module AC-8 and as provided in Table SO-3.1 of Module SO-3 “sediment monitoring during construction”. Also see Response 123.

179. In point 2 of the third paragraph of the RO-1 Monitoring Program, which refers to the Management of Liquid Wastes from the Process, it is said: *“The water from the separation process of the API tank will be mixed with brine from the desalinization plant and discharged into the ocean”*. Moreover in Table RO-1.1, Liquid Waste Sources, it is indicated that the treated effluents that will be discharged into the sea come from the Condensate Dehydrator Generator from V-1105, runoff from paved areas”. For this reason, it is considered necessary to include an annex to the Environmental Impact Assessment for the installation of a submarine emitter to discharge the aforementioned treated effluents, which must have a sampling point prior to being discharged into the sea, and other sampling points in the effluent discharge area. In this way, it will be possible to periodically control the quality of the discharged effluent, in accordance with the guidelines of Directorial Resolution No. 0052-96/DCG dated February 29, 1996, Environmental Impact Assessments related to projects for the construction and installation of sub-aquatic pipes for the discharge of treated effluents.

Response 179

Peru LNG S.R.L. has continued to evaluate the best method and location for the water outfall. The normal flow is equal to the capacity of a 75 mm size pipe and carries brine from the desalination plant plus condensed water from the process. We have determined that an outfall from a horizontal pipe located one meter above the highest water level is better than a submarine emitter to provide improved dilution of the elevated salinity of the effluent. The study also showed that moving the outfall from 4 meters depth to 7 meters depth provided improved dilution. Peru LNG S.R.L. recommends a horizontal discharge above the sea level at a location 500 meters from the shore and to not use a submarine emitter. The dispersion study is shown in Attachment 50. Peru LNG Response 125 also applies. There will be a sampling point to test the quality of the effluent discharge prior to being discharged into the sea – Figure S)-2.1 “effluent monitoring during operations” shows this sampling point. Also note that Figure SO-4.1 “Marine Habitat Monitoring Stations” has sampling points at the 7 meters water depth where the emitter will be located. Additionally, Figure SO-2.2 “water monitoring stations for operations” will be modified to show sampling points at the 7 meters water depth at transects T2, T3 and T4 in addition to the two additional sampling points in the navigational channel as noted in Response 175 above.

180. As regards the Contingency Plan to control hydrocarbon spills as well as of other contaminating substances into the sea, the scenarios must include those incidents that could result from accidents involving the tankers that transport hydrocarbons. Furthermore, Appendix 3 – spill equipment list – does not consider barriers and containment equipment to control hydrocarbon spills such as diesel.

Response 180

Peru LNG has conducted additional studies to further review the oil spill contingency plan included in the original EIA submission. The detailed Oil Spill Response Report is provided in Attachment 180A and our Incident Report Form is provided as attachment 180B.

These studies included several parts:

- Identifying credible spills,
- Forecast the movement of spills using actual environmental conditions,
- Outlining broad response strategies to be followed by the Incidence Response Commander,
- Revising the equipment list proposed in the EIA.

A set of worst credible accidents was selected for modeling spills to develop a response strategy. Accident cases were developed for both tugs and the LNG carriers. For the tug cases, a spill of 2 cu. m. of diesel during a fuel transfer operation was considered as a higher probability case for a worst credible accident and a spill of 140 cu. m. of diesel from a tug actually sinking was used as a very low probability of occurrence for a potential credible spill scenario. For the LNG carrier, a spill of 2,000 cu. m. of Bunker C fuel was considered, assuming a tanker is grounded and holed on the breakwater with an instantaneous release.

The fate of oil slicks was numerically modeled using very sophisticated programs for up to three days after each release until shoreline impacts were no longer significantly changing. The modeling allowed for wind, tide and current data for the site in both the

summer and winter conditions and also examined the natural dispersion and the amount of oil that might evaporate.

Based on a review of the model results and an understanding of the physical environment and details of the operating facility a response plan and updated equipment list has been developed. The revised equipment list is provided below and includes booms and recovery equipment that make containment feasible.

Annex 4, par 2.3 (revised) – Marine Spill Response Equipment

Item	Quantity	Application
Inflatable Boom 1 – 1.1 m overall height, durable fabric, >10:1 buoyancy:weight ratio	200 m	Contains diesel, Bunker spills close to source
Boom Reel (with enclosure)	1	For quick boom deployment
Powerpack	1	For reel, inflating boom
Anchor assemblies	4	Position boom at spill
Towing bridles	2	Facilitate towing boom
Skimmer - modular unit with double drum and brush components, onboard pump	1	Recovers diesel, possibly fresh Bunker in boomed area
Hoses, connectors, fittings for skimmer	1 set	Allows deployment inside boom
Powerpack , diesel/hydraulic	1	Powers skimmer
Oil Snare sorbent	10 boxes	Recovers small Bunker spills
Sorbent pads 8-10 oz polymeric (100/bale)	10 bales	Recovers small amounts of diesel possibly Bunker
Sorbent boom (10 ft x 10 in. – 4 per bag)	5 bags	Supplement oil containment
Sorbent roll 100 ft - 150 ft x 30 – 36 in.	1	Protect walkways from oil
Sorbent socks 4 ft x 4 in.	20	Contain small diesel spills on tug or platform
Disposal Bags – 6 mil	100	Store oily sorbents
Drums 55 US gal, removable lid	4	Store collected oily materials
Storage bladders, floating @ 5,000 liters	2	Interim storage of diesel, possibly Bunker
Pump 2 inch double diaphragm or equivalent with hoses, fittings	1	For general transfer duty
Container(s)	1 or 2	For storing equipment

181. As regards the composition of the technical team in charge of preparing the Environmental Impact Assessments, the participation of Dr. Juan Acosto Polo, Phycology Specialist is mentioned; however, his signature does not appear.

Response 181

PLNG is providing a legalized certificate to confirm Dr. Polo's participation. Attachment 181 is a copy of the document signed by all the technical team in charge of preparing the Environmental Impact Assessment

182. As regards the analysis reports, discrepancies have been noted therein. Following are some examples: In Annex 6 of the Environmental Impact Assessment, in connection with the dredging operations, two assay reports are presented for the sediment analysis made by the laboratory Envirolab-Peru S.A.C. issued with the same number (No. 304141) and each one with different dates and of them does not bear the General Manager's signature. Likewise, in Annex 2, Sea Water Lab Results, in the copies of the reports issued by the Pan American Center of Sanitary Engineering and Environmental Sciences, it is note that the report of Analysis No. 342 is included both for the company GEOMAPP DIGITAL SAC and Golder Associates Peru S.A. In view of the foregoing, it is recommended to request the original lab reports from Peru LNG S.R.L.

Response 182

In Annex 6, page six of the laboratory report no. 304141 by Envirolab-Peru S.A.C. has a seal but not a signature; an internal document was submitted instead of one with a sealed and signature. We are providing Attachment 182, the original documents from Envirolab containing seals and signatures. The seawater samples noted in Annex 2, Report 00342, were contracted by Golder as the prime consultant to Peru LNG and Geopmap Digital was subcontracted by Golder to conduct the marine baseline studies. Samples collected in preparation of this EIA were sent to the laboratory by either firm on behalf of Peru LNG.

With respect to laboratory analytical results in Appendix 2, Golder is the prime consultant contracted by PERU LNG SRL to conduct the EIA and Geomap Digital SAC was subcontracted by Golder to conduct marine baseline studies so samples taken in this EIA work were sent to the laboratory by either firm on behalf of project owner.

IMARPE'S OBSERVATIONS

183. The coastal protection works and other planned infrastructure works will have an impact upon the circulation, transportation of sediments and bottom morphology. The current studies conducted by IMARPE on the direction and intensity of currents provides important information for the transportation of sediments. Therefore, the company must provide complementary information.

Response 183

Currents have been measured at the site of the breakwater from June 2002 to May 2003. As shown in the figure below which presents at the seabed, velocities are low

normally exceeding 0.1 m/s only 7.2% of the time and 0.2 m/s only 0.05% of the time. From October through February there is a small southeasterly flowing residual current. This residual current disappears throughout the rest of the year. These measured currents are presented as scatter graphs in Figure 183-1 shown below. Additional current measurement data is included in Attachment 141a.

The breakwater structure, parallel to the shore, will have a minimal interference on these currents. Figure 183-2 below presents the results of a current model showing the breakwater's local magnification of currents. It shows that velocities close to (i.e., on top of) the breakwater are magnified by a factor of 3, but as shown by the streamlines, there is almost no change in the currents at distance 100m from the breakwater.

Since the trestle and wharf structures will be constructed of steel pipe piles, they are extremely porous and will not affect currents.

These figures show that the currents at the site are very low and the proposed structures will minimal influence on them. Further details of the breakwater effect on the local currents are included in Attachment 141b.



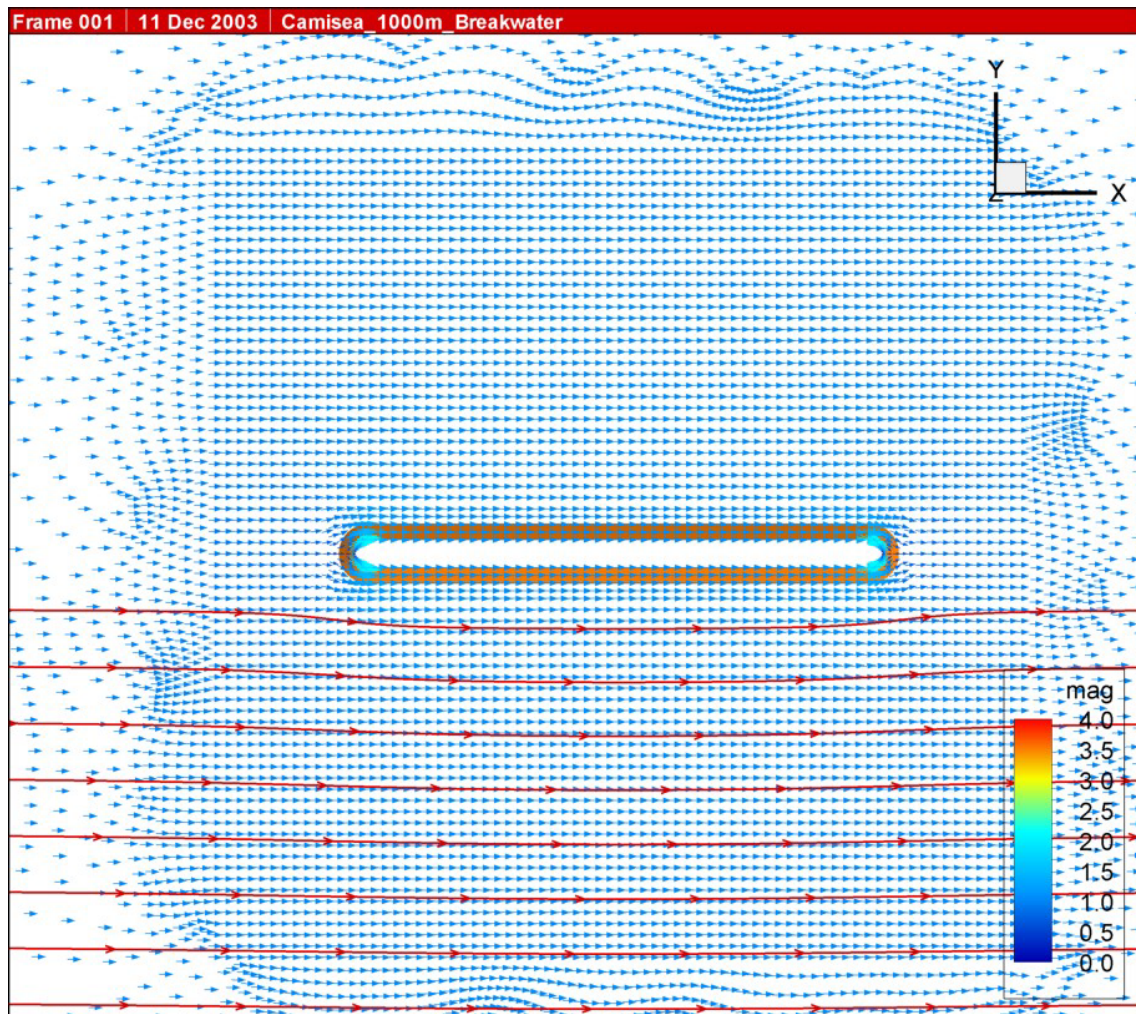


Figure 183-2 - Impact of Breakwater on Current Velocity

184. Submit the frequency of modification of the effects in the morphologic conditions of the sea bottom in order to maintain navigation conditions.

Response 184

Waves and currents will move bottom sediments into the navigation channel established for providing ship access to the berth. Hydrodynamic modeling shows that the sandy non-cohesive sediments moving as bed load will build-up slowly on the channel side slopes; most of the fine sands however are moving as suspended load and this material is expected to settle throughout the dredged channels. The highest sediment deposition rate occurs during high wave conditions with some areas of the channel having higher deposition rates than others. Because of the variability of wave environment in some years over the average, an annual deposition rate cannot be ascertained and therefore it is important to understand the effects of worst-case scenarios for forward planning.

The basic design of the dredged channel allows for the channel to be constructed with a minimum margin of 25 meters of additional width to provide a storage area for sediment build-up. In addition, there will be about 2 m of overdredging of the channel bed to allow for collection of the suspended materials. Analysis to date suggest that

the maintenance dredging maintenance interval will be more than every two years - generally, three to five years is anticipated.

Although the operational current climate has been measured on an ongoing basis and is understood (see Response 157) accurate techniques to forecast the sediment transport regime in a complete three-dimensional model, especially in a very fine sediment and low velocity environment, cannot be accurately modeled within an order of magnitude accuracy. The dredging plan is to design on a conservative basis and monitor actual changes in sediment dynamics to plan maintenance programs.

The major cost of maintenance dredging will be mobilizing dredging equipment with the volume of material to be removed having only a minor effect on the cost of total maintenance dredging operation. Extra quantities of excavation can be provided during future maintenance dredging exercises on the sides of the channel or as separate traps before the main channel at reasonable cost and the maintenance dredging program can be modified and adjusted as actual conditions are monitored.

185. The distribution of resuspended material, very little of which is fine according to the studies, will be possibly transported in the water column far away from the site and selectively deposited based on the decrease of energy of the currents. Faced with these conditions, the organic material (which seems to be very scarce) would be quickly degraded through oxidation, due to the presence of dissolved oxygen in the environment. Therefore, the company must indicate what the content of organic matter is.

Response 185

A physical description of samples of sediments collected at the proposed navigational channel is presented in Appendix 6 of Volume 2 and indicated that samples collected and evaluated contain very little organic matter based on visual and physical evaluation and based on the samples reaction to hydrogen peroxide.

The quantity of organic material, weight percent, was later analyzed in sediment samples recovered from four boreholes at varying depths. This data shows that organic matter ranges from 0.8 to 1.5 percent at sampling depths ranging from 0.0 - 0.3 meters, 0.4 to 2 meters, 2 to 3 meters and 4.7 – 5.15 meters. This data is provided as Attachment 185A.

Samples of sediment and water were taken in February 2004 and analyzed for 5 day Biochemical Oxygen Demand (BOD₅). This data is provided as Attachment 185B. All samples demonstrated low values of oxygen demand, which is indicative of low organic matter content and unpolluted sediment and water. The sediment samples had BOD₅ values that ranged from 0.7 to 5.2 ppm. The water samples taken one meter from the sea bottom were slightly higher where the BOD₅ values ranged from 5.3 to 8.5 ppm. These were slightly higher probably due to the suspended organic matter normally carried in the Humboldt Current. The low BOD₅ values indicate that there would be minimal impacts from organic matter that may become suspended during dredging as the BOD₅ of the sediment is less than the seawater. As a reference, the inlet to a domestic wastewater plant averages a BOD₅ of about 250 and can be as high as 500 with treated wastewater discharges of 30 to 40 BOD₅.

During dredging operations and construction of the breakwater, the movement of sediment in the water will be monitored as outlined in Modules SO-2 and SO-3 of Chapter V. The monitoring program will include monitoring of turbidity at the designated areas in the monitoring plan to ensure that turbidity is not exceeded above background levels outside the mixing zone (module SM-2 for construction). Mitigation measures have been designed to reduce or temporarily cease the dredging or deposition of materials for the construction of the breakwater in case turbidity levels are found to be more than 200 mg/l. The monitoring program will ensure the sediment movement is controlled and maintained within a localized area of the construction activity.

186. Submit as part of the scheduled monitoring program the study of variations in erosion, transportation and sediment conditions. Likewise, the geochemical conditions of the surface sediments of the study area must be monitored.

Response 186

Variations in erosion and sediment transport conditions are considered as part of module SO-7 "Monitoring of the Coastline" in Chapter V. Following the elements of this proposed monitoring program are described as follows:

Approximately seven kilometers of shoreline will be surveyed every six months during construction and operation stages of the project. The area to be surveyed encompass 4,5 kilometers of shoreline north from Trestle alignment and 2, 5 kilometers south from the aforementioned.

A detail topographic survey along area to be surveyed will be conducted before construction starts to establish reference points. At reference points, transect lines of 150 m length perpendicular to the coastline will be set to monitor physical profile changes every six months. This monitoring transects will be of 50 m covering a segment of intertidal zone and 100 m covering the subtidal zone. Visual aids such as photographs and video will be taken in combination with field measurement methodologies taken at each profile.

All data gathered from this bi-quarterly field monitoring program will be used to assess any morphological changes introduced at shoreline in combination with local and regional aerial photographs.

Rates for accretion and or erosion will be estimated at identified surveyed areas with any morphological changes.

The rationale of this monitoring program is that any changes in the sub-tidal zone such as sediment transportation and erosion as a result of introducing marine project structures in natural environment will be reflected at the shoreline due to the shallow and gentle slope characteristics of the seafloor and distance from shoreline to the marine structures that will be constructed (i.e. breakwater and dredged navigational channel will be at approximately 1.5 kilometers from shoreline at -14 m depth).

In reference to the monitoring of geochemical conditions on surface sediments they are also considered at modules SM-5 (construction stage) and SO-3 (operation stage) in Chapter V. Among the geochemical conditions set at baseline studies (see Section 4 of Chapter III, Table 4-16 for monitoring results during autumn of 2002 and Table 4-17 for monitoring results during spring of 2002), eight parameters (Arsenic, Cadmium,

Copper, Chromium, Mercury, Nickel, Lead and Zinc) including TPH (Total Petroleum Hydrocarbons) will be monitored during autumn and spring seasons at ten selected stations. These parameters were selected because they are parameters associated with potential environmental effects derived from construction and operation activities of the project.

PLNG will submit as part of the scheduled monitoring a report of the requested variations and geochemical condition.

187. Submit the Monitoring of the physical and chemical parameters in sea water conducted on a monthly basis (as for the case of effluents) at least during the first year of operations and not on a quarterly basis as contemplated in the management plan; this assessment must also include TPH (Total Petroleum Hydrocarbons).

Response 187

As indicated at Module SO-2 "Monitoring of the Water Quality" in Chapter V, seawater sampling for physical chemical and bacteriological analysis will be conducted every three months during the first year of operations. This sampling frequency was established to characterize the seasonal changes that may potentially occur as a result of mid to long-term environmental effects derived from project operations, since short-term effects will be rapidly assimilated by the dynamics of the local marine environment. Since this is designed to measure mid to long-term trends and not short term, PLNG instead proposes to modify the monitoring program from every three months to every two months. Table SO-2.4 included in the aforementioned module SO-2 includes a list of 29 physical-chemical parameters and 4 bacteriological parameters to be analyzed during seawater quality sampling at first year of operations; among listed physical-chemical parameters, TPH is included as one of the organic compounds to be analyzed in the water samples to be collected.

188. Submit in the Sea Quality Monitoring parameters such as nitrates and phosphates, nutrients which are better indicators of the sea water quality during construction, considering that there could be a significant increase therein, in addition to nitrogen and total phosphorous.

Response 188

Physical and chemical parameters of aquatic quality listed at module SM-6 "Monitoring of the Marine Ecosystem" in Chapter V, to be monitored during construction stage, will include as per the suggestion of IMARPE parameters such as nitrates and phosphates, in addition to parameters already included at this listing, Total Nitrogen and Total Phosphorus. Nitrates and phosphates are parameters highly related with biological and organic effluents such as sewage and agrochemical product effluents. It is expected that all potential discharges from all wastewater treatment systems utilized during construction and operation will be used for irrigation and will meet the established regulatory limits.

189. The assessment of zooplankton is inadequate since the sample collection method is inadequate. In the study it has been indicated that samples have been gathered using 75 micron nets and with this net only a fraction is

evaluated: micro zooplankton is gathered with a 300 micron mesh net. The company must use this type of net.

Response 189

Phytoplankton was gathered using a 75 micron net and zooplankton was gathered using a 300 micron net. The previous information provided in the EIA in Vol. 1, Section 3.2.2 of Chapter III was a transcription error in the description of the subtidal sampling methodology. Thus, the results of the sampling are adequate for this EIA.

190. The EIA does not recognize the generation of impacts during the construction stage, during which benthonic communities, sediment quality and surface water will undergo severe or moderate impacts as a result of the removal, resuspension and transportation and deposition of sediments. With regard to the latter the company must define the measures to be adopted to mitigate the modification of the coastline.

Response 190

The "Impacts Identification" Table 1 of Section 2, Chapter IV identifies the potential effects of turbidity to the water and water quality (H-1 and H-2), alteration in structure and composition of marine communities (FF-2), and alteration of the coastline morphology (SU-4). Furthermore Section 3 presents Tables 6 and 7 that provide an "Evaluation of Impacts". The potential impacts associated with the construction and operation activities have been qualified in the EIA by specialists according to criteria and values provided at Tables 3, 4 and 5 of Chapter IV. Finally, a discussion on these potential impacts is provided in the same Section 4 of Chapter IV, "Analysis of Impacts", specifically in Section 4.1.4 "Water Resources" and Section 4.2.1 "Terrestrial and Marine Flora and Fauna". Module SO-7 of Chapter V defines a monitoring program of the coastline, prior to and after construction activities. The monitoring activities will be conducted between 1 km south and 3 km north of PLNG property boundaries. Perpendicular transect lines, 150 m in length, from the shoreline will be established to obtain profiles of the dry and submerged zones. Surveillance along study area of the coastline will be also conducted. Accretion and erosion rates will be determined through the environmental monitoring program. If significant changes are identified during the monitoring program, corrective measures will be designed and implemented that will restore the coastline.

191. The company must indicate how it will preserve the spawning area of species that would be affected by the movement of non-fishing vessels.

Response 191

Fish spawning areas are highly affected by changes in water temperature and salinity. The effluents associated with the PLNG plant, marine facilities and vessels will be treated and discharged according to water quality criteria established in modules RO- 1 "Liquid Waste Management" and SO-2 "Monitoring of the Water Quality" which consider the habitat conditions. Any changes on the marine ecosystem derived from vessel operations, terrestrial plant operations, and marine operations will be detected by the monitoring program which includes evaluation of physical-chemical quality parameters of marine water and sediments (module SO-2 and SO-3 respectively) and evaluation of marine biological and community parameters (module SO-5). Other

effects on fish spawning areas such as water turbidity produced by vessel's engines will be minimized by the low frequency of LNG loading into tankers (shipments) and the restriction of other vessels (such as artisanal and commercial fishing) to enter and navigate within the surrounding waters of marine PLNG facilities.

192. In the socio-economic aspect, indicate the adequate compensation for the population (artisan fishermen) and the environment taking into account that the income of these fishermen is obtained from this activity. They are grouped in various associations such as the Sindicato Independiente de Pescadores de Cerro Azul (SIPICA), Asociaciones de Pescadores Cordeleros de Herbay Bajo, Santa Barbara, Cerro Azul, Bujama Baja and Mala.

Response 192

Please see Responses 13 and 113.

193. In the assessment, with regard to dredging, a limit value of 200 mg/l in the sea environment is proposed. The company must indicate what the referential source of said value is and what the equivalent thereof in NTU turbidity units is.

Response 193

The 200 mg/L concentration of suspended solids is a provision proposed by The International Finance Corporation in its document "Environmental, Health and Safety Guidelines for Port and Harbor Facilities" of 1998, to be implemented to ensure that impacts from dredging are minimized. The criteria referenced in the EIA Module to monitor turbidity associated with construction activities is best suited for the proposed project. The World Bank Guidelines do not list a limit for turbidity in NTU units or suspended solids because these limits are site specific. Turbidity limits in units of NTU could be established as site specific conditions correlated to suspended solids prior to the start of construction. Surface water criteria in the US generally recommends the use of a specific value of NTU (i.e., 29 NTUs) or less above the natural background levels.