

Draft Environment and Social Compliance Audit

Project Number: 48307-001
July 2014

PAK: Engro Fast Track LNG Regasification Project

Prepared by Environmental Management Consultants (EMC) for Engro Elengy Terminal Private Limited

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EXECUTIVE SUMMARY

The Environmental and Social Compliance Audit of the following activities being undertaken at the proposed LNG Import Terminal Project to check ESIA compliance:

- Mangrove Removal
- Construction of Cofferdam
- Temporary Site Camp Construction

Audit team members of EMC visited the site on July 24, 2014 to conduct the audit.

The observations, findings of the activities are:

Mangrove removal

Mangrove removal is being carried out over an area of 41 ha and a program of replantation of mangroves on an area of 400 has been agreed with PQA authorities and IUCN.

Construction of Cofferdam

Construction of cofferdam is carried out for dumping of the dredged material. Sand is transported from designated sites to the area for filling. The cofferdam edges are being lined with geotextile material and the entire activity is managed with compliance of health and safety practices.

Temporary Site Camp Construction

The temporary camp site is being constructed inside the EVTL premises and EHS management plan is present for the construction campsite activities. A dedicated site EHS officer is present to monitor EHS compliance during the activities at the campsite. Regular trainings, Tool Box talks are conducted for the workers. All equipment is checked and certified by third party. Drivers and riggers are certified.

Recommendations:

Mangroves Replantation: It must be ensured that the replantation of the mangroves is carried out with a ratio of atleast 1:5 and the growth is monitored over a period of 3 years.

Dredged Material: When the dredging activity is carried out, the testing of the dredged material is to be carried out to check for presence of heavy metals.



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I. INTRODUCTION

Elengy Terminal Pakistan Limited (ETPL) was registered under the SECP Act 1997, in January 2012, and is a 100% owned subsidiary of Engro Corporation Pakistan to position Engro as a partner of choice with Key Stake holders. ETPL boasts of experience in terminal business due to its affiliation with Engro Vopak Terminal Limited, a joint venture of Engro Corporation (Pakistan) Limited (50%) and Royal Vopak of the Netherlands (50%).

ETPL intends to develop a 3.5 – 5 mtpa floating LNG terminal in the jurisdiction of Port Qasim which is a designated industrial zone. The project includes constructing and operating a Liquefied Natural Gas (LNG) terminal at Port Qasim, inclusive of ship berthing and import facilities, floating storage tanks and regasification equipment. The project intends to provide facilities for receiving supplies of LNG via a conventional LNG carrier, for offloading, transfer and loading into a Floating Storage and Regasification Unit (FSRU). The FSRU will store and re-gasify the LNG and deliver the regasified liquefied natural gas (RLNG) via jetty and onshore associated facilities to the gas network operated by the in-country transmission pipeline providers.

Dredging will be required to create the berthing basin. Dredged material will be utilized for the reclamation and to construct shore protection structure. The balance will be dumped at sites advised by PQA..

ETPL intends to follow a fast track approach towards developing the LNG import floating terminal in order to bridge the gap between supply and demand of energy. The Project is primarily based on developing the required infrastructure so that LNG can be brought into the Natural Gas (NG) market, which has witnessed phenomenal growth in the energy sector in Pakistan. In the first stage, the focus is on the fastest method to facilitate LNG flow into the NG pipeline network in Pakistan.

ETPL has received approval from Sindh EPA for the construction and Operation of LNG Import Terminal at Port Qasim against the ESIA submitted to the Sindh EPA.

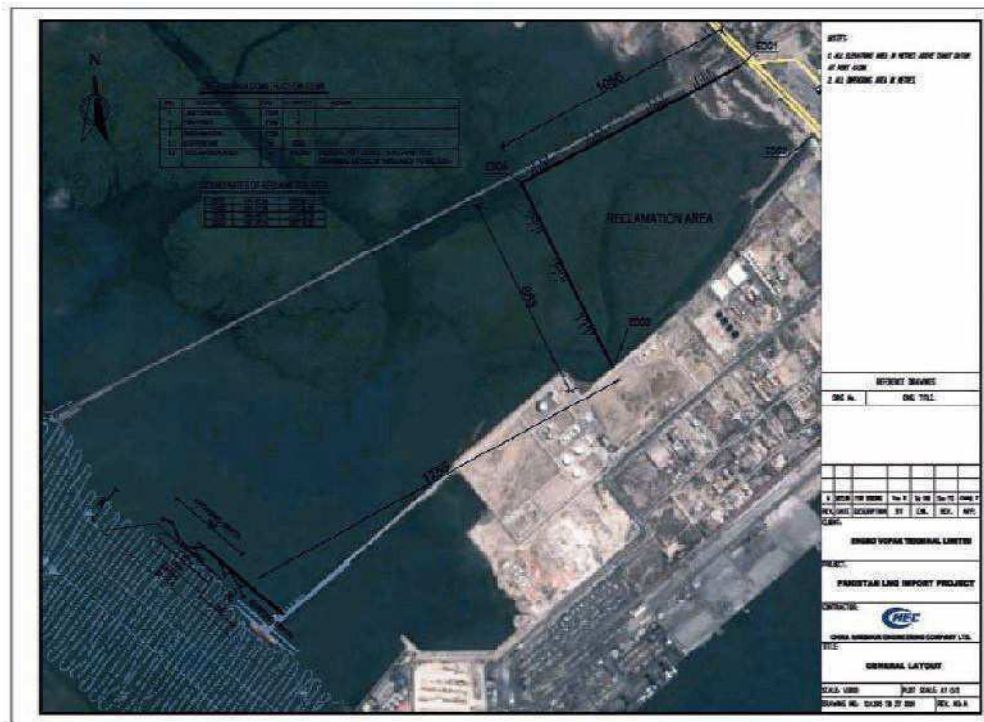


Fig 1.1: Location of Proposed LNG Terminal



Fig 1.2: Location of Reclamation area.

ETPL has acquired 41 Ha of an area for the dumping of the dredged seabed material. (Fig 1.2). The designated area of 41 Ha has mangrove plantation (tree height 2-3 m, population density of 6-8 per 100 m² stub counts). A cofferdam is being constructed at this reclamation area.

Mangrove removal is in progress and replantation of the mangroves at the PQA designated area under the aegis of IUCN shall be carried out under an agreement with all the parties. Replanting of the mangroves shall be carried out at areas identified by PQA and as per recommendation of the ESIA study..

A temporary site camp has been designated at the EVTL premises at 24° 46'39.5 Latitude N and 67° 19' 48.5 Longitude E for welding works and other activities related to the pipeline construction.



Fig 1.3: Location of Construction Camp

The job of construction of cofferdam and pipeline has been contracted out to M/s China Harbour with supervision of ETPL Project Staff.

II. LEGAL AND STATUTORY FRAMEWORK – ENVIRONMENTAL LAWS, REGULATIONS, AND STANDARDS

The proposed LNG Import Terminal is covered under the Pakistan Environmental Protection Act 1997 and after the 18th amendment the Sindh Environmental Protection Act 2014, EIA/IEE Regulations 2000.

The Sindh Environmental Protection Agency is the agency for drafting the environmental laws in the Province of Sindh and giving approval to projects.

The key environmental legislations pertaining to the proposed LNG Terminal Project include:

1) Pakistan Environmental Protection Act 1997

There are 33 sections in the PEP Act, 1997. Following are very important clauses pertinent to establishment of proposed LNG Project:

S.R.O. 339 (1)/2001 - In exercise of the powers referred in Section 33 of the PEPA 1997 (XXXIV of 1997), Pak - EPA has, with the approval of the Federal Government introduced "Pak-EPA (Review of IEE and EIA) Regulations, 2000.

Clause 14 - "Handling of Hazardous Substances" requires anyone who generates, collects, consigns, transports, treats, disposes of stores, handles hazardous material or imports any hazardous waste has to have a permit to do so from EPA.

Clause 16 - "Environmental Protection Order" permits EPA to enforce protection measures and remediation where contamination of the environment has taken place. Where an order is not carried out, FEPA has the authority to carry out the required works and to recover the costs from the person responsible for the source of environmental contamination.

Clause 18 - "Offences by Bodies Corporate" identifies individual responsibility and liability to prosecution where contravention of an Ordinance is committed by a body corporate. Accordingly powers of the Federal and Provincial EPAs have been enhanced and they have the powers to conduct enquiries into possible breaches of environmental laws either of their own accord, or upon filing a complaint.

Clause 30 - "Ordinance to over-ride other laws", takes precedence over other laws in effect at the time. Under this Act no project including construction activities or any change in the existing physical environment can commence unless the fulfilment of pre-requisite to IEE or EIA has been conducted and its approval obtained from the Responsible Authority, in the present case from Sindh EPA.

2) Sindh Environmental Protection Act 2014

Legislative assembly of Sindh province of Pakistan recently passed the bill on 24th February 2014 to enact Sindh Environmental Protection Act 2014. The Act envisages protection, improvement, conservation and rehabilitation of environment of Sindh with the help of legal action against polluters and green awakening of communities. It equally lays emphasis for the preservation of the natural resources of Sindh and to adopt ways and means for restoring the balance in its eco-system by avoiding all types of environmental hazards.

3) Salient Features of SEPA 2014

Section-11: No person shall discharge or emit or allow the discharge or emission of any effluent waste, pollutant, noise or adverse environmental effects in an amount, concentration or level which is in excess to that specified in Sindh Environmental Quality Standards.

Section-12 & 13: No person shall import hazardous waste into Sindh province and handle hazardous substances except under licenses etc.

Section 14: No person shall undertake any action which adversely affects environment or which lead to pollute or impairment of or damage to biodiversity, ecosystem, aesthetics or any damage to environment etc.

Section 15: This section deals with regulation of motor vehicles banning emission of air or noise pollutants being emitted from them in excess of allowable standards.

Section 17: This section states that no proponent of a project shall commence construction or operation unless he has filed with the Agency an initial environmental examination or environmental impact assessment and has obtained from Agency approval in respect thereof. SEPA shall review the IEE & EIA and accord approval subject to such terms and conditions as it may prescribe or require. The agency shall communicate within four (04) months its approval or otherwise from the date EIA is filed failing which the EIA shall deemed to have been approved.

Section 21: Where agency is satisfied that the discharge or emission has occurred in violation of any provision of this act or rules etc. then it may, after giving an opportunity to person responsible, by order direct such person to take such measures within specified period. The agency under this section has been empowered to immediately stop, prevent or minimize emission, disposal etc. for remedying adverse environmental effects.

Section 22: The person who fails to comply with section 11, 17, 18 and 21 shall be punishable with a fine which may extend to five million rupees, to the damage caused to environment and in the case of a continuing contravention or failure, with an additional fine which may extend to one hundred thousand rupees for every day during which such contravention or failure continues. And, where a person convicted

under sub-sections 1 & 2 had been previously convicted for any contravention of this Act, the Environmental Protection Tribunal (EPT) may, in addition to punishment, award imprisonment for a term that may extend up to three years, or order confiscation or closure of facility etc.

Section 23: Where any violation of this Act has been committed by any of employee of any corporate body, then, that employee shall be considered to be guilty of environmental pollution.

Section 25: This section allows for establishment of Environmental Protection Tribunals.

A. Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations 2000

The PEPA review of IEE and EIA regulations, 2000 (the 'regulations'), prepared by the PEPA under the powers conferred upon it by the Pakistan Environmental Protection Act, provide the necessary details on the preparation, submission and review of the IEE and the EIA.

B. National Environmental Quality Standards

The NEQS were first promulgated in 1993 and were last revised in 2000. They comprise the basic guidelines for liquid effluent and gaseous emissions of municipal and industrial origin to comply with. These standards present the maximum allowable concentration for liquid effluent before its discharge into sea, inland water & sewage (total 32 parameters to comply with) and gaseous emissions in the ambient air from industrial sources (total 16 parameters to comply with).

- Self-Monitoring & Reporting Rules 2001
- The Biodiversity Action Plan
- The Sindh Fisheries Ordinance 1980
- Antiquity Act 1975
- Sindh Cultural Heritage (Preservation) Act 1974
- Forest Act 1927
- Sindh Wildlife Protection (Second Amendment) Ordinance 2001
- Environmental and Social Guidelines
 - Guidelines for the Preparation and Review of Environmental Reports,
 - Guidelines for Public Consultation,
 - Guidelines for Sensitive and Critical Areas,
 - Sectoral Guidelines.
- Safeguard Policy Statement (2009) of ADB

Asian Development Bank's Safeguard Policy Statement (SPS) sets out the policy objectives, scope and triggers, and principles for three key safeguard areas and safeguard requirements are given in:

- i. Safeguard requirements 1: Environment,
- ii. Safeguard Requirements 2: Involuntary Resettlement,
- iii. Safeguard Requirements 3: Indigenous Peoples

C. IFC's Performance Standards

International Finance Corporation (IFC) applies the Performance Standards to manage social and environmental risks and impacts and to enhance development opportunities in its private sector financing in its member countries eligible for financing. The Performance Standards establish standards to be met throughout the life of an investment by IFC or other relevant financial institution. There are eight performance standards of IFC:

1. Social and Environmental Assessment and management System
2. Labour & working conditions
3. Pollution Prevention & Abatement
4. Community Health & Safety
5. Land Acquisition and Involuntary Settlement
6. Biodiversity Conservation and Sustainable Natural Resource Management
7. Indigenous People
8. Cultural Heritage

III. SITE AUDIT PROCEDURE

The compliance audit was conducted by site visit on 24th July 2014. The audit team members from EMC were:

1. Dr. Shahid Amjad, Marine Ecologist
2. Ms. Zulekha Soorma, HSE Advisor
3. Mr. Ather Adil, Sampling Officer

The following personnel from ETPL coordinated the site audit:

1. Mr. Faisal Shafeeq, Project Engineer
2. Mr. Syed Ammar Shah, Project Engineer
3. Mr. Hasan Arshad, Project Site Engineer

The audit team members were briefed on the present status of the areas to be audited to check ESIA compliance:

- Mangrove removal
- Cofferdam construction
- Temporary Camp Site Construction

Mr. Hasan Arshad escorted the audit team to above areas after providing safety shoes, hard hat and safety goggles

IV. AUDIT FINDINGS

1. Environment

- Environmental Assessment

1.1 Mangrove Removal

The designated area of 41 Ha area has mangrove plantation (tree height 2-3 m, population density of 6-8 per 100 m² stub counts). The mangrove species is pre-dominated by *Avicenna marina*. The mangroves inside the 41 ha area have been cut and are in the process of being removed from the site.



Fig 4.1: Mangroves removal in progress

Following are the observations:

1.1.1 Epifaunal Mangrove Communities

A general survey was carried out to evaluate the potential faunal species of the area. The epifauna is a link for the transfer of energy from lower trophic level to higher levels.



Fig 4.2: Pilot shrimp at site

After the removal of existing mangroves, fresh mangrove saplings will be replanted at the designated location provided by PQA under the supervision of IUCN. However, the replanted mangroves may take a longer time to re-establish the productive mangrove ecosystem. An overview of the species distribution and species diversity is given in Figure 1.

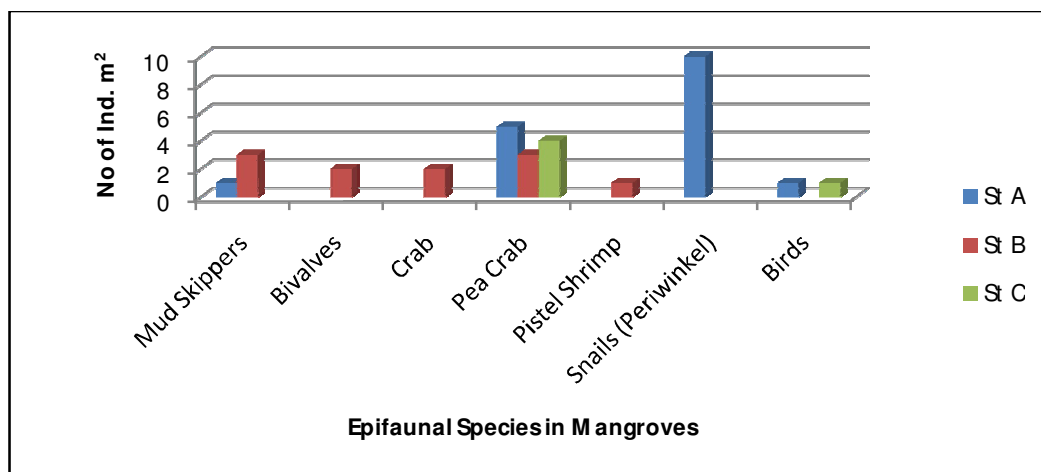


Fig 4.3: Epifaunal Species in Mangroves

Species	Variance	Mean	Chi-sq	d.f.	Aggregation
Mud Skippers	2.3333	1.3333	3.5	2	Random
Bivalves	1.3333	0.6667	4	2	Random
Crab	1.3333	0.6667	4	2	Random
Pea Crab	1	4	0.5	2	Random
Pistol Shrimp	0.3333	0.3333	2	2	Random
Snails (Periwinkle)	33.3333	3.3333	20	2	Aggregated
Birds	0.3333	0.6667	1	2	Random

Fig. 4.4: Distribution of the species

1.1.2 Shannon Wiener Diversity Index

Diversity is a tool for measuring the health of the ecosystem. Poor diversity values indicates a disturbed faunal community.

Index	St A	St B	St C
Shannon H' Log Base 10.	0.437	0.672	0.217
Shannon Hmax Log Base 10.	0.602	0.699	0.301
Shannon J'	0.725	0.961	0.722

Fig 4.5: Shannon Wiener Diversity Index

Anecdotal information regarding specific mammals was collected from the local contractor and labor force working in the area, relevant literature was also consulted. Carnivorous large mammal species - Jackal *Canis aureus* and Fox *Vulpes vulpes* are reported from the observed PQA area. Jackal *Canis aureus* is a very adaptable animal and is included in Appendix III of the CITES Species List and listed as Near Threatened in Pakistan's Mammals National Red List 2006.

No significant impact is expected on the terrestrial fauna at the proposed Project site and vicinity. This is because the Project site is located in a disturbed area and no terrestrial biodiversity of conservation importance has been reported from the area. The fish being fast swimmers will move away from the area to rejoin adjoining fish stocks in the area. None of the Marine or terrestrial species observed or reported along the coast of Port Qasim area are listed as critically endangered, endangered or near threatened by the IUCN Red List of Threatened Species Version 2014.1

Ref : UNEP-WCMC. 20 August 2013. UNEP-WCMC Species Database: CITES-Listed Species Status and Red List of Pakistan Mammals. 2006. Biodiversity Programme IUCN Pakistan

1.1.3 EHS Compliance

The labourers employed to remove the mangroves have been provided with long boots and they were using axes and small battery driven hacksaws to cut the mangroves. No other PPE like coveralls, gloves, safety glasses was provided. The mangroves cutting is carried out during low tide and all activities are carried out from morning till mid- day. The mangroves are manually loaded on to trucks and carted away pending disposal as agreed with PQA.

1.2 Cofferdam Construction

1.2.1 Cofferdam

The earthen Cofferdam is being constructed to contain the dredged sea bottom sediments. Initial filling of the cofferdam has been carried out and currently filling is being carried out to raise the elevation of the dam. The sand is brought to the site from PQA designated sites by the contractors and their entry and exit is checked by the PQA authorities.



Fig. 4.6: Cofferdam construction in progress

The dredge sediment in the cofferdam will raise the elevation of the site to over 5.3 m. The astronomical high tide in PQA is about 4.0m. The banks of the earthen cofferdam are being lined by Geo-textile material. The geo-textile material will protect the earthen embankments from erosion by high tidal currents, rain and erosion of sediments by wind. The life expectancy of the geo-textile is estimated to be about a year. The ETPL project team informed that the dredging operation shall be initiated by mid -August 2014



Fig 4.7: Lining of edges of the cofferdam

EHS Compliance

The movement of trucks loaded with sand and earth moving equipment is controlled and supervised by the Chinese contractors. High visibility jackets, hard hats, safety shoes, dust masks are used by the workers. Sprinkling of water to control the dust generated during offloading of the sand is carried out twice daily.

2. Social

(i) Land Acquisition and Resettlement Impacts

The project is located in designated industrial zone of Port Qasim Authority. There is no habitation in the area where the LNG terminal is being constructed or in the land reclamation area where the cofferdam is being constructed. No resettlement issues are involved.

(ii) Indigenous Peoples

The project is located in designated industrial zone of Port Qasim Authority. There were no communities living in the vicinity of the project area or carrying out subsistence activities within the project area. Fishing is banned in the vicinity of the industrial zone. Hence no impacts on indigenous people are envisaged due to the project related activities.

ETPL is engaging unskilled labour from the local population in the surrounding localities for the construction and mangrove removal activities.

3. Stakeholder Engagement

Engrohas been operating a Gas Terminal in this area for the past 16+ years (EVTL) and has always maintained a good working relationship with all the stakeholders.

Public consultation for the LNG project was carried out and scoping meetings and stakeholder consultation meetings were held at the time of the ESIA study of the proposed LNG Import terminal Project. A public hearing of the Project and an Experts Committee Meeting was also held under the aegis of the Sindh Environmental Protection Agency prior to the approval of the project.

1.3 Temporary Camp Site Construction

The temporary camp site construction is being undertaken within the boundary of the EVTL facility where an area has been walled off to provide facilities to the ETPL Project contractors M/s China Harbor to carry out welding and preparatory work for the pipeline construction and other project related activities. The area measuring 135 x 165 m has been cordoned off by a boundary wall and temporary cabins installed for use by project staff. The project staff's accommodation is arranged off site and food is provided by ETPL.

The location of the construction site is N24° 46' 39.5 E 67° 19' 48.5.



Fig 4.8: Temp. Camp Construction Site

1. Environment

- Environmental Assessment

1.3.1 Construction Camp Site

No trees were cut or cleared for the temporary camp construction. Tree plantation is planned to improve the aesthetics of the camp.

A comprehensive waste management plan is in place and waste will be collected and segregated in dedicated area and disposed off through approved waste management contractors.

A septic tank is being constructed for the storage of sewage from the toilet facilities being provided at the site. The sludge from the septic tank will be removed and disposed off through approved contractors.

Water is provided via tankers and an estimated 1500 gallons of water will be used at the site.

Electricity is provided via diesel generators. A dedicated diesel holding tank is being constructed for storage of diesel used in the equipment at the construction camp site. Currently the fuel is provided via tankers which arrive at site to fill the vehicle /equipment tanks.

1.3.2 EHS Compliance

Project EHS compliance Plan is in place and an HSE officer is present at site to check compliance. A total of 80 workers will be employed at the site. Orientation training is provided to all workers before they start work at the site. Tool box talks are held before start of work on specific topics.

All equipment at site is checked by third party and fitness certificates are present. All drivers and riggers are trained and have relevant licenses for operating the equipment.

Appropriate PPE is provided to the workers and usage is monitored. Safety signage is present at site.

The ETPL management conducts regular audits of the site and corrective actions are complied.

2. Social

Since the construction camp is located inside the premises of EVTL, no social compliance issues are present.

V. CORRECTIVE ACTION PLAN

Following is the action plan in the light of the audit findings:

Activity	Action	Responsibility
Mangrove Replantation at PQA designated site	a) The mangrove species is pre- dominated by <i>Avicenna marina</i> . In order to have diversity of mangrove species, inclusion of <i>Rhizophora</i> and other spp. when the replantation is carried out. b) It must be ensured that atleast five times the amount of mangroves removed are replanted and monitoring of the growth of the mangroves is carried out over a period of 3 years by IUCN.	ETPL Project Team in association with reputable third party NGO
Dredging	Testing of heavy metals in the dredged material to be carried out in order to ensure that the heavy	ETPL Project team

Activity	Action	Responsibility
	metals concentration complies with the acceptable guidelines	
EMP Compliance	A comprehensive monitoring plan is to be implemented for compliance of all the parameters in the Environmental Management & Monitoring Plan in the ESIA of the Project through third party Independent Monitoring Consultants (IMC).	ETPL Project Team & Independent Monitoring Consultant (IMC)

APPENDICES



Appendix – I







Site Photographs






Mangroves Removal

	
Cut Mangroves	Wood from cut mangroves
	
Cut Mangroves	Mangroves cutting in progress
	
Cut Mangroves	Mangroves being removed

Epifaunal Species at Project Site

	
Periwinkles (snails)	Carbs
	
Pistol Shrimp	Grey Heron
	
Pistol shrimps at site	Local stones and formations

Cofferdam Construction

	
<p>Trucks loaded with sand at site</p>	<p>Creek adjacent to site</p>
	
<p>Geo Textile material</p>	<p>Geo Textile material being lined at edges</p>
	
<p>Geo Textile material at edge of the cofferdam</p>	<p>Earth moving equipment in operation</p>

Temporary Construction Camp Site

	
<p>Construction Camp site</p>	<p>Area cordoned off at camp site</p>
	
<p>Equipment at Camp site</p>	<p>Crane at camp site</p>
	
<p>Office cabins at camp site</p>	<p>Audit team at camp site</p>

Appendix – II

PQA Coordinates for Reclamation Site



PORT QASIM AUTHORITY
(HYDROGRAPHIC DEPARTMENT)

No. PQA/CHYD/478/2004

Dated: 14th May, 2014

**SUB: FAST TRACK LNG IMPORT TERMINAL, SERVICES, STORAGE
& RE – GASIFICATION AT PQA:**

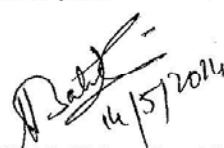
Ref: A. PSP letter No.PQA/Dir(PSP)/253/2009 dated 13th May, 2014.
B. Engro Elengy Terminal (Pvt.) Ltd letter Nil dated 09-05-2014 enclosing IUCN report.

Reference to engro elengy terminal letter referred above "B" the area bounded by the following geographical coordinates has been fixed for the dumping of dredged material of Engro Elengy Terminal site:-

- | | | |
|----|-----------------------|------------------------|
| a. | Lat. 24° 47' 20.40" N | Long. 67° 19' 59.46" E |
| b. | Lat 24° 47' 09.45" N | Long. 67° 20' 11.71" E |
| c. | Lat 24° 47' 10.00" N | Long. 67° 19' 36.11" E |
| d. | Lat 24° 46' 47.86" N | Long. 67° 19' 49.28" E |

2. The dredged material shall be ensured to be dumped in the site / bounded by the above coordinates and cofferdam to be built as per define "Method Statement" and to maintain in such a way that no dredged material should flushed backed to the adjacent creek or navigational channel.

3. Restoration of the Mangroves Eco system must be preserved in collaboration of IUCN Report.


CHIEF HYDROGRAPHER

Director (PSP)

Copy to:

1. D.G. (Technical)
2. Director (C.D.)
- ✓ 3. M/s. Engro Elengy Terminal