

# Draft Environment and Social Compliance Audit

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Project Number: 47928  
August 2013

## IND: Dahej Liquefied Natural Gas Terminal Expansion Phase III

Prepared by Vimta Labs Ltd. for Petronet LNG Limited

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**CONFIDENTIAL**

**Draft REPORT**

**Project Proponent:**



**PETRONET LNG LIMITED**  
New Delhi

## ***Environmental & Social Compliance Verification Audit***

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## 1. Introduction

**Petronet LNG Limited (PLL)** is operating its existing LNG Import, Storage and Re-gasification facilities with a capacity of 10 MMTPA in Gujarat. This facility (hereafter referred to as subject facility) is located at distance of 5.8-km from Dahej town in SW Direction in Baruch District, Gujarat state. PLL is proposing to expand the capacity of subject facility to 20 MMTPA.

PLL would like to perform a Compliance Audit of the subject facility and requested Vimta Labs Limited, Hyderabad (Vimta) to carry out the same. In response to the above request, Vimta has prepared a preliminary report based on the documents made available by PLL. The subject facility was not specifically visited but has been discussed with PLL's corporate project cell. A comprehensive Environmental and Social Compliance Verification Audit report will be prepared after site visit to the subject facility at a later date.

The Environmental & Social Compliance and Performance Review of the subject facility integrates compliance audit and license reviews with ongoing industrial activities/ operation. These reviews include assessing compliance with legislative requirements and review of best environmental management practices. Industry, licensees, state agencies, local government, the community and other stakeholders have been considered during the review program.

Vimta has completed a preliminary review focusing on various environmental and social issues pertaining to the subject facility and its scale of operations. The object of this review is to increase the awareness of:

- Activities and practices that have the potential to affect the environment and social aspects and their compliance with respect to the regulatory frame work;
- Best environmental management practices to handle environment and social aspects in and around the subject facility.

## 2. Brief Description of the Project

Subject facility would receive and store LNG that is unloaded from ship tankers and regassify the LNG into natural gas for delivery to a pipeline. The terminal would be expected to operate continuously, with a design capacity of 20 MMTPA after proposed expansion. Existing LNG terminal consists of the following facilities:

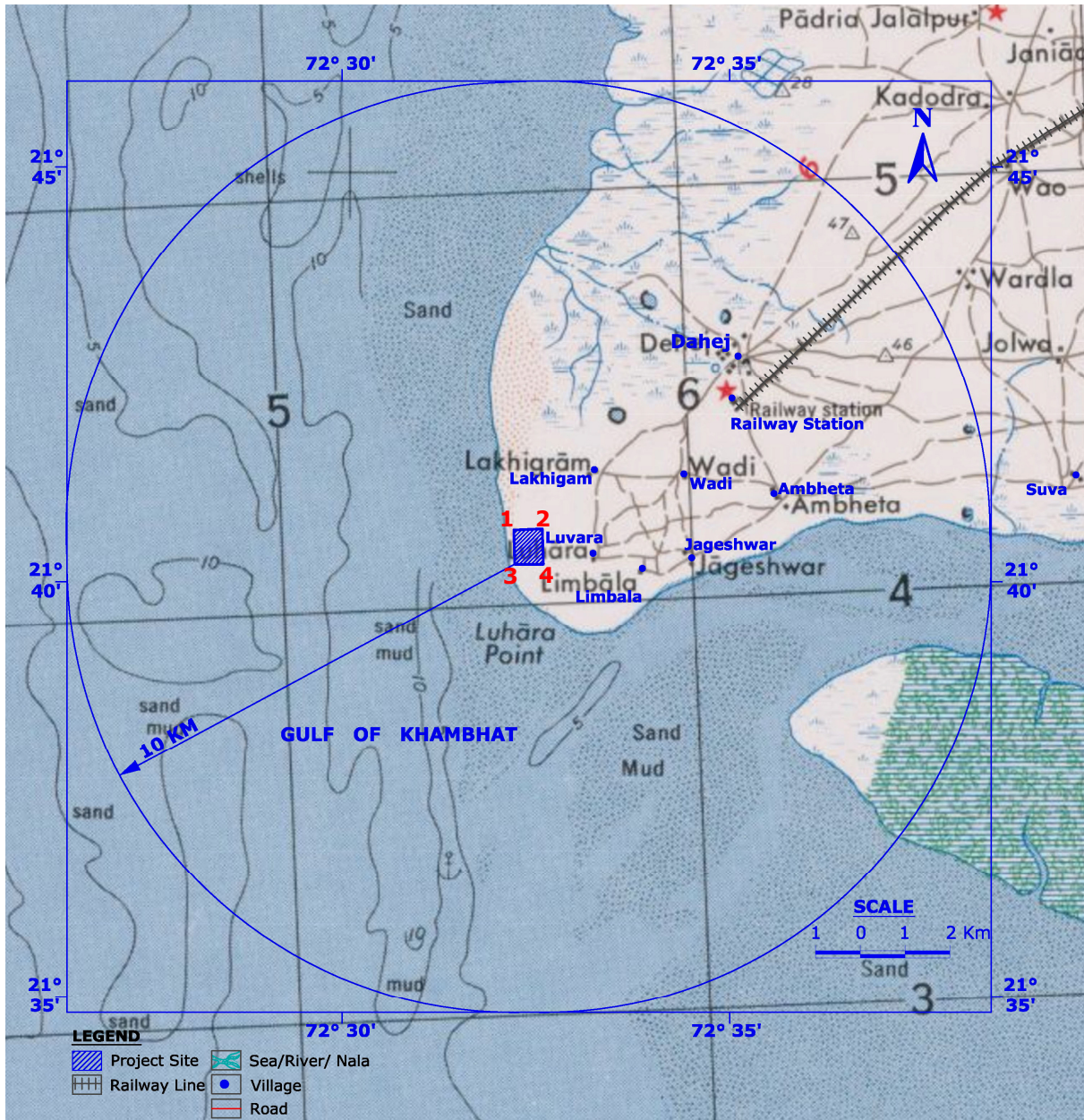
- A) Marine
  - Jetty with unloading platform & unloading arms;
  - Trestle;
  - Berthing & mooring dolphins LNG Jetty; and
  - Stand by jetty (under construction)
  
- B) Onshore
  - Storage Tanks
  - LP & HP Pumps;
  - Vaporizers; and
  - Utilities.

The index map showing the location of the subproject facility are given in Figure-1 and Figure-2, respectively. The plant lay-out and photographs of the existing facility are given in Figure-3 and Figure-4, respectively.



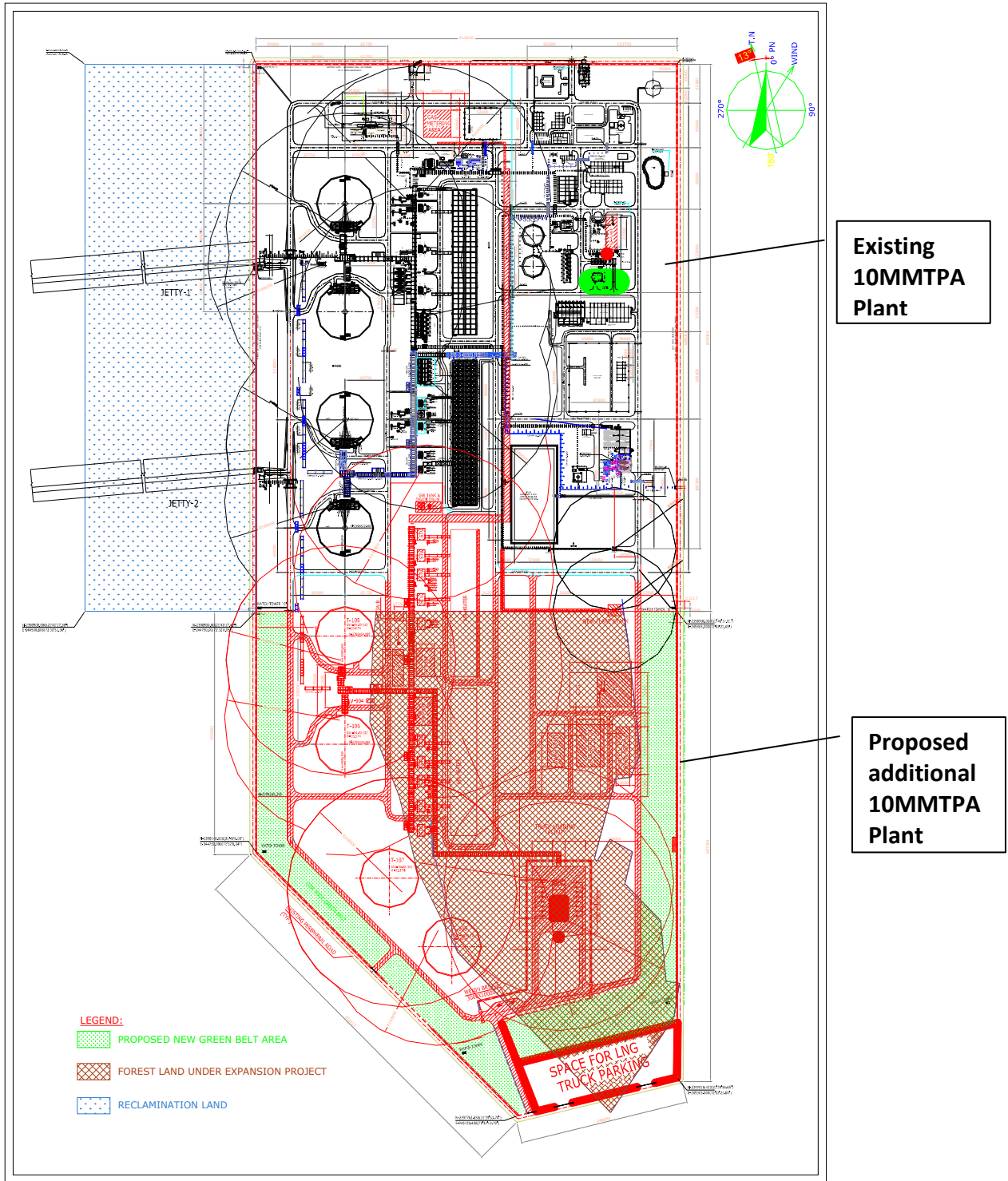
**FIGURE-1**

**INDEX MAP SHOWING THE PROJECT SITE**



**FIGURE-2**  
**STUDY AREA OF THE PROJECT SITE**





**FIGURE-3**  
**SITE MAP SHOWING FACILITIES**



**FIGURE-4**  
**PHOTOGRAPHS OF THE EXISTING LNG FACILITIES**

PLL's existing facility has been set up within a land of 48 Ha located within the notified industrial area of Gujarat Industrial Development Corporation (GIDC). No private land has been acquired and hence no displacement of habitation involved while setting up the existing facility.

### 3. Process Description

LNG at atmospheric pressure and (-)162°C will be transported by sea from LNG exporter by means of specially designed and dedicated LNG vessels of 80,000 m<sup>3</sup> to 2,66,000 m<sup>3</sup> capacity at the captive jetty of the subject facility at Dahej. LNG will be unloaded at the rate of 15,000 m<sup>3</sup> by using unloading arms from LNG vessels. Annual throughput of LNG at the jetty is expected to be 5~10 MMTPA. The unloaded LNG will be pumped through dedicated pipelines to the LNG storage area. Capacity of LNG storage tanks has been firmed up after detailed engineering of the LNG terminal. Subsequently LNG will be gasified in the regasification area.

Regasification will occur by means of heat exchange using Gycol water in a close loop. After regasification, Natural Gas (NG) will be made available to various NG consumers' e.g., power industry, fertilizer manufacturers, glass industries, steel industry etc. It is to be noted that LNG provides the most economical and most environmental friendly option.

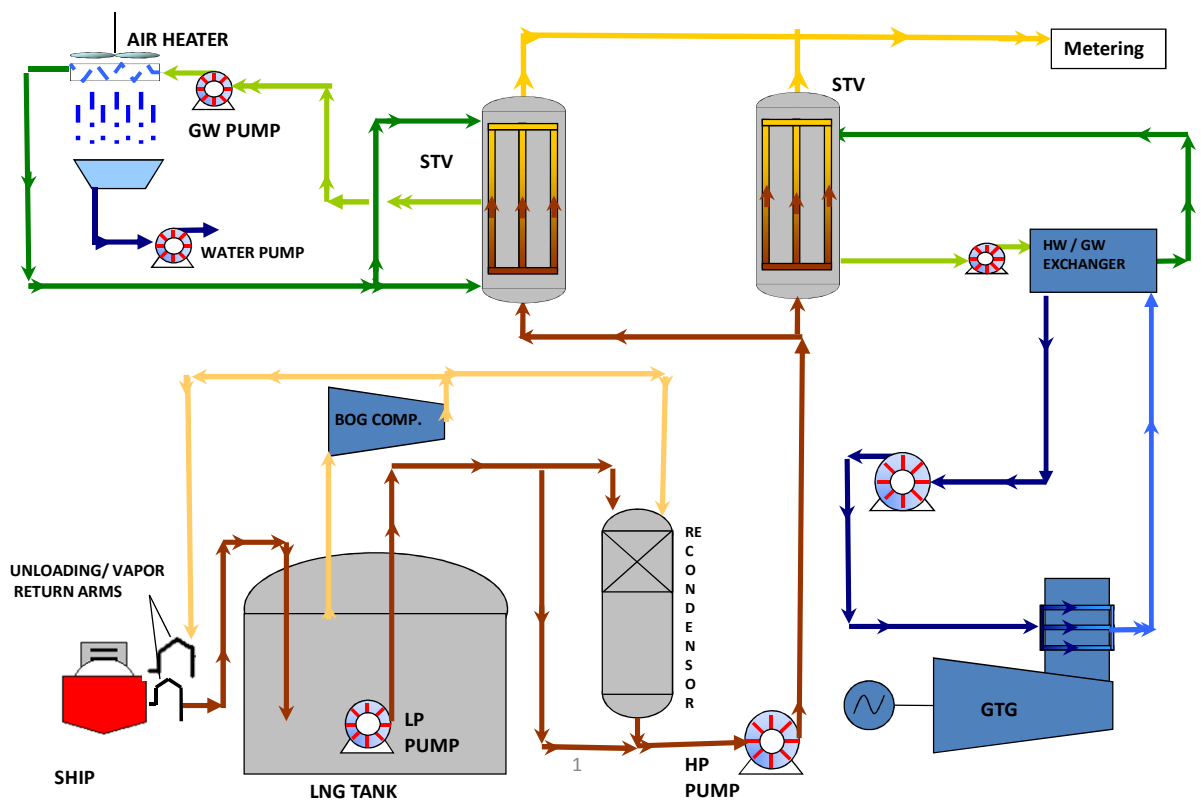
As per optimization strategy, closed loop waste heat recovery Shell & Tube LNG vaporizers will be installed to recover waste heat from flue gases from gas turbine generator exhaust. Also cold energy from LNG will be utilized for air conditioning of buildings. Typical LNG unloading and regasification facilities process flow is shown in **Figure-5**. Process flow diagram of LNG vaporization and send-out facilities is shown in **Figure-6**.

### 4. Regulatory Framework

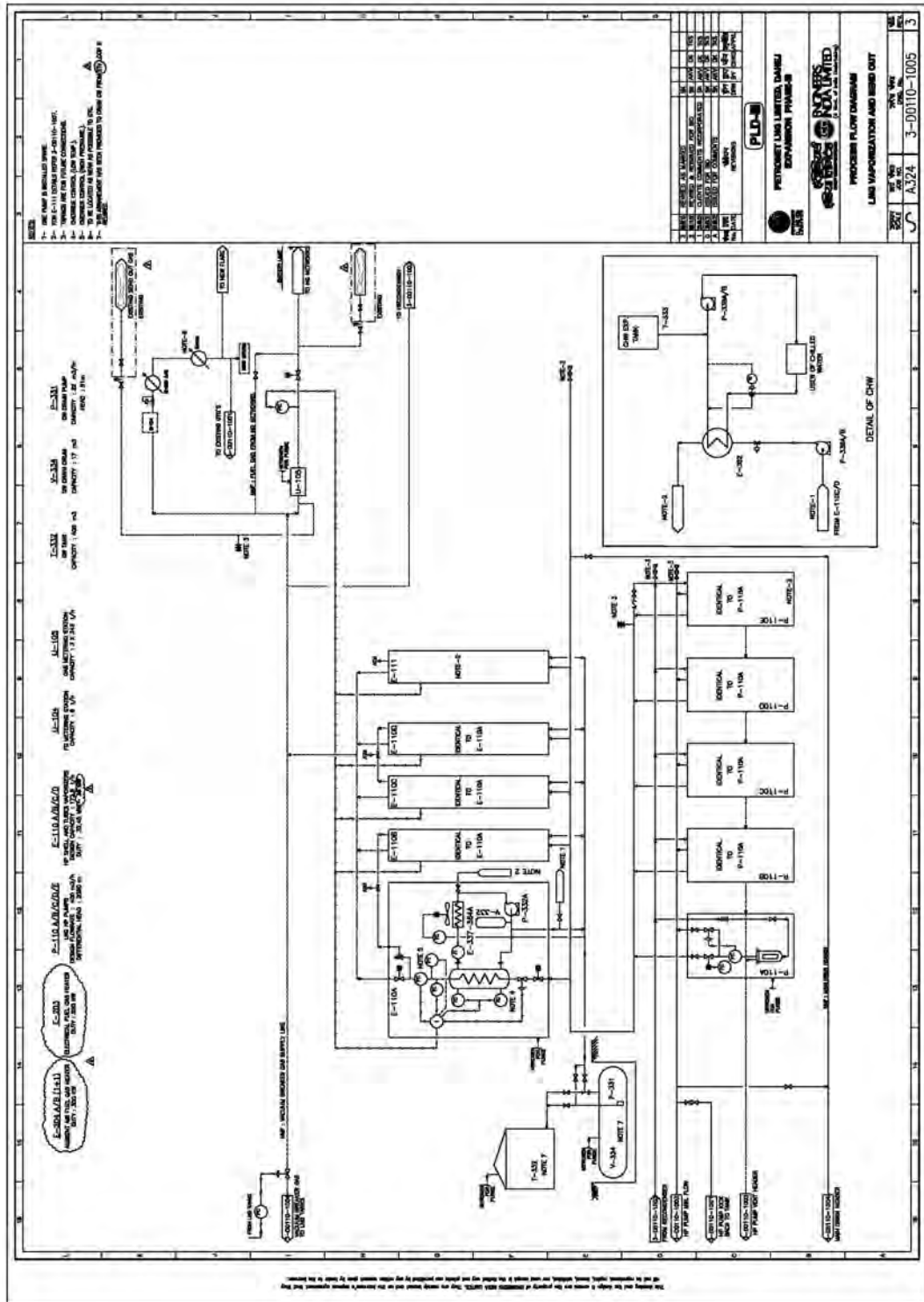
The relevant legislations under which project would be evaluated have been listed below:

- Petroleum and Natural Gas Rules, 1989;
- The Forest (Conservation) Act, 1980;
- The Water (Prevention and Control of Pollution) Act, 1974;
- The Air (Prevention and Control of Pollution) Act, 1981;
- The Environment Protection Act, 1986, Rules there under (with amendments);
- Environmental Impact Assessment Notification, 2006;
- Public Insurance Liability (PIL) Act, 1995;
- The Factories Act, 1948;
- The Explosives Act 1984 and Rules 1993;
- Gas Cylinder Rules 1981;
- Coastal Regulation Zone Notification- 2011;
- Land Acquisition Act;
- Nation Rehabilitation & Resettlement Policy;
- Gujarat Rehabilitation & Resettlement Policy; and
- Any other Legislation pertaining to H & S;





**FIGURE-5**  
**PROCESS FLOW CHART – LNG TERMINAL**



**FIGURE-6**  
**PROCESS FLOW DIAGRAM OF LNG VAPORIZATION AND SEND-OUT FACILITIES**

## 5. Scope and Methodology

Vimta has been requested to conduct an Environmental & Social Compliance and provide an independent review of performance of the subject facility. A brief preliminary review has been conducted in coordination with the corporate project team at Delhi and a draft report has been prepared in view of the paucity of time.

This will follow a detailed site visit and audit of the existing facility with respect legislative frame work as described above. A comprehensive report on Environmental & Social Compliance will be submitted as follow-on of the present study

## 6. Verification Audit

This section presents findings based on preliminary review of the documents provided by PLL corporate project team at New Delhi. The results are presented in **Table-1** and this table describes the relevant environmental and/or social parameter which could be impacted by the operations of subject facility. There are some general aspects which relate to the Project and these are described in **Table-1**.

## 7. Conclusions

This report presents findings of a verification audit which is based on a review and conversations/ meetings with the Project team.

During the course of our review, no significant issues were noted that have affected the environmental and social status of the facility of PLL. Facility operations are being carried out in such a way that appropriate environmental and social mitigations were adopted. It has been noted that the subject facility has obtained all the required permits from Gujarat Pollution Control Board (GPCB) and is complying with the conditions mentioned there in. These permits are valid upto 15/3/2014. Further, it is also noted that all relevant social and environmental risks and potential impacts have been addressed while operating the existing plant.

The findings of this draft audit have been discussed with PLL's corporate project team at Delhi.

**TABLE-1**  
**COMPLIANCE REPORT STRUCTURE REQUIREMENTS**

Location	Parameter	The PLL Audit Discussion / Findings	PLL Mitigation Measures	Vimta Labs Findings and Comments
<b>General</b>	Grievance mechanism and Grievances received	<p>PLL's existing plant has been set up in an area of 48 Ha of GIDC land. No private land has been acquired and hence there was no displacement of habitation involved while setting up the plant.</p> <p>However, PLL has maintained cordial relation with the surrounding villages and regular meetings of PLL land, social and environmental team in the villages gave people in these villages an opportunity to express their concerns and ask questions.</p> <p>An open door policy will be maintained to all persons from the following:</p> <ul style="list-style-type: none"> <li>• Representatives of affected persons or the affected persons directly;</li> <li>• Representatives of the local governments or administration;</li> <li>• Workers; and</li> <li>• Members of the public with projects related questions or concerns</li> </ul>	<p>PLL has spent Rs. 8 crores towards Corporate Social Responsibility and peripheral development since the inception of the plant till 2011.</p> <p>The amount has been spent in villages Luvara, Lakhigam, Muler.</p> <p>PLL on its own and in co-operation with CODEGAZ, the CSR arm of GDF Suez, plan to do the welfare activities in the field of health, education, sanitation and such other welfare measures in and around the plant site.</p>	<p><b>No significant issues noted.</b></p> <p>The grievance register shall be set up at the project site for registering any grievances with respect to environmental and social issues, including:</p> <ul style="list-style-type: none"> <li>• Queries regarding pollution status, CSR activities,</li> <li>• Potential impacts of the Project, in particular related to local ecology and the seacoast</li> <li>• The potential to be offered employment.</li> </ul> <p>PLL shall identify staff who is assigned responsibility for administering the grievance mechanism which provides confidence that comments / grievances are likely to be logged and followed up.</p>



Location	Parameter	The PLL Audit Discussion / Findings	PLL Mitigation Measures	Vimta Labs Findings and Comments
	Stakeholder Engagement	<p>65% of the employees are Gujarati. Local villagers were given preference in employment depending on the skill levels. Many of the local villagers have obtained secondary employment due to the operations of the existing plant.</p> <p>As there are no common properties involved neither water drawl from any surface water body is involved. Hence, there would be no involvement of stakeholders.</p>	Meetings with stakeholders specifically regarding the LNG terminal.	<p><b>No significant issues noted.</b></p> <p>Public Information Centre shall be established to manage public communications in a face-to-face manner. Though its not a necessity in the absence of stakeholders, establishing Public Information Centre may boost the public image of PLL with respect to pollution control and socio-economic well being of surrounding villages.</p>
	Training of Labour	PLL is formally sponsoring the training of people from surrounding villages.	As part of CSR activities, PLL is sponsoring the development of ITI in the region.	<b>No significant issues noted.</b>
	Employment of local people on Project sites	<p>PLL employed 65% of Gujarati local people during construction and 2000 local people during operation phase of project.</p> <p>All employment contracts were written in line the Labour Code.</p> <p>Wherever possible, PLL adopted the Government policies e.g. all employees were at least 18 years old and suitable for the task being assigned to them.</p>	Incorporation of requirements similar to the Government within the employment contracts	<p><b>No significant issues noted.</b></p> <p>The use of locals to undertake construction activities within their capability is a requirement of the agreement to construct the Project.</p>
<b>Dahej</b>	Required land use	The necessary land was acquired from the GIDC.	Not applicable	<p><b>No significant issues noted.</b></p> <p>No physical displacement has been</p>

Location	Parameter	The PLL Audit Discussion / Findings	PLL Mitigation Measures	Vimta Labs Findings and Comments
		<p>No grazing land was taken for the LNG terminal in this area.</p> <p>No cropland was taken for the LNG terminal in this area.</p> <p>No physical displacement was necessary for the LNG terminal in this area.</p>		necessary as part of the LNG terminal in this area, plus no grazing land, cropland or any fruit trees were taken as part of the LNG terminal in this area.
	Applied compensation scheme and legislation for acquired land	Gujarat Industrial Development Corporation (GIDC) has allocated the required land as per terms and conditions for PLL Dahej.	Not applicable	<b>No significant issues noted.</b>
	Health and Safety at Construction Sites	PLL supervised and trained the employed along with contractors and personnel with international management in basic site safety and significant site hazards.	<p>A health and safety induction was given to all staff prior to commencement of the project.</p> <p>Issuing of personal protective equipment (PPE).</p> <p>Employment of a site supervisor</p>	<p><b>No significant issues noted.</b></p> <p>Vimta to review the various records, during the next site visit, pertaining to employing the local people local people employed on the site had attended and understood the health and safety induction, distribution of PPE, training on safety, the format of the Accident Investigation Report etc.</p>
	Affected Habitat – Critical Habitat	No critical habitat areas were recorded.	Not applicable	<p><b>No significant issues noted.</b></p> <p>No critical habitat areas were impacted in this location</p>
	Affected Habitat – Tree removal	Rs. 93.31 lakhs spent for development of Greenbelt/ Mangrove plantation during the year	Not applicable	<p><b>No significant issues noted.</b></p> <p>Extensive plantation was developed</p>

Location	Parameter	The PLL Audit Discussion / Findings	PLL Mitigation Measures	Vimta Labs Findings and Comments
		2011-2012.		<p>by PLL along the boundary.</p> <p>PLL has planted about 356 Ha with Mangrove plantation along various places on Gujarat Coast in association with Gujarat Ecology Commission</p>
	Pollution prevention and control	<p>The impacts on the various environmental attributes are mitigated using appropriate pollution control equipment. The Environment Management Plan has been prepared for the LNG terminal aims at minimizing the pollution at source.</p> <p>Fugitive and stack emissions from the LNG terminal were monitored. The ambient air quality and stack emissions found within permissible limit prescribed by CPCB/MoEF.</p> <p>There is no generation of any liquid effluent from the process area. The domestic sewage generated is routed to soak pits</p> <p>Noise generating equipments are designed to conform to noise levels prescribed by regulatory authorities. Acoustic barriers and shelters has been provided in noisy workplaces.</p>		<b>No significant issues noted.</b>

Location	Parameter	The PLL Audit Discussion / Findings	PLL Mitigation Measures	Vimta Labs Findings and Comments
		Personal Protective Equipments (PPE) such as earplugs, earmuffs to the workers working in high noise level area are provided by PLL.		
	Noise and Vibration Dust Site Traffic	The closest human dwellings are more than 1.5 km away and as a result experienced little or no disturbance in relation to noise / vibration, dust or site traffic.  PLL has commitment to participate in traffic control management plan, which is prepared by Gujarat Maritime Board.		<b>No significant issues noted.</b>  It was confirmed that there were no immediately apparent sensitive receptors within the vicinity of the plant.  Although impacts were considered to be unlikely (given the remote location of nearest sensitive receptors), the supervision approach represented an appropriate way of managing any impacts associated with noise / vibration, dust and site traffic.
	Solid Waste and Disposal	PLL is not generating of any non-hazardous or inert solid waste from the process of LNG terminal.  Approximately 3 KL/year of waste oil and 500 kg/year waste residue containing oil are being generating from the maintenance of LNG terminal. Hazardous waste is collected and stored at specific identified area at site.		<b>No significant issues noted.</b>  Construction materials used and associated waste streams will have been limited to the following;  <ul style="list-style-type: none"> <li>• Crushed rock</li> <li>• Excess membrane</li> <li>• Timber off-cuts</li> <li>• Packing materials (such as plastic)</li> <li>• General waste (food waste, plastic, tins, glass)</li> </ul>



Location	Parameter	The PLL Audit Discussion / Findings	PLL Mitigation Measures	Vimta Labs Findings and Comments
		Authorized agency is hired for the collection and disposal of Hazardous waste.		<p>Volumes generated are expected to have been relatively low. It is understood that waste generated was collected at the end of each working day and taken to local waste disposal facilities. There was no evidence of any refuse on the site during the site visit.</p> <p>All vehicle maintenance activities were undertaken by the transport contractors and therefore there was no oil / lubricant / fuel which needed to be disposed of or handled at the work site.</p>
	Coastal and Marine Ecology	There is no intake of seawater and out flow of water in the sea, hence it is felt that a marine ecology is not affecting.		<b>No significant issues noted.</b>