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# ENERGY POLICY PROGRAM

## ENVIRONMENTAL DOCUMENTATION FORM / ENVIRONMENTAL MITIGATION AND MONITORING PLAN – LNG ACTIVITIES



April 2014

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# Acronyms

\$	US Dollar
AEAI	Advanced Engineering Associates International
CFR	Code for Federal Regulation
CoP	Chief of Party
EDF	Environment Documentation Form
EIA	Environmental Impact Assessment
EMMP	Environmental Mitigation and Monitoring Plan
EPA	Environmental Protection Agency
EPP	Energy Policy Program
ERR	Environmental Review Report
ETPL	Elengy Terminal Pvt. Ltd.
GOP	Government of Pakistan
HSE	Health Safety and Environment
IEE	Initial Environmental Examination
MPNR	Ministry of Petroleum and Natural Resources
NDC	Negative Determination with Condition
NEQS	National Environmental Quality Slandered
O&M	Operations and Maintenance
OHS	Occupational Health and Safety
PEPA	Pakistan Environmental Protection Act
PERSUAP	Pesticide Evaluation Report and Safer Use Action Plan
PQA	Port Qasim Authority
SSGC	Sui Southern Gas Company
SWM	Solid Waste Management
ToR	Term of Reference
USAID	United States Agency for International Development
USG	Government of United States of America

# Environmental Documentation Form

## Energy Policy Program (EPP)

*Activity: LNG Activities under EPP*

### Applicant Information

Contractor /Grantee (organization)	AEAI-EPP	Parent Grant or Project	Energy Policy Program (EPP)
Individual Contact and Title	Mr. Talha Javed, (Acting COP)	Address, phone and email: House # 04, Street # 88, G-6/3, Islamabad +92 51- 8357072, <a href="mailto:tjaved@ep-ep.com.pk">tjaved@ep-ep.com.pk</a>	
Activity (Brief Description)	<p>Pakistan is facing gas shortages. Local production is 4,200 MMCFD against a demand exceeding 6,000 MMCFD. LNG imports offer a fast-track option to mitigate gas shortages over a period of 1.5 – 2 years.</p> <p>At the request of the Government of Pakistan (GOP), the Government of the United States of America (USG), through the United States Agency for International Development (USAID), agreed to provide technical advisory services to the GOP and nominated public sector entities that cover technical, commercial and legal consulting. These areas cover the entire LNG supply chain and are reflected in a broad-based Terms of Reference (TORs). One component of this effort is the “Fast-Track LNG Project,” which will facilitate a tolling agreement with a private sector LNG developer responsible for building and operating the country’s first LNG terminal. The anticipated terminal will be capable of processing up to 400 MMCF/day of GOP-procured LNG. The first gas delivery to SSGC’s distribution network is expected by the end of 2014. As a major energy infrastructure project, successful implementation involves several key actors. They include: the private sector developer; the Ministry of Petroleum and Natural Resources (MPNR); the Ministry of Ports and Shipping; the Inter-State Gas Systems (Pvt.) Ltd. (GOP coordinator); SSGC (the gas provider); and the Port Qasim Authority (PQA) (the port operator). The following list outlines the activities identified for USAID funding under EPP’s LNG Component:</p> <ul style="list-style-type: none"> <li>Specialized services in developing an LNG supply chain for MPNR</li> </ul>		Amount: <b>USD 1,954,875</b>
Location of Activity:	<b>Karachi and Islamabad, Pakistan</b>	Start and End Date of Activity	<b>Dec. 2012 – Oct. 2015</b>

**A. Activities, Screening Results, and Recommended Determination**

Proposed Sub-activities	Screening Result			Recommended Determinations (Complete for all moderate and high-risk activities)		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	With specified mitigation, no significant adverse impact,	Significant Adverse impact
1. Advisory Services	√			√		
2. Technical Assistance	√			√		
3. Specialize Services in developing a LNG supply chain for MPNR		√			√	

**B. Summary of Recommended Determinations**

The activity contains:	<i>(equivalent regulation 216 terminology)</i>
<input checked="" type="checkbox"/> Very low risk sub-activities.	1. Advisory Services. 2. Technical Assistance. Categorical exclusion per 22 CFR 216.2 c (1)(i) and (c)(2)(i).
<input type="checkbox"/> After environmental review, sub-activities determined to have <b>no significant adverse impacts</b> .	<i>Negative determination(s).</i>
<input checked="" type="checkbox"/> After environmental review, sub-activities determined to have <b>no significant adverse impacts, given appropriate mitigation and monitoring</b> .	1. Specialize services in developing a LNG supply chain for MPNR. Negative determination(s) with conditions per 22 CFR 216.3 (a)(2)(iii).
<input type="checkbox"/> After environmental review, sub-activities determined to have <b>significant adverse impacts</b> .	<i>Positive determination(s).</i>

**Confidential information redacted**

# 1. Introduction

In 2006, Pakistan developed its first LNG Policy which envisioned the private sector implementing LNG import projects with some government incentives. Between 2006 and 2010, there were two failed attempts to import and deliver LNG:

1. An integrated project with the private sector importing LNG, and building a terminal to process and deliver gas to Sui Southern Gas Company's (SSGC's) distribution network; and
2. An unbundled approach with one entity providing gas and another providing a terminal for gas processing and delivery to SSGC.

A 2010 Supreme Court Stay Order effectively ended these projects. Consequently, in 2011, a new LNG Policy was promulgated to expedite project implementation. Further attempts in 2012 and 2013 were stalled. A new integrated project (supported by USAID) was effectively abandoned in light of a Supreme Court ruling. A tender for the retrofit of a GOP LPG terminal has been awaiting GOP approval since September 2013. In July 2013, the government initiated a new strategy to import LNG on a "fast-track" basis (under the unbundled structure), with tendering beginning in August of 2013. These activities are being implemented by the USAID Energy Policy Program (EPP).

This document represents the Environmental Mitigation and Monitoring Plan (EMMP) for EPP's LNG activities. The EMMP has been developed by EPP's Environmental and Program Teams.

## 1.1 "Fast-Track" LNG Import Project

The "Fast-Track" LNG import project ("Fast-Track") is supported under the USAID-funded EPP. Under the "Fast-Track" project, a private sector entity will build and operate the country's first LNG terminal, capable of processing up to 400 MMCF/day of GOP-procured LNG. The first gas delivery to SSGC's distribution network is expected by end of 2014. As a major energy infrastructure-related project, successful implementation involves several key actors. They include: (the private sector developer; two GOP Ministries, the Ministry of Petroleum and Natural Resources; and the Ministry of Ports and Shipping; and three distinct GOP counterparts: the Inter-State Gas Systems (Pvt.) Ltd., (GOP coordinator); SSGC (the gas provider), and the Port Qasim Authority (PQA), (the port operator). The project timeline is presented, in Figure 1 below.

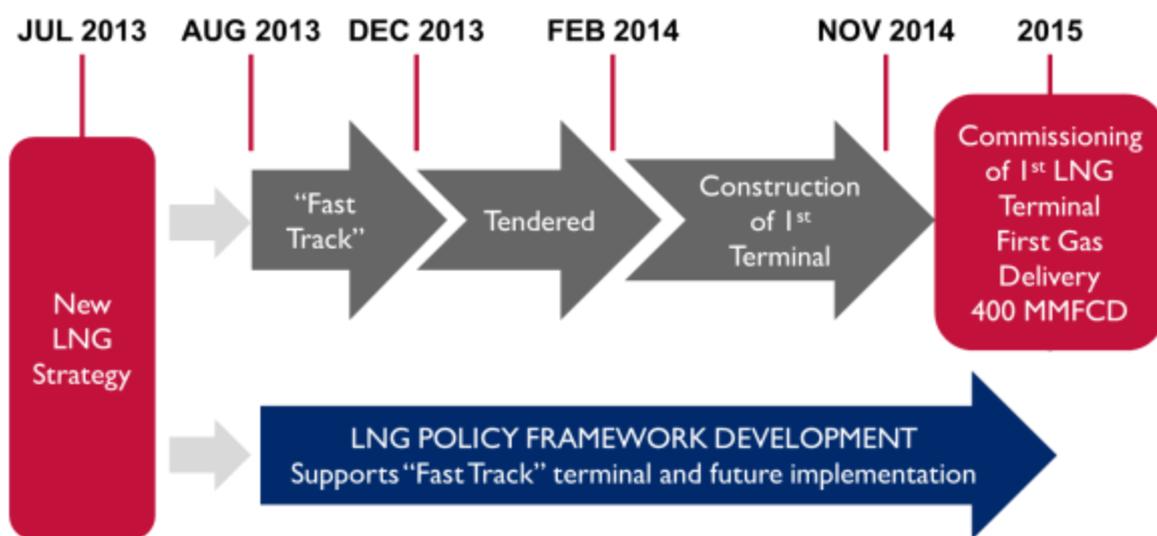


Figure 1: Timeline for Fast Track LNG Project

## 1.2 Expected Outcomes

With USAID support, the “Fast-Track” terminal is expected to deliver 400 MMCF/day of gas once it is fully operational in 2015; and will establish the enabling environment for additional LNG terminals. The increased availability of gas will help improve Pakistan’s energy security challenges, and offer the opportunity to reduce the country’s current gas shortfall in the immediate to mid-term. If made available and used in modern, high efficiency gas turbines for power generation, the gas could provide an additional 2,200 MW of generating capacity.

### Program Objective/Scope

The objective of this activity is to provide technical, commercial and legal support to the GOP’s select agencies (SSGC, ISGS, PQA). Services will be provided via local and international consultants who will cover the full LNG supply chain. The program is guided by broad TORs, while specific program elements are implemented in accordance with guidelines developed by the GOP. This support is provided by EPP at the GOP’s request.

The entire program, described in detail below, is guided by GOP procurement policies. As such, the construction and operation of the LNG terminal requires certain permits, licenses and agreements; which in turn require approvals and associated studies. The consultants provided by EPP serve in an advisory capacity, reviewing QRAs conducted by LNG developers and PQA. The final approval mechanism is led by GOP-nominated agencies.

A summary of the “Fast Track” program is given below:

- The “Fast Track” Program (ongoing since August 2013): Tender process, which includes competitive bidding for design, development and operation of SSGCL's LPG terminal facility for LNG imports:
  - Tolling terminal to be commissioned by the end of 2014.
  - TA covered RFP, technical and commercial evaluations of proposals, award to selected bidder, and development of a LNG Services Agreement (LSA) between SSGCL and the selected bidder, which has been finalized and initialed by both parties.
  - Immediate next steps include LSA execution, site confirmation for the terminal, implementation agreement between PQA and the selected bidder, and other approvals/agreements.
  - Terminal construction (ground breaking) is expected shortly thereafter; with the first delivery of gas expected during 2015.
- PQA Support (ongoing since December 2013): Technical advisory services and implementation support will be delivered to PQA:
  - Approvals and immediate next steps required for “Fast Track” Program
  - Site confirmation
  - Implementation Agreement (IA) between PQA and LNG developer,
  - Port regulations and operations (Traffic and Navigational) and
  - Advice on tug fleet, onshore infrastructure, and reports and studies

## 1.3 Structure of Report

This EMMP reviews information on existing environmental attributes of the study area. Geological, hydrological and ecological features, air quality, noise, water quality, soils, social and economic aspects and cultural resources are included. This report predicts the probable impacts on the environment due to proposed subproject enhancement and expansion. This Environmental Review Report (ERR) also proposes various environmental management measures. Details of all background environmental quality, environmental impact/pollutant generating activities, pollution sources, predicted environmental quality and related aspects are provided in this report.

## 1.4 Diary of Activities

Below is a brief description of the work plan for this assignment:

*Document Review:* At the start of the assignment, the Environmental Team requested all relevant documents from the concerned departments. The available documents were reviewed by the team, and from this review, potential environmental, social, waste disposal, and occupational safety issues at each site were identified.

*Site Visit:* Visits to the proposed terminal site at Port Qasim Authority (PQA) and Sui Southern Gas Company (SSGC) were conducted in March 2014. The activities undertaken during the visits include:

- Meetings with PQA, Engro, Sindh EPA, Environmental Management Consultants and SSGC staff, including:
  - Cdr. Mansoob Ali Khan, Director (Private sector projects) in PQA.
  - Mr. Faisal Shafiq, Planning & Contracts Manger in Engro.
  - Mr. Naeem Ahmed Mughal, Director General in Sindh EPA.
  - Mr. Azam Akhtar, Deputy General Manager in SSGC.
  - Mr. Noor A. Memon, Chief Engineer in SSGC.
  - Mr. Syed Nadeem Arif, Managing Consultant in EMC.
- Tour of the proposed LNG terminal site of VOPAK/ETPL at Port Qasim, and the proposed route of the transmission line to inspect all the sites where dredging and construction work will be carried out.
- General review of the existing site conditions and Occupational Health and Safety (OHS) practices.
- Review of the detailed plans for the proposed design and construction activities.

*Waste Management Plan:* The existing practices of environmentally sound waste management and safe disposal of old equipment and spares was a particular focus of the study. During the site visit, an inventory of the waste generated during the rehabilitation and repair activities was compiled. There is a designated waste disposal site in the Port Qasim area.

*Preparation of EMMP:* Following the visit, the team prepared the EMMP.

EPP's team visited the PQA terminals and the proposed route of the transmission line for the gas supply and tie-in points, specifically where the dredging and construction work will be carried out. EPP will provide technical and legal support to the GOP's nominated agencies (SSGC, ISGS, PQA) through the services of local and international consultants.

During the visit, the team reviewed the existing site conditions, measures adopted to mitigate environmental impacts, OHS practices, and the associated operational procedures for the site's operation.

Based on the field visit and a desk review, the EMMP was developed and completed.

## 1.5 Study Team

The study team included the following EPP experts:

1. Mr. Sadaf Iqbal, Environmental Expert and Team Leader.
2. Mr. Munir Ahmed, Energy Policy and Program Specialist (Support).
3. Mr. Tahawar Hussain, Policy Advisor (Support).

## 2. Policy and Statutory Requirements

### 2.1 Legislative and Regulatory Framework

#### 2.1.1 National Requirements

The “Fast Track” Program will comply with following regulatory and other requirements of the Government of Pakistan:

1. Pakistan Environmental Protection Act, 1997 <http://www.environment.gov.pk/act-rules/Brief-PEPA-Act1997.pdf>.
2. National Quality Standards Regulation, 2000 <http://www.environment.gov.pk/NEQS/neqs2000.pdf> .
3. Self-Monitoring and Reporting by Industry Rule, 2001 [http://www.environment.gov.pk/NEQS/selfmon\\_ru01.pdf](http://www.environment.gov.pk/NEQS/selfmon_ru01.pdf) .
4. Pakistan IEE/EIA Regulation, 2000 <http://www.environment.gov.pk/act-rules/IEE-EIA-REG.pdf>.
5. Hazardous Substances Rules, 2003 [http://www.environment.gov.pk/pro\\_pdf/HAZ-RU03.pdf](http://www.environment.gov.pk/pro_pdf/HAZ-RU03.pdf).
6. Draft Guidelines for Solid Waste Management, 2005 <http://www.environment.gov.pk/EA-GLines/SWMGLinesDraft.pdf>.
7. Environmental, Health, and Safety General Guidelines [http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui\\_EHSGuidelines2007\\_GeneralEHS/\\$FILE/Final+-+General+EHS+Guidelines.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/$FILE/Final+-+General+EHS+Guidelines.pdf).
8. Port Qasim Authority Act, 2002.
9. Forest Act 1927.
10. Ports Act 1908 and Pakistan Territorial Waters and Maritime Zone.
11. LNG Policy 2011 of GOP.
12. Maritime Policy of Pakistan 2002.
13. National Conservation Strategy 1992.
14. Biodiversity Action Plan.
15. National Fire Protection Association.

The Pakistan Environmental Protection Act of 1997 requires that initial environmental examinations or environmental impact assessments shall be carried out for every ‘project’. The types of projects for which the requirement is applicable are listed in the *Pakistan Environmental Protection Agency Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Procedures 2000*. Section 12 of the Pakistan Environmental Protection Act (PEPA) 1997 states that any project involving construction activities or any change in the physical environment is subject to compliance with Pakistan’s Environmental Protection Agency requirements, as implemented by the Sindh Environmental Protection Agency (SEPA). According to the PEPA Review of IEE/EIA Regulations 2000, the VOPAK/ETPL project falls under Schedule II, “Port and Development involving gross ship displacements greater than 500 tons.”

In compliance with these requirements, VOPAK / ETPL conducted a full environmental impact assessment (EIA) for the project, which was submitted to the Sindh EPA. The Sindh EPA approved the project in 2011. Subsequently, VOPAK / ETPL applied for and received a fresh NOC from the Sindh EPA in 2014.

## 2.1.2 United States Requirements

United States laws require that all activities financed by USAID shall comply with the requirements of the U.S. Law 22 Code for Federal Regulation (CFR) 216. The IEE for the proposed activities (see Annex I) were prepared by USAID in compliance with this requirement. The environmental mitigation and monitoring plan is a key tool in implementing the recommendations of the IEE.

To promote pesticide safety, USAID environmental regulations require that for any pesticide, or any chemical that can also be used as pesticide, a Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) shall be prepared. USAID has prepared a program-level PERSUAP for its activities in Pakistan. It is unlikely that the project will require any chemical that is regulated by PERSUAP. If any chemical required by the project falls into this regulated category, management of LNG shall inform USAID.

Per the Approved USAID IEE (OAPA Tracking #: OAPA-13-Nov-PAK-0003) has set the following environmental compliance result 1) Categorical exclusions per 22 CFR 216.2 (C) (2) (i) and 2) Negative Determination with Condition per 22 CFR 216.3 (a) (2) (iii). According to approved IEE an EDF shall be prepared for the activity, EDF is include the Environmental Mitigation and Monitoring Plan (EMMP), this EDF has to be approved by the A/COR and MEO/DMEO.

### 2.1.2.1 Categorical Exclusion

Per the Categorical Exclusions clause of 22 CFR 216.2 (C) (2) (i) the team has determined that the proposed activity does not have an effect on the natural and physical environment (e.g. research activities, education, technical assistance, training programs, controlled experimentation, analysis, research workshops and meetings, documents and information transfers).

### 2.1.2.2 Negative Determination with Condition

Per the Negative Determination with Condition clause of 22 CFR 216.3 (a) (2) (iii), a Positive Threshold Decision shall result from a finding that the proposed action will have a significant effect on the environment. An Environmental Impact Statement shall be prepared if required pursuant to section 216.7. If an impact statement is not required, an Environmental Assessment will be prepared in accordance with section 216.6. The cognizant Bureau or Office will record a Negative Determination if the proposed action will not have a significant effect on the environment.

## 2.1.3 Best Industry Practices for Environmentally Sound Design

The Implementer shall ensure that:

1. All activities including repair and replacement activities will be implemented in accordance with the Pakistani environmental OHS, regulations, standards, norms and guidelines and national obligations under ratified international environmental agreements ([see: http://www.environment.gov.pk](http://www.environment.gov.pk)); and in their absence in accordance with the best international practice appropriate to the seismicity levels in Pakistan and in the respective districts. These should be acceptable to USAID.
2. Asia Environmental Guideline at, <http://www.usaid.gov/our-work/environment/compliance/ane/guidelines.htm>.
3. IFC Environmental, Health and Safety Guidelines as provided [http://www.ifc.org/ifcext/sustainability.nsf/Content/Environmental\\_Guidelines](http://www.ifc.org/ifcext/sustainability.nsf/Content/Environmental_Guidelines).
4. World Bank 1999 Pollution Prevention and Abatement Handbook as provided at <http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=EI418751O&searchMenuPK=64187283&siteName=WDS&entityID=000094946990409050152283>.
5. EBRD Sub-sectorial Environmental and Social Guidelines <http://www.ebrd.com/about/policies/enviro/sectoral/>.

6. ADB Environmental Guidelines <http://www.adb.org/Water/CFWS/Roadmap-Sectoral-Guidelines.pdf>.
7. World Bank Environmental Assessment Handbook and Updates  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTENVASS/0,,contentMDK:20282864-pagePK:148956-piPK:216618theSitePK:407988,00.html>.

## 3. Description of the Environment

General characteristics of project area are under:

### 3.1 Physical Resources

#### 3.1.1 Topography, Geography, Geology, and Soils

Per the Geological Survey of Pakistan, the project site and its adjoining areas belong to the middle and upper tertiary formations which are “fresh” and slightly weathered compared to recent and sub-recent shoreline deposits. These deposits derive from the Gaj/Manchar formations of the lower Miocene to the Middle Miocene/Upper Miocene to the Pliocene Ages. The Gaj formation consists primarily of limestone with subordinate shale and sandstone. The limestone is sandy and extremely fossiliferous. This formation overlaps Nari, which consists of harder limestone beds and shale.

#### 3.1.2 Climate

The climatic condition of Port Qasim and the surrounding area is moderated by the sea. Temperature and rainfall are comparable to Karachi City. Temperatures occasionally exceed 40 degrees C. during the summer months, and fall to 10 degrees C. in the winter. In general, the relative humidity is approximately 60-65%, while wind speeds range from 1 to 10 m/s.

#### 3.1.3 Ambient air quality

Ambient air quality monitoring conducted by SUPARCO at the project site indicates concentration of all major pollutants, including NO<sub>x</sub>, SO<sub>2</sub>, CO, and PM<sub>10</sub>. Noise levels are within the IFC-established limits.

#### 3.1.4 Seismicity

Pakistan’s Unified Building Code has categorized Karachi and the adjoining area as 2B zoning, as has the Geological Survey of Pakistan.

#### 3.1.5 Flora and Fauna

Terrestrial flora is rarely found in and near the site area due to a lack of fresh water. The presence of saline or brackish water supports vegetation such as mangroves and other marine flora. Clusters of mangroves were identified in the project area. *Avicenna marina* is the abundant and dominant species of mangroves present in the area. Published records indicate the presence of juvenile shrimp and fish in the Korangi Creek area. There are no endangered species within the limits of the project site. The marine environment near the site area between the shoreline and Kadiro Creek is highly degraded. The creek has lost most of its biodiversity due to industrial and agricultural pollution entering the creek system near PQA. High saline values due to excessive diversion and overuse of the Indus River, which seldom now flows to the sea, has also contributed to the degradation of biodiversity. As such, most of the marine flora and fauna in the project area, including the mangroves, are stressed.

#### 3.1.6 Land Use and Development

PQA has administrative control over the 4,900 hectares of land above the water line, and 64,000 hectares of mangrove forests, mud flats and creeks. Major land use in the PQA area includes industrial facilities and typical port features. Installations of the Fauji Oil Terminal Company (FOTCO) are 10-12 km from the proposed LNG terminal. Several companies involved with the import and storage of molasses operate on a 70 hectare facility roughly 5 km to the east of the project area.

## 3.2 Socioeconomic Profile of the Project Area

Socioeconomic studies have been carried out through direct observations and semi-structured interviews. Three target areas were identified and include: the small settlements of Goth Ali Mohammad; Rehdi Goth; and housing facilities for staff of the Korangi fish harbor and small boat building in the area of the Korangi fish harbor. Goth Ali Mohammad is about 1 km to the northwest of the project site, while Rehdi Goth is about 3 km east of the proposed LNG land terminal. Goth Ali Mohammad is 4 km to the northeast and Rehdi Goth is 3 km to the north of LNG jetty.

The total population of the study area is between 25,000 and 30,000; although no one lives within 3 km of the LNG jetty or within 1 km from the onshore pipeline interconnection terminal. Most people in the study area are dependent on fishing in and around the shore waters. The remaining inhabitants are largely day laborers, self-employed, or service workers, with very few operating businesses. The socioeconomic status of the locals is very basic, with few amenities.

The literacy percentage in the affected villages throughout the study area is approximately 12%. The most significant environmental issues in these settlements are lack of sanitation and health facilities.

There is no group of people in the area of the project who are indigenous nor socially nor culturally distinct from the existing dominant culture; nor is the project expected to cause displacement of any segment of the population. Some members of the local population, especially local fishermen, may be affected by the project; as transient environmental issues such as dredging may temporarily affect their lifestyle and livelihood.

### 3.2.1 Local Community Impact Mitigation

The project will have limited impact on the local community. The project has committed to a programmatic and on-going system to identify, evaluate and compensate for any loss of livelihood, loss of assets, or similar impacts suffered by anyone using or living in the project area. The project has adopted a system of community outreach to initiate dialogue with the local community on project activities, and inform them on how to file grievances. There is also an effort to provide jobs and economic opportunities for local residents. As an example of the project's commitment to the local community, the LNG jetty has undertaken a study to determine the fishing pressure from local fisherman in the project area. The study will detail how much usage the area receives, to fully assess impacts that result from project activities; and to provide compensation for those impacted by the project. As a result of the outreach program, a local community advocacy organization will be consulted on all studies and programs related to fishing in the local area.

### 3.2.2 Project Siting

A number of different sites under PQA's jurisdiction were examined in the Port Qasim area for locating the proposed LNG terminal.

PQA provided guidelines based on its mission to develop the port facility in an efficient and environmentally benign manner. PQA and VOPAK / ETPL both agreed, based on the particular requirements of PQA and the project, to recommend the site on the Kadiro-Korangi Creek. The following was taken into account while selecting the recommended location for the LNG terminal:

1. Siting of the LNG terminal in sheltered locations, away from other industrial, commercial and populated areas.
2. The location was chosen to reduce the risk of passing ships impacting the berthed FSRU and LNG transport vessels.
3. Placing the terminal in a position that reduces the possibility of large ships passing near the jetty.
4. Providing an adequate backup area for maneuvering LNG transport ships. Stringent international practices impose safety and security exclusion zones around LNG vessels while in transit and during the berthing process. These zones are astern, ahead and on either side of the vessel. The

following LNG safety and security zones are applied by U.S., European and Far Eastern LNG terminals.

### 3.2.3 Other Safety Considerations

The location of the jetty is in a sheltered area away from other port users. Other ships do not pose a collision risk, and the release of LNG or gas vapor will not affect the local community. LNG is quite safe to handle under normal circumstances, and as is not stored under pressure. It is not explosive. Only upon release and conversion to a vaporized form is it potentially explosive. Even that is rare and almost unheard of. International standards suggest that there is a minimal risk of fire or explosion to anyone or anything located beyond 1.6 km from the source of an LNG derived explosion. While no one lives within the range of concern (nearest inhabitants are approximately 3 km away), the project has undertaken a Hazard Identification Program. The major settlements, habitations, industrial and commercial facilities in the study area are all outside of the safety and security zones for LNG terminals as recommended by PQA and international guidelines, including SIGTTO.

### 3.2.4 Ambient Noise Levels

The LNG terminal construction and associated activities may have an impact on ambient noise levels. In particular, work such as pile driving, dredging, drilling and earthworks, as well as plant noise from compressors and similar machinery, may contribute to noise. The duration of the construction work is not expected to exceed 18 months; and the potential impacts will be moderated due to a lack of residential, industrial or commercial areas close to the project.

Onsite noise levels during the construction phase will not exceed the average levels of 85 dB(A) at 7.5m. Ear plugs will be provided to construction workers as a protective measure.

Other activities during construction that can be a source of noise are the movement and operation of heavy construction equipment, excavation and fill operations for grading, pipeline cutting, welding, and installation. The noise will be confined to the surrounding areas, and the impact will be temporary.

LNG cargo unloading, storage and regasification are low-impact activities. Noise emissions during project operation are expected to be much lower and generally derived from pumps, engines, other on-site machinery, and from marine vessels unloading LNG at the jetty. The power generators and electric supply units are enclosed in the FSRU, and would not be a significant source of noise.

### 3.2.5 Air Quality

Construction and subsequent operation of the project is expected to produce emissions into the atmosphere that may affect air quality. The effects on air quality are likely to commence during construction from dust generated at the onshore construction site; and during operation from fugitive emissions of natural gas from venting and accidental leakage.

The main impact of fugitive emissions of dust is a nuisance, mainly caused by certain construction activities.

Emissions from construction equipment are another source of pollution. The air contaminants emitted during construction may include nitrogen oxides and carbon monoxide due to operation of construction equipment. However, their significance is low, as these emissions are very limited and are rapidly dispersed due high wind velocity on the shores.

Normal project operations, including LNG storage, vaporizers used in regasification, marine vessels and vehicle traffic, will also generate fugitive emissions of natural gas, methane, particulate matter, combustion gases and GHGs (primarily carbon dioxide). Air modeling under various scenarios suggests that in case of accidental release of LNG vapor, the impact would be insignificant.

Adequate and proper maintenance of all pumps, valves and pipelines must be ensured to limit any fugitive natural gas emissions within acceptable limits.

The steam/electric power plant onboard the FSRU will produce about 220,000 tons/year of CO<sub>2</sub>, a recognized greenhouse gas. On the other hand, substituting RLNG for RFO as boiler fuel yields improved air quality, well beyond the modest additional contribution to background CO<sub>2</sub> levels from the FSRU power plant.

### 3.2.6 Maritime Navigation

During construction of the LNG jetty, there may be occasional impacts on navigation that may affect the maneuverability of the floating construction equipment (piling barges). This will be coordinated with PQA to minimize disruption. As the proposed jetty is located at the convergence of Kadero and Phitti Creeks, obstruction to shipping during routine construction operations should be minimal.

No anticipated impact on navigation in the main channel of the port is expected during project operations. The Port Authority will regulate the traffic channel, so no mitigation measures are required.

### 3.2.7 Geomorphology and Hydrogeology

Dredging of the approach channel, the turning basin, the berthing pocket, and disposal of spoil in the site area will result in a temporary negative impact on the channel geomorphology. This, however, will be transitory and relatively insignificant. The site is located in a seismically moderate hazard zone, designated as 2B; and the design of the anticipated facilities will accommodate for this.

Dredging associated with the project will create approximately 3.0 million cubic meters of spoil material that will be disposed of behind a 3.5km cofferdam. The resulting fill material will eventually create usable land adjacent to the existing shore line, approximately 4.5 km west of the jetty location. During construction of the cofferdam, barges will undertake construction activities, thereby minimally affecting local turbidity. Upon completion, the dam will receive a synthetic liner to reduce or eliminate the passage of sediments from spoils placed behind the dam. The impact of placing spoils behind the cofferdam is considered minimal, as the spoil material is very similar to the existing mudflats and sediments.

### 3.2.8 Hydrological Impacts

Construction will not interfere with the natural drainage of the area. The proposed filler soil is granular, and fill slopes on the creek side of the site will be protected against erosion by pitching. However, during construction, some spillage of fill mater waste on foreshore areas may be unavoidable. Careful construction operations should limit spillage to a minimum, resulting in no significant hydrological impact.

### 3.2.9 Sediment Quality

Sediment contamination could have been a concern due to disturbances caused by the anticipated dredging, excavation, reclamation, and construction work releasing contaminants into the water column; either in solution or re-suspension of particulate matter. However, since the sediment does not fall into a contaminated category, the construction work is not expected to have an adverse impact on the quality of water or have a toxic effect on aquatic biota. No mitigation measures are required as the construction of the LNG terminal associated dredging and lying of the subsea pipeline are short-term processes.

### 3.2.10 Effects of Disposal of Dredge Spoil on Water Quality

The construction of the LNG terminal facility, in particular the jetty, the subsea pipeline and dredging activities will result in short-term increases in the suspend loading of the creek system, which could affect local flora and fauna, and therefore local fishermen. Dredgers will be equipped with suction devices to minimize the spread of fugitive sediments in the water column. Based on 20 years of continuous study of the effects of dredging in the PQA, the effects of additional sediments suspended in the water column are short-lived and not a significant source of disruption except in the immediate local area. Benthic organisms quickly repopulate the dredged areas, and fish in the affected water column typically move to clearer water until the sediments settle, then return. The

sediment quality survey of the area adjacent to the proposed LNG Jetty indicates that the site area is not contaminated to any significant level, therefore the bioavailability of any contaminants are not high, and no mitigation measures are therefore required.

### 3.2.11 Spillages of Construction Materials and Piling Wastes

During the construction of the LNG terminal, it is possible that construction materials could either be released accidentally or dumped intentionally into the marine environment. Although materials like rock, concrete, plastics, etc. are relatively inert, other materials such as metals, etc. can cause deleterious effects on water quality.

Other than a large scale accidental spill of fuels or other mechanical fluids, the impact of an individual event is likely to be small and not significantly adverse. No impact on ground or submarine soil or water is anticipated.

### 3.2.12 Drainage from the Berth and Storage Areas

The LNG terminal will not handle water or soil pollutants. The storm water runoff from storage areas and berth will be relatively lacking in contaminant discharge other than windblown dust and some traces of oils. Runoff from the jetty and similar built surfaces will be allowed to flow through a series of catch pits leading to drains that discharge directly to the water.

As rainfall in the area is scarce, the runoff from onshore facilities would be minimal. In addition, it is planned to regularly sweep the areas to remove the littered/spilled solid wastes and dust. No mitigation measures are required as far as the proposed LNG terminal is concerned.

### 3.2.13 Oil Spills

Spillage of oil and other hydrocarbon-based fuels, such as diesel, or untreated oily slops or ballast water, has marked pollution impacts that affect the quality of water and create damage to the aquatic environment & ecosystems. In enclosed channels such as at PQA, the breakdown of fuel spilled into the water can cause marine faunal mortality.

### 3.2.14 Discharges from the Septic Tank

Incident of discharge of untreated sewage into the creeks could have potentially adverse effects on water quality. Any impact would be influenced principally by the effluent quality and quantity, and the extent of dispersion around the point of discharge. For example, discharge of raw sewage with a high BOD to low energy in sheltered water could cause localized oxygen depletion.

The industries in Port Qasim area are required to treat their industrial waste and sewage and discharge the treated effluent meeting EPA's NEQS. The LNG terminal will have only domestic sewage from its offices which will be collected and treated in a septic tank. Wastes from the FSRU will be collected by contractors and appropriately treated and disposed of.

No mitigation measures other than treatment of effluent in septic tanks before its discharge into PQA sewerage system or infiltration into the soil through a septic tank drain field is required.

### 3.2.15 Discharges of Ships' Wastes

The discharge of ships' wastes into the main channel & onto port waters could cause contamination of water and sediments. Secondary impacts could arise, such as the degradation of fisheries and marine habitats.

### 3.2.16 Terrestrial Ecology

The construction of the proposed LNG Terminal, storage area, and subsea pipeline will not result in significant damage to the ecosystem, which is only sparsely vegetated with a few plant species, each of which is prevalent in the Karachi region. It is estimated that the onshore ecology will be minimally affected, if at all. Some land will be used for construction of onshore facilities, but no unique habitat exists on the site.

## 3.3 Biological Resources

### 3.3.1 Mangroves

For the construction of the subsea delivery pipeline and LNG jetty, the project design is intended to avoid affecting mangroves. No mangrove plants will be removed at the locations along the alignment of the subsea pipeline. The proposed routing of the pipeline and construction design ensures that no major damage to this important asset is caused. The technique employed for laying the pipeline underneath the sea bed is environment friendly, causing minimal disturbance to the ecology particularly relating to mangroves and benthos. For construction of the jetty, access to the work area will primarily be by barge, so no roads, laydown areas or similar use of surface lands are required. A condition of the project approval from SEPA is that any single mangrove disturbed during construction of the project will be required to be replaced ten-fold. The project is committed to exercise great care to avoid impacts to nearby mangroves.

### 3.3.2 Marine Ecology

The impact of dredging within the project area includes suppression of species variety, population density and biomass as well as differences in species composition compared with the surrounding deposits. Generally, there will be no suppression of species diversity, population density or biomass benthic macro fauna outside the immediate boundaries of the dredged sites.

The impact of dredging and reclamation for the proposed LNG Jetty will have very localized impacts on the macro fauna near the site. Moreover, re-colonization by most species will occur after the construction of proposed LNG Jetty when the stable environment will prevail.

There are a number of mitigation measures which can be implemented in order to reduce the significance of this potential impact. These are given below (a combination of most practical measures will be adopted):

1. For use of dredged spoil for reclamation, build a coffer dam to retrain the dredged material which is especially designed to strain water without releasing significant sediment load back into the marine ecosystem using a geo textile barrier.
2. Reduce overspill as far as practically possible.
3. Ensure that the discharge pipe is located at a suitable location within the coffer dam.
4. Use an efficient trailing suction hopper dredger wherever possible.
5. As no endangered species are reported to exist in the area, the impact from construction on the marine ecology will therefore be local, small and temporary.

Other impacts on marine ecology associated with dredging operation:

1. Removal of benthos.
2. Smothering of benthos.
3. Release of contaminants.
4. Noise disturbance to marine fauna.

The excavation of the area for pipeline laying, dredging, and depositing dredge material behind the cofferdam will impact the habitat of the proposed site and the benthos of the Kadero Creek, to avoid significant impacts, proper care must be taken during construction. There will be inevitable removal of some benthic species at the construction sites. Some of the species could be important in themselves or as a source of food for other marine fauna including of the adjoining area. It is a natural phenomenon that after the construction phase is over the species from adjacent areas will recolonize at the site. The exact composition of species in terms of abundance and distribution may not recolonize in the area initially but with the passage of time and stability in the ecology of the

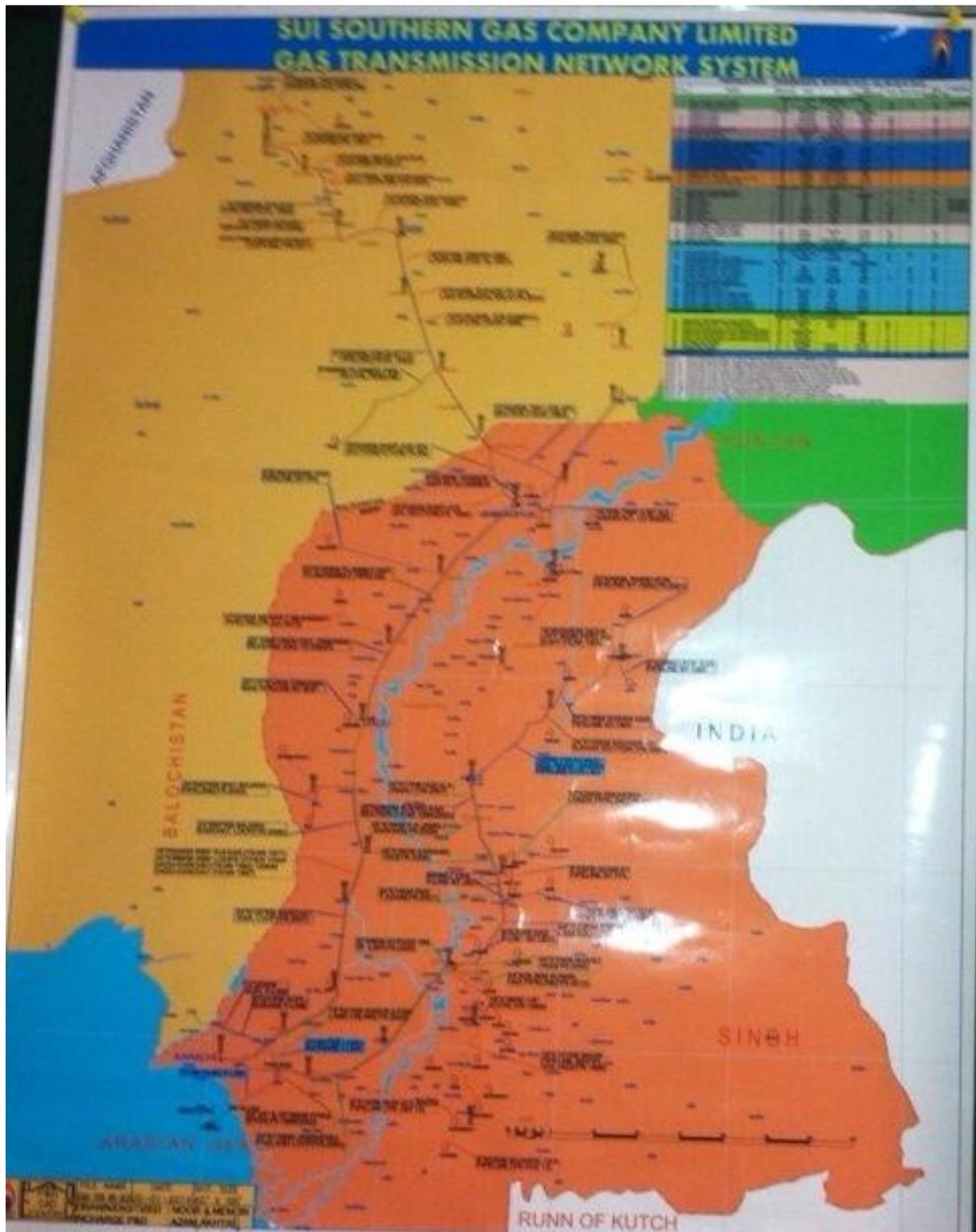
area, the habitat may become similar in nature as prior to the construction by long-lived species. Since the pipeline laying is a short term activity, the impact may not be very significant, because the severity of impact is dependent on the amount of sediment in suspension, sediment size distribution, and the current movement in the operation area. It is anticipated that the turbidity thus caused will not have a significant impact.

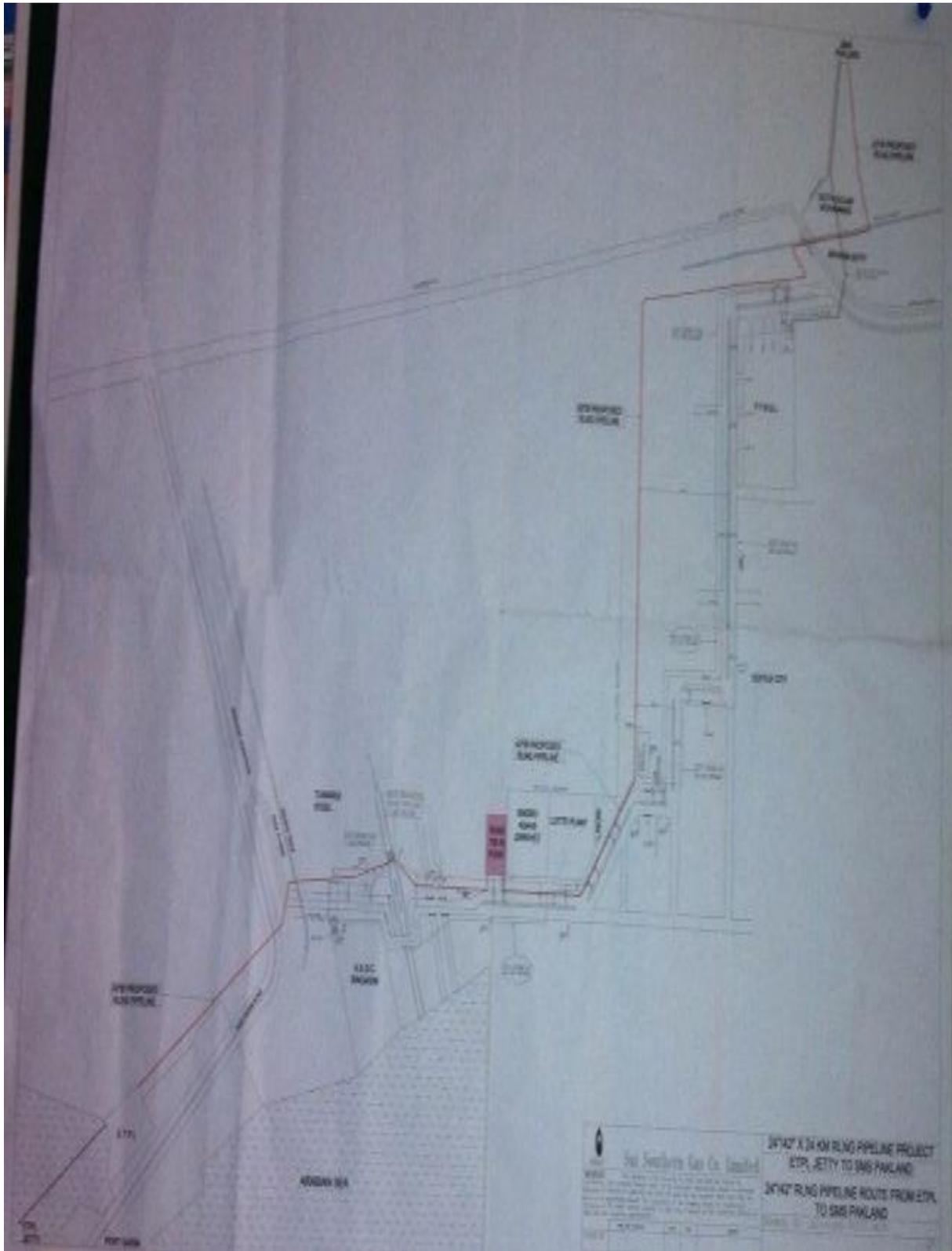
The operational activity involves shipping traffic, and off-loading LNG at the jetty. The Jetty and the LPG storage facility have been designed to conform with standard international safety specification for handling LPG. All necessary control measures have been incorporated ensure that no fugitive emissions enter the marine ecosystem. The nature of the project is such that it will have no significant impact on marine ecology. The liquid effluents from the offices will be treated to meet EPA standards and will have no potential for pollution of the habitats occupied by juvenile fish and other commercially important species. The potential threat to fish is from the untreated industrial and municipal sewage being discharged into the creeks. The operation of LPG Terminal will have no impact on the marine ecology of the area.

The proposed LNG Jetty project area is not known to contain any rare or endangered species and the terminal/jetty is not expected to disturb the ecology of the core area significantly. The project is also not expected to release any pollutants during normal operation. Its location and operation is not expected to affect the breeding habitats of marine animals or migratory paths of any bird species. No adverse impacts are anticipated on marine life during operation. The only probability of degrading the ecosystem will be collision of ships or boats, or tanker oil spill due to tanker accident. However, the ecological impact would be confined to the ecosystem around the spill zone and the effects would dissipate after a short period.

No mitigations measures would be required during operation. However, a contingency plan has been developed to combat oil spills in case of an emergency. The LNG Jetty will maintain an in-house capability to fight medium size oil spills due to accidents, and in addition is a participant in Spill Contingency Planning developed by and in implementation at Port Qasim.

### 3.4 Project Location









The Container Terminal at Port Qasim



General Overview of Port Qasim



Proposed Site for LNG Terminal



Mangrove at Port Qasim

# 4. Screening Potential Environmental Impacts and Mitigation Measures

## 4.1 Impact Assessment and Mitigation

EPP's support for GOP's LNG Import Program is ongoing, and involves providing technical, commercial and legal support to GOP's nominated agencies (SSGC, ISGS, PQA) through the services of local and International consultants to support the LNG import program covering the full LNG supply chain.

The location and scale of the works are very important in predicting environmental impacts. This process of impact prediction is at the core of the EMMP process. It is critical that the recommendations and mitigation measures are carried out with reference to conditions on the ground in the affected areas and in the spirit of the environmental assessment process. In this section, potential environmental impacts are reviewed. Where impacts are significant enough to exceed accepted environmental standards, mitigation is proposed in order to reduce residual impact to acceptable levels and achieve expected outcomes of the project. Therefore, it is essential that a proper analysis is carried out during the project planning period. In this regard, impact prediction plays a vital role as these predictions are used to develop adequate mitigation measures and any alternative options, as appropriate.

Per the Approved USAID IEE (OAPA Tracking #: OAPA-13-Nov-PAK-0003) has set the following environmental compliance result 1) Categorical exclusions per 22 CFR 216.2 (C) (2) (i) and 2) Negative Determination with Condition per 22 CFR 216.3 (a) (2) (iii). According to approved IEE an EDF shall be prepared for the activity, EDF is include the Environmental Mitigation and Monitoring Plan (EMMP), this EDF has to be approved by the A/COR and MEO/DMEO.

## 4.2 General Approach to Mitigation

Based on experience on some projects, contractors have put emphasis on the financial compensation for nuisances. This may be acceptable for some social impacts where evacuation is necessary or where houses have been accidentally damaged. However, it is not the best international practice to accept payment for environmental impacts. An approach whereby the subproject contractor pays money for nuisances rather than control the impacts at source is not acceptable. This practice will not be allowed and financial compensation shall not be allowed as mitigation for environmental impacts or environmental nuisance(s).

During preparation for construction activities of the proposed project, the future contractors must be notified and prepared to co-operate with the executing agency and local communities during the mitigation of impacts. Furthermore, the contractor must be primed through bidding stages and the contract documentation to implement the EMMP in full and be ready to engage trained environmental management staff to audit the effectiveness and review mitigation measures as the project proceeds. Implementation of the EMMP will be audited in cooperation with the executing agencies (PQA, VOPAK/ETPL & SSGC). In this regard, PQA, VOPAK/ETPL & SSGC must fulfill the requirements of the law and guidance prepared by EPA on the environmental aspects of LNG Project and the recommendations made for proposed activities.

No residences or schools are in the immediate vicinity of the project locations and thus no potential impacts during the construction and operational stage from disturbance and significant noise and dust are expected.

Certain construction activity could cause generation of air borne dust, but any nuisance from this is likely to be very localized and temporary. Other project activities, e.g. movement of heavy

vehicles/tractor trolley on unpaved tracks during the works, could generate considerable dust. Water is available in the study area, although surplus water may not always be available to suppress dust at vulnerable locations in the dry season. Therefore, as a general approach, it is recommended that where work is undertaken within 15m of any residential sensitive receivers, the contractor will install segregation between the work and the edge of the sensitive receivers.

Noise levels resulting from construction activity should not be a major consideration unless the activity is very close to schools or hospitals, where construction will be avoided at sensitive times. In addition to the physical effect of mitigating dust and noise with barriers, installation of such measures will be discussed with the local population and serve as a vehicle for further public consultation at the implementation stage to assist in public relations.

### 4.3 Cultural Heritage, Mosques, Religious Sites, and Social Infrastructure

There are no mosques or other religious sites close to the site. The nearest clinic/hospital is more than 500m from the edge of the subproject. Apart from these features, there will be sufficient buffer distance between the work and any other Sensitive Receptors (SRs), thus no significant impacts are expected. In the proposed project development, no families will be relocated. No cultural and archeological site is located near the proposed project sites.

### 4.4 Potential Environmental Impacts during Design, Construction and Operation Stage

#### 4.4.1 Social Impacts

PQA and VOPAK / ETPL will select site locations that will not affect any public property or house.

#### 4.4.2 Waste Disposal

Suitable locations will be identified for disposal of dredging material. Disposal sites in contracts and the cost of unit disposal rates will be designated accordingly.

PQA, VOPAK / ETPL and SSGC shall ensure that any residual oily waste and other contaminated waste generated in the construction and operational phase of the project is disposed of in line with provincial EPA and local authority requirements. With the proper implementation of appropriate waste disposal protocols, there will be no residual risk due to improper waste disposal.

#### 4.4.3 Pollution from Oily Run-off, Fuel Spills and Dangerous Goods

No significant impacts from oily residues such as oil and lubricants are expected to arise. However, control measures will be conducted for oily residues such as oil and lubricants in the case of accidental or unexpected release. Oil is supplied in drums from an imported source and tap tanks are topped up as necessary on site. There are facilities in some subproject of maintenance yards for recycling (dehydrating) oil from breakers. However, the areas upon which these recycling facilities are located have no dedicated drainage that can capture run-off. Oily residues and fuel and any contaminated soil residues will be captured at source and refueling and maintenance will take place in dedicated areas away from surface water resources. Contaminated residues and oily waste residues will be disposed of at a site in agreement with the local authority. No significant impacts from oily residue such as transformer oil and lubricants are expected to arise in this subproject. However, control measures will be needed for oily residues such as transformer oil and lubricants in the case of accidental or unexpected release.

#### 4.4.4 Cut and Fill and Waste Disposal

At this stage, no areas require removal of woodland. However, if any plantations are affected, the contractor will be provided resources to reinstate the woodland in the long term and a plantation compensation plan will be drawn up to replant the woodland trees. In the event that the land is not

suitable for plantation, other areas will be identified to replace the cut trees and sufficient areas will be identified to allow planting of trees at a rate of 3:1. The replacement ratio will allow for a high mortality rate among the newly planted trees in the dry environment or otherwise as based on advice from the forest authority.

Contractual clauses will be included to require each contractor to produce a materials management plan (one month before construction commences) to identify all sources of cement and aggregates and to balance cut and fill. The plan will clearly state the methods to be employed prior to, and during, the extraction of materials and all the mitigation measures to be employed to mitigate nuisances to local residents. Financial compensation will not be allowed as mitigation for environmental impacts or environmental nuisance. Mitigation measures will seek to control impacts at source in the first place.

#### 4.4.5 Trees, Ecology and Protected Areas

There is reserve or protected Forests or trees near the sites. In case of removal of trees on private land during the work, written permission will be obtained.

If for some unforeseen reason, trees with religious significance or other trees need to be removed, written permission will be obtained from the forest authority and the owner after written justification by PQA. Trees will be planted to replace lost trees with three trees planted to replace every cut tree (3:1) or more as agreed with the authority.

#### 4.4.6 Noise, Vibration and Blasting

It is anticipated that powered mechanical equipment and some local labor with hand tool methods will be used to construct subproject works. No blasting is anticipated. However, powered mechanical equipment can generate significant noise and vibration and the cumulative effect from several machines can be significant. To minimize such impacts, the contractor will be requested by the construction supervision consultants (engineer) to provide evidence and certification that all equipment to be used for construction is fitted with necessary air pollution and noise dampening devices in order to meet EPA requirements.

### 4.5 National Environmental Quality Standard (NEQS- 2000)

Table I: National Standard on Noise

S. No.	Category of Area	Standard Up to 30th June 1997 Limits in dB(A)		Standard from 1st July 1997 Limits in dB(A)	
A	Residential Area	65	50	55	45
B	Commercial Area	70	60	65	55
C	Industrial Area	80	75	75	65
D	Silence Zone	55	45	50	45

**Note:**

- Day time hours: 6 .00 am to 10.00 pm.
- Night Time hours: 10.00 pm to 6.00 am.
- Silence zone: Zones which are declared as such by the competent authority. An area comprising not less than 100 meters around hospitals, educational institutions and courts and courts.
- Mixed categories of areas may be declared as one of the four above-mentioned categories by the competent authority.
- dB(A) Leq: time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

Noise will be monitored at a distance of 100 m from the boundary wall of any residential unit and should follow the NEQS of 45dB (A).

Noise from construction of the power distribution lines and improvements to substations is not covered under any regulation. However in order to keep in line with best international practice, it is recommended that no construction should be allowed during nighttime (9 PM to 6 AM). Any noisy equipment should be located as far from SRs as possible to prevent nuisances to dwellings and other structures from operation. However, if the noise still exceeds NEQS, noise barriers will be installed around the equipment.

Vibration from construction of piles to support pads may be required for some tower construction and may have a significant impact; but should be short duration. Where vibration could become a major consideration (within say 100m of schools, religious premises, hospitals or residences) a building condition survey will be undertaken prior to construction.

## 4.6 Monitoring

The above mentioned environmental aspects have been assessed and mitigation measures for potential adverse impacts identified during the VOPAK / ETPL study. In order to ensure that proposed mitigation measures are implemented, the monitoring requirements, including indicators and specific requirements, are listed in Table 6. The overall responsibility of EMMP's monitoring rests with PQA, VOPAK / ETPL and SSGC Management. This monitoring arrangement can be carried out either by using the existing staff with requisite expertise or a dedicated HSE supervisor may be hired in case of time and/or capacity constraints. The EPP environment team will monitor these actions and will report them in quarterly progress reports to USAID.

## 4.7 Training Requirements

Trainings will be required in the following areas for implementation of the EMMP:

1. Occupational Health and Safety: All concerned staff shall be provided training in use of PPEs. Training may also be required in confined space identification and entry procedure. External sources may be needed to provide this training. At a later stage this training may be provided internally.
2. Waste Management and Handling: The relevant staff will require training in waste management and handling. This training can be provided internally.

## 4.8 Occupational Safety Measures

Lack of appropriate occupation health and safety measures practice is a key area of concern. Recommendations have been provided in Sections 3 and 4 of this report. It is recommended that an appropriate HSE management system be developed. It should include:

- HSE Policy,
- Occupational health and safety management measures,
- Use of personal protection equipment,
- Trainings requirement and management,
- Documented procedures,
- Monitoring and audit, and
- Reporting.

Although development of such a system is beyond the scope of the present project, some standard procedures relevant to the present project are provided in Annex III for reference.

## 4.9 Staffing

For the environmental performance during project execution, the primary responsibilities will be assumed by the highest ranking officer at PQA and SSGC. This person will be assisted by the Head

of Maintenance on all environment and safety-related matters. On behalf of the contractors, the main responsibility for all matters pertaining to the environment will be that of the Head of the Company.

Per the approved EIA for LNG, project management will appoint or designate a dedicated HSE Team, that will be responsible for ensuring compliance with the approved EMP and waste management procedures during project activities. The team also will be responsible for training of project related personnel in all aspects of the EMP.

## 4.10 Responsibilities

The following are the key responsibilities of VOPAK / ETPL management and staff, in the context of approved EIA's EMP:

1. Ensure that the construction is carried out in accordance with the EMP.
2. Ensure that all resources are made available to implement provisions of the EMP.
3. Maintain appropriate records (checklist, receipts, inspection reports, audit reports, monitoring data) to demonstrate that the EMP is fully implemented.

## 4.11 Reporting

EPP's environment team will only report (based on inputs provided by implementing partners and field visits) that activities are being performed as per the approved EMP. and will prepare a brief monitoring report submitted to USAID once every three months. The report will summarize the following:

- Activities carried out.
- Waste generated and handled.
- Inspections carried out.
- Status of implementation.
- Occupational safety and health and environmental issues that were raised and resolved.
- Pending issues.
- Occupational safety and health and environmental related incidents.

In case of any accident involving an occupational safety issue or environmental issue (accidental release of pollutant) a report detailing the incident will be submitted to USAID within 48 hours.

In case of any change in implementation plans, the contractor will reevaluate the occupational safety, health and relevant environmental issues and modify the EMMP accordingly. The revised EMMP will be submitted to USAID for approval.

A proposed format for the inspection and monitoring of the project activities is presented in Annex IV.

Table 2: Environmental Mitigation Matrix (Approved by the Sindh EPA)

Environmental Concern/ Affected Areas	Possible Mitigation Measures	Responsibility	Monitoring Frequency
Air Quality	Smoking should be prohibited at all sites.	HSE Officer	Continuous Monitoring
	Proper servicing of vehicle, provision of exhaust mufflers.	Contractor	Weekly Monitoring
	All equipment should be properly tuned.	HSE Officer & Contractor	Monthly Monitoring
	Fire- fighting equipment should be available for all activity areas at all times.	HSE Officer	Weekly Monitoring
	Staff should be provided with personal protective equipment.	HSE Officer	Continuous Monitoring
Noise	Safety valves should be provided with silencers.	Manager (Eng. & HSE Officer)	Continuous Monitoring
	Machinery and equipment should be housed in separate enclosures.	Manager (Eng. & HSE Officer)	When Required
	Working hours should be adjusted so as not to exceed 8 hours exposure in a single shift.	HSE Officer	Weekly Monitoring
	Earthmoving equipment should be kept in good condition through proper maintenance and servicing.	HSE Officer	Continuous Monitoring
	Use of horns should be prohibited within the activity.	HSE Officer & Contractor	Continuous Monitoring
Soil	Construction activities should not be extended beyond designated buffer zones.	HSE Officer & Contractor	Continuous Monitoring
	Natural and existing drainage should be used to the extent possible.	HSE Officer & Contractor	When Required
	Fuel, oil and other hazardous material, if stored on land, should be provided with impervious lining,	HSE Officer	Continuous Monitoring
	Combustibles and explosives should not be stored in the storage area.	HSE Officer	Continuous Monitoring
	Fuel tanks and hazardous material should be marked appropriately; the fuel storage area should be checked regularly to identify leakage.	HSE Officer	Weekly Monitoring
	Safety equipment and utensils should be available at site at all times. The vehicle maintenance yard should be developed at the designated location during construction work.	HSE Officer & Contractor	Continuous Monitoring
	Where possible, segregation of solid waste during handling should be followed to manage it effectively.	Contractor	Weekly Monitoring
	The contractor should follow EVTL's emergency response plan.	Contractor	Continuous Monitoring
Machinery movement should be restricted to the construction corridor. Restoration of sites after completion of the project should be mandatory.	Contractor	Continuous Monitoring	

Environmental Concern/ Affected Areas	Possible Mitigation Measures	Responsibility	Monitoring Frequency
Water Quality	Temporary latrines should be located at suitable distances from water bodies.	Contractor	At Placement of Latrines
	Sewage should be treated appropriately at each unit.	HSE Office	Monthly Monitoring
	Vehicle cleaning should be prohibited near water bodies.	HSE Officer	Continuous Monitoring
	Construction machinery should be kept off water resources to the extent possible.	HSE Officer	Continuous Monitoring
	Weekly/Monthly water wastewater/groundwater quality monitoring should be conducted throughout construction/operation.	HSE Officer	Weekly Monitoring
	Treated wastewater of acceptable quality may be reused for processing construction material.	HSE Officer & Contractor	If Required
Solid Waste	Solid waste should be collected and stored in an environmental friendly manner.	HSE Officer	Weekly Monitoring
	A certified solid waste contractor should be hired for disposal of waste.	HSE Officer	Weekly Monitoring
	Solid waste should be kept in closed containers.	HSE Officer	Weekly Monitoring

Table 3: Environmental Monitoring Plan (Approved by the Sindh EPA)

Stage	Monitoring Areas	Parameters and Techniques to Monitor	Monitoring Frequency	Reason to Monitor Parameter	Responsibility	Reporting to USAID
Construction	Dredging	Benthic Community Erosion and Sedimentation Vegetation Disposal of Dredge Material	Continuous	Dredging results in disturbance of benthic community causes soil erosion and sedimentation.	Health, Safety & Environment Department	Quarterly
	Marine Ecology	Biodiversity	Continuous	Unmitigated operations may result in loss of biodiversity.	Health, Safety & Environment Department	Quarterly
	Air Emissions	CO, SO <sub>x</sub> , NO <sub>x</sub> , PM10, PM2.5 and SPM	Before start of construction activity Monthly monitoring during construction and operation	Emissions from construction machinery and power production and operation of FSRU may result in deterioration of air quality.	Health, Safety & Environment Department	Quarterly
	Solid Waste	Solid waste quality and quantity	Continuous	Improper disposal may result in deterioration of marine ecology.	Health, Safety & Environment Department	Quarterly
	Wastewater	Primary pollutants of NEQS	Monthly	Improper disposal may result in deterioration of marine ecology.	Health, Safety & Environment Department	Quarterly
	Noise	Noise Intensity	I Start of construction I Monthly	Uncontrolled noise may cause nuisance.	Health, Safety & Environment Department	Quarterly
	Soil	Soil contamination Soil erosion Soil sedimentation	Monthly	Surface and sea water pollution.	Health, Safety & Environment Department	Quarterly
	Occupational Safety	Accidents PPEs Annoyance	Continuous	Occupational safety and legal obligations.	Health, Safety & Environment Department	Quarterly
	Land reclamation	Soil quality	Continuous	Legal obligations and structure protections. Prevention of soil erosion and sedimentation to the port.	Health, Safety & Environment Department	Quarterly
End of Construction	Restoration of sites	Visual analysis Photographic records	End of construction	Compliance of Environmental Approval Conditions.	Health, Safety & Environment Department.	Quarterly

Stage	Monitoring Areas	Parameters and Techniques to Monitor	Monitoring Frequency	Reason to Monitor Parameter	Responsibility	Reporting to USAID
Operation	Waste water	Waste water minimization Storage and handling Recycling and reuse Treatment before disposal Primary pollutants of NEQS	Monthly	Compliance of Environmental Approval Conditions.	Health, Safety & Environment Department	Quarterly
	Solid waste	Solid waste quality and quantity; solid waste disposal	Monthly	Compliance of Environmental Approval Conditions.	Health, Safety & Environment Department	Quarterly
	Fire & Safety	Fire hazard & safety protocols	Continuous	Compliance of Environmental Approval Conditions.	Health, Safety & Environment Department	Quarterly
	Air Emissions	CO, SO <sub>x</sub> , NO <sub>x</sub> , PM10, PM2.5 and SPM	Monthly	Compliance of Environmental Approval Conditions.	Health, Safety & Environment Department	Quarterly
	Noise	Noise intensity measurement	Monthly	Compliance of Environmental Approval Conditions	Health, Safety & Environment Department	Quarterly
	Hazardous spill	Spill on Land Spill on Water	Continuous	Compliance of Environmental Approval Conditions.	Health, Safety & Environment Department	Quarterly
	Traffic management	Standard operating procedures	Continuous	Compliance of Environmental Approval Conditions.	Health, Safety & Environment Department	Quarterly
	Compliance monitoring	EIA commitments and mitigation measures Conditions of environmental approval SOPs	Monthly	EIA Commitments. Mitigation Measures. Conditions of Environmental Approval. SOPs.	Independent Monitoring Consultant (IMC)	Quarterly

## 5. References

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3. Self-Monitoring and Reporting by Industry Rule, 2001 [http://www.environment.gov.pk/NEQS/selfmon\\_ru01.pdf](http://www.environment.gov.pk/NEQS/selfmon_ru01.pdf).
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8. Environmental, Health, and Safety General Guidelines <http://www.oe-eb.at/en/osn/DownloadCenter/guidelines/Environmental-Social-Standards-World-Bank-Group.pdf>
9. Asia environmental guideline at, <http://www.usaid.gov/our-work/environment/compliance/and/guidelines.htm>.
10. Environmental Guidelines for Small Scale Activities in Africa, 2nd edition as provided at <http://www.encapafrika.org>.
11. IFC Environmental, Health and Safety Guidelines as provided <http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentaiGuidelines>.
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15. World Bank Environmental Assessment Handbook and Updates <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTENVASS/0,,contentMDK:20282864-pagePK:148956-piPK:216618theSitePK:407988,00.html>.
16. ESIA report for LNG terminal (Engro VOPAK/ETPL Terminal Ltd.).
17. IEE report for proposed LNG import terminal at Port Qasim by EPTL.
18. IEE report for proposed LNG pipeline.



# ANNEXES



# Annex I: IEE of the Proposed Activity





# USAID | PAKISTAN

FROM THE AMERICAN PEOPLE

## INITIAL ENVIRONMENTAL EXAMINATION

### PROGRAM/ACTIVITY DATA:

**Country:** Pakistan

**Objective:** Provide technical assistance To USAID/Pakistan program to increase power generation (MWs) on the Grid, decrease transmission losses and increase cost recovery and supporting Government of Pakistan (GOP) reform efforts.

**Activity Name:** Energy Policy Program (EPP)

**Funding Begins:** FY 2012      **Funding Ends:** 15 Oct 2015      **LOP Amount:** \$80,283,410

**IEE Prepared By:** Imran Ahmed

**Date:** 01 October, 2012

**IEE Amendment (Y/N):** No If "yes", Filename & date of original IEE:

However, Request for Categorical Exclusion (OAPA tracking No., OAPA-12-OCT-PAK-0001) was approved on October 07, 2011 for activities known at the start of project.

### ENVIRONMENTAL ACTION RECOMMENDED: (Place X where applicable)

Categorical Exclusion	<input checked="" type="checkbox"/>	Deferral	<input type="checkbox"/>
Positive Determination	<input type="checkbox"/>	Negative Determination	<input checked="" type="checkbox"/>
With Conditions	<input checked="" type="checkbox"/>	Exemption	<input type="checkbox"/>

## 1.0 BACKGROUND AND ACTIVITY/PROGRAM DESCRIPTION

### 1.1 Purpose and Scope of IEE

Purpose of this Initial Environmental Examination (IEE), in accordance with 22 CFR 216, is to provide the first review of the reasonably foreseeable effects on the environment as well as recommended Threshold Decisions for the proposed new activities in the existing Energy Policy Program ("EPP" or the "Program") in support of the Government of Pakistan ("GOP") which have been authorized by increasing the program ceiling from \$14,893,410 to \$80,283,410 and extending the completion date to October 15, 2015. Referred authorization amendment to the EPP increases the ceiling to allow the added resources to fund additional highly visible and high impact activities in generation, transmission, and policy and power sector reform. This IEE is applicable to all the task orders under this program.

A "Request for Categorical Exclusion" (OAPA tracking No. OAPA-12-OCT-PAK-0001) was approved on October 07, 2011 for all known activities of the program at the start which at that time was known as "Pakistan Power Generation and Transmission Improvement Project (GTIP)". This IEE is therefore prepared to incorporate all newly identified and expanded activities of the same program. The scope of work and nature of activities established under the earlier approved Request for Categorical Exclusion (RCE) as well as all conditions established in the referred RCE for continuing activities remain the same and in force. This will be referred as IEE for Energy Policy Project (EPP) (the new name for Pakistan Power Generation and Transmission Improvement Project (GTIP) viz modification 1 of contract/order No. AID-EPP-I-00-03-00004)

## 1.2 Background

The objectives of EPP are two-fold: (1) support USAID in its efforts to add more power (MWs) to the Pakistan power system through generation and transmission improvements; and (2) support GOP counterparts in undertaking a range of policy initiatives to resolve the energy crisis and complete the implementation of the GOP's stalled Power Sector Reform Program. These efforts support USAID's overall intermediate development results of increased energy supply and improved energy sector governance. These in turn support the USAID Energy Office's higher level development objective of increased energy supplied to the economy, including (1) increased energy availability; (2) decreased hours of unscheduled load shedding; and (3) reduced percentage growth rate in the circular debt in the energy sector. Going forward, it is important to note that USAID's Energy Office will only have two implementing mechanisms, in addition to project-specific funding agreements called Fixed Amount Reimbursable Agreements (FARAs), to achieve its energy sector objectives: EPP and the USAID Power Distribution Program ("PDP"). EPP focuses on generation, transmission, system operations, and higher-level policy initiatives, including fuel-mix issues.

Key EPP partners include the following:

1. Ministry of Water and Power (MWP);
2. Planning Commission (PC);
3. Ministry of Petroleum and Natural Resources (MPNR);
4. Water and Power Development Authority (WAPDA);
5. GENCO Holding Company;
6. Generation Companies (GENCOs);
7. National Dispatch and Transmission Company (NTDC);
8. National Power Control Center (NPCC);
9. Multilateral lenders such as the Asian Development Bank (ADB) and the World Bank (WB).

The EPP is currently operating under Task Order 12, signed in October 2011 with effective date of February 1, 2012. The Task Order 12 completion date is set at January 31, 2015, leaving 30 months remaining in the program as of the date of this Action Memorandum. The estimated cost ("Task Order Ceiling") for Task Order 12 was set at \$14,893,410, with the current obligation set at \$6,693,080 as of the signature date.

In support of the USG's Signature Power Generation Projects funded by USAID through FARAs with the GOP, the EPP, under Component 1, has overseen the addition of 447 MW to the national power supply system. This includes the following projects:

1. Tarbela Hydropower Station Rehabilitation Project: 128 MW added to the grid to date.
2. Muzaffargarh Thermal Power Station Rehabilitation Project: 280 MW added to the grid to date.
3. Jamshoro Thermal Power Station Rehabilitation Project: 25 MW added to the grid to date.
4. Satpara Multipurpose Dam Project: 14 MW added to the local grid.

Furthermore, EPP also has been assisting on other ongoing projects already committed, such as the Guddu Thermal Power Station Rehabilitation Project and the Gomal Zam Multipurpose Dam Project.

On Component 2, EPP has prepared a number of reports, action plans, and business plans for the MWP and other GOP entities and is working to advise and assist on their implementation. Under Component 3, EPP is evaluating potential new projects, including the Kurram Tangi Multipurpose Dam Project and the Mangla Hydropower Station Upgrading Project.

### 1.3 Description of Activities

Despite successes in adding new and rehabilitated generation capacity to the Pakistan power system, the USAID/Pakistan Energy Office and the Government of Pakistan are concerned with the overall worsening trend in the Pakistan energy sector crisis. For example, the incidence of both planned and unplanned load shedding increased year-over-year, and appears set to reach new levels in the coming year. At the same time, circular debt is still increasing. As a consequence of USAID's concern and the Government of Pakistan's request to review what more could be done in the shorter term, the Energy Office has held several meetings over a period of time with EPP, USAID's other direct partners, and generation, transmission, and distribution companies in June and July 2012 to discuss progress on implementation and develop current and future activities that can produce short-term impacts.

The additional high visibility and high impact activities proposed include the contracting of an liquefied natural gas (LNG) advisor to assist the GOP in importing LNG as a short-term solution to add power to the grid; consulting services and equipment to monitor and improve the efficiency of the GOP's thermal generating plants ("GENCOs") to improve output in the short-term; and consulting services to assist the National Power Control Center ("NPCC") to improve its functions and reduce the incidence of unscheduled load shedding in the short term, and consulting services and equipment to improve transmission at National Transmission Dispatch Company (NTDC) and DISCOs with an emphasis on the transmission systems of a Model DISCO and Turnaround (PESCO) DISCO. Consequently, USAID is proposing new and adjusted in-scope activities focused on five main areas keeping gender as a crosscutting component, with a renewed focus on short-term results under component 4 of EPP.

#### Adjusted Activities:

1. NTDC/NPCC/Unscheduled Load Shedding – Continue and expand efforts to improve operations, enhance economic dispatch, and reduce incidence of unscheduled load shedding; develop concept and scope of work for the import of power from Afghanistan to Peshawar;
2. GENCOs – Continue and expand efforts to improve operating efficiency at GOP-owned thermal generating facilities;
3. GOP advisors - Continue support for embedded personnel to drive the policy discussion at key GOP counterpart agencies.

#### New Activities:

1. Turnaround and Model DISCO transmission system interventions and live line training in all nine DISCOs.
2. Natural Gas – Support the GOP in developing the LNG option while at the same time advising on reforms to stimulate domestic production of natural gas.

## 2.0 Environmental Lessons Learned from similar USAID funded energy projects in Pakistan

Under the phase-I Signature Energy Program, the U.S. Government acting through USAID is funding the rehabilitation of four power plants, which includes three thermals (Jamshoro, Muzaffargarh and Guddu) and one hydro (Tarbela dam). The IEE's for rehabilitation were developed before the implementation began in May-Jun 2010 which identified 'Negative Determination with Conditions' per CFR 216, and recommended development of Environmental Mitigation and Monitoring plans (EMMPs) for each plant to elaborate environmentally safe and sound waste management and disposal as well as ensure compliance with all Occupational Health and Safety (OHS) requirements acceptable to USAID. USAID supported the development of EMMP's for individual power plants through its Energy Policy Program (EPP). The implementation of the EMMP is being carried out by the GOP implementing partners' as per the G2G agreements.

Following are the lessons learned during the design and implementation of EMMPs:

- A main environmental concern was to ensure safe disposal of old equipment/spares and wastes to make sure that the rehabilitation was compliant with GOP and USG environmental policies and regulations. This concern was addressed by the development of EMMPs as part of a rapid Environmental Assessment for each plant by environmental experts hired by USAID. Observations regarding environmental mitigation, monitoring and OHS measures were recorded with photographs by the environmental experts during their initial site visits. The assessment was completed with support from the GOP implementing partners who also reviewed and agreed with the recommendations in the EMMPs.
- Tarbela dam is operated under WAPDA which has a separate environmental cell that supervises the implementation of environmental activities. Therefore the monitoring of EMMP is being carried out in close collaboration with WAPDA Environmental Cell with oversight from USAID. This program is acceptable to both parties.

## 3.0 LEGISLATIVE AND REGULATORY FRAMEWORK

### 3.1 NATIONAL REQUIREMENTS

#### 3.1.1 Pakistan Environmental Protection Act, 1997

The Pakistan Environmental Protection Act, 1997 (the Act/PEPA) is the basic legislative tool empowering the government to frame regulations for the protection of the environment [the 'environment' has been defined in the Act as: (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the interrelationships between any of the factors specified in sub-clauses 'a' to 'f'.]

The Act is applicable to a broad range of issues and extends to socioeconomic aspects, land acquisition, air, water, soil, marine and noise pollution, as well as the handling of hazardous waste. The discharge or emission of any effluent, waste, air pollutant or noise in an amount, concentration or level in excess of the National Environmental Quality Standards (NEQS) specified by the Pakistan Environmental Protection Agency (Pak- EPA) has been prohibited under the Act, and penalties have been prescribed for those contravening the provisions of the Act. The powers of the federal and provincial Environmental Protection Agencies (EPAs), established under the Pakistan Environmental Protection Ordinance 1983, have also been

considerably enhanced under the 1997 legislation and they have been given the power to conduct inquiries into possible breaches of environmental law either of their own accord, or upon the registration of a complaint.

The PEPA and corresponding Pakistan Environmental Protection Agency Review for IEE and EIA Regulations (2000) prescribe the environmental assessment requirements and procedures applicable in Pakistan. The PEPA, Section 12 requires proponents of all development projects to prepare and submit environmental assessment reports for review and approval by the competent authority. It also lays down the requirements for Initial Environmental Examination (IEE) and EIA. "No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal EPA or Provincial EPAs as the case may be, or, where the project is likely to cause adverse Environmental effects, an EIA and has obtained from the Government Agency approval in respect thereof;"

'The Government Agency shall, subject to standards fixed by Pak EPA:

- a) Review the IEE and accord its approval, or require submission of an EIA by the proponent or:
- b) Review the EIA and accord its approval subject to such conditions as it may deem fit to impose, require that the EIA be resubmitted after such modification as may be stipulated or reject the project as being contrary to environmental objectives.

PAK-EPA in August 2000 issued "Policy and Procedures for Filing, Review and Approval of Environmental Assessment". Schedules A and B define the type of development projects requiring EIA or IEE respectively. Schedule A provides a list of projects which have potential to affect a large number of people. The impacts of these projects may be irreversible and could lead to significant changes in land use and in the social, physical and biological environment. For dams and irrigation projects Schedule A determines that EIA is required for "dams and reservoirs with a maximum storage volume greater than 50 million m<sup>3</sup> or surface area greater than 8 km<sup>2</sup> or irrigation serving more than 15,000 ha."

Schedule B defines projects which require IEE. It deals with projects where the range of environmental issues is comparatively narrow and issues can be understood and managed through less extensive analysis. Under the legislation of Pakistan, an IEE is required for 'dams and reservoirs with a maximum storage volume less than 50 million m<sup>3</sup> or surface area less than 8 km<sup>2</sup> or small scale irrigation systems."

### **3.1.2 Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulations 2000**

The PEPA review of the 2000 IEE and EIA regulations (the 'regulations') provides the necessary details on the preparation, submission and review of the IEE and the EIA reports. The regulation classifies projects on the basis of expected degree of adverse environmental impacts and lists them in two separate schedules. Schedule-I lists projects that may not have significant environmental impacts and therefore require an IEE. Schedule-II lists projects of potentially significant environmental impacts requiring preparation of an EIA. However, it may be noted that this regulation does not have any other category for equipment procurement projects.

### 3.1.3 National Environmental Quality Standards (NEQS) 2000

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

**In addition to the aforementioned, following regulatory and other Government of Pakistan requirements should be complied with:**

1. Pakistan Environmental Protection Act, 1997  
<http://www.environment.gov.pk/act-rules/Brief-PEPA-Act1997.pdf>
2. National Quality Standards Regulation, 2000  
<http://www.environment.gov.pk/NEQS/neqs2000.pdf>
3. Self-Monitoring and Reporting by Industry Rule, 2001  
[http://www.environment.gov.pk/NEQS/selfmon\\_ru01.pdf](http://www.environment.gov.pk/NEQS/selfmon_ru01.pdf)
4. Pakistan IEE/EIA Regulation, 2000  
<http://www.environment.gov.pk/act-rules/IEE-EIA-REG.pdf>
5. Hazardous Substances Rules, 2003  
[http://www.environment.gov.pk/pro\\_pdf/HAZ-RU03.pdf](http://www.environment.gov.pk/pro_pdf/HAZ-RU03.pdf)
6. Draft Guidelines for Solid Waste Management, 2005  
<http://www.environment.gov.pk/EA-GLines/SWMGLinesDraft.pdf>
7. Environmental, Health, and Safety General Guidelines  
[http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui\\_EHSGuidelines2007\\_GeneralEHS/SFILE/Final+-+General+EHS+Guidelines.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/SFILE/Final+-+General+EHS+Guidelines.pdf)

The Pakistan Environmental Protection Act 1997 requires that an initial environmental examination or environmental impact assessment shall be carried out for every 'project'. The types of project for which the requirement is applicable are listed in Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment (EIA) Procedures 2000. The definition of the project under the law includes both construction of a new project and modification to the existing project. There is no definition in the law on the level of modification which defines the threshold after which the IEE or EIA requirement is applicable on a modification project. However, the practice that is followed is that if the modification results in substantial change in the emission, effluent, waste generation, production, or use of natural resources, the IEE or the EIA, as appropriate shall be carried out.

### 3.2 USAID REQUIREMENTS

The United States laws require that all activities financed by USAID shall comply with the requirement of the US law 22 CFR 216. To promote pesticide safety, the USAID environmental regulations require that for any pesticide, or any chemical that can also be used as pesticide, a Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) shall be prepared. USAID has prepared a program level PERSUAP for its activities in Pakistan. It is likely, that certain waste material may contain chemicals that are regulated by PERSUAP. If any chemical from waste material falls in the regulated category, AEAI shall inform USAID.

### 4.0 Identification and Evaluation of Program Issues with Respect to Environmental Impacts Potential and Recommended Threshold Decisions:

**4.0 Identification and Evaluation of Program Issues with Respect to Environmental Impacts Potential and Recommended Threshold Decisions:**

**4.1.1 Categorical Exclusion** per 22CFR216.2(c)(2)(i) has determined for activities under the project. These include:

- a) Identification of opportunities to implement activities for improvement of the sector and/or respond to the load-shedding crisis.
- b) Assistance to the DISCOs and Government Ministries/ Departments in policy reforms.
- c) Training of specially selected crew of lineman.
- d) Strengthening the capacity of public sector GENCOs and hydropower stations and NPCC staff to improve technical and management decision making
- e) Sustainable improvement in upstream policy, rules, regulatory framework and E& P programs to expedite increase in domestic production to mitigate fuel supply issues to power sector.
- f) Support decision-making for a rational setting of GOP direction for alternative fuels
- g) Explore the technical options and commercial considerations for Pakistan to import power from Turkmenistan, and Uzbekistan through Afghanistan to mitigate the energy crisis.
- h) Capacity building for Membership of Electric Power Research Institute (EPRI), USA for 2 years
- i) Training to dispatch engineers on system operation and load dispatch techniques.
- j) Provision of two to three advisers at NPCC and three advisers for the GENCOs
- k) Increased awareness about the business plans and best practices to manage these entities.
- l) Increased awareness about the key activities and success stories of EPP
- m) Electronic/Digital documentation of project activities and accomplishments highlighting USAID as the problem solver to the energy crisis.
- n) Training of staff for the improved operation and maintenance
- o) Provision of authentic data base of system assets (condition and options) for future use.
- p) Provide prioritized recommendations for performance improvement to improve system reliability.

Implementers will follow best industry practices for Environmentally Sound Design and Management (ESDM) and all trainings etc., will be conducted on appropriate environmental considerations.

**4.1.2 Negative Determination with Conditions** per 22 CFR 216.3 (a) (2) (iii).

- a. Equipment including laboratory equipment, electric power generation / distribution / testing equipment, spare parts, computers and furniture etc., procured under this project require appropriate disposal at the end of their useful life. The project will include requirements for proper disposal in all authorizations for such procurement. A Negative Determination per 22 CFR 216.3(a)(2)(iii) is recommended for purchase of all such equipment provided in the project in accordance with ADS 312
- b. Activities under the project may have potentially minor to moderate adverse environmental and social impacts and thus qualify for These include:
  - i. Design and oversight for identified system improvements.
  - ii. Facilitation of successful formulation and implementation of GOP's LNG import program and institutional capacity building.
  - iii. Rehabilitation and renovation activities / Construction Supervision and Environmental mitigation and monitoring activities

- v. Enable turnaround DISCO to handle future imports of electricity from Central Asian Republics.
- vi. Strengthen Transformer repair shops for DISCOs.
- vii. Procure, install and commission instrumentation to allow continual heat rate assessment (heat sensors for predictive maintenance).
- viii. Perform a one-time heat rate test for the GENCOs that will serve as a baseline for each station while meeting NEPRA requirements to have a reputable third-party perform the test.
- ix. Replacement and Up gradation of Equipment

Required mitigations are the development of an Environmental Documentation Form (EDF) including an Environmental Monitoring and Mitigation Plan (EMMP)<sup>1</sup> for each of the activities under Component B and for the status of the resettlement plan it is required provision of housing, land and compensation. The EDF must be cleared by the COR/program Manager and approved by the USAID Pakistan Mission Environmental Officer (MEO)

**5.0 Summary of Recommended Threshold Decisions**

The originator of this action has determined that the following activities of the Project have no adverse effect on the physical and/or natural environment under: (I) Categorical Exclusion per 22CFR216.2(c)(2)(i); and (II) Negative Determination with Conditions per 22 CFR 216.3(2)(iii). The table below applies and provides environmental determinations to the illustrative activities of the Project.

No	Task Description	Activities	Environmental Impact	Recommended Determination
1.	Turnaround (PESCO) & model DISCO (Possibly FESCO) Transmission Improvement	Upgrading of the transmission system to Improve the transmission and maintenance capacity of two DISCOs, which may involve Rehabilitation and renovation activities / Construction Supervision. (turnaround DISCO identified as PESCO and Model DISCO possibly FESCO). This will enable turnaround DISCO to handle future imports of electricity from Central Asian Republics. The model DISCO will gain around 500-600 MWs	Minor to moderate adverse impact on natural and physical environment is expected.	<b>Negative Determination with Conditions</b> per 22 CFR 216.3 (a) (2) (iii), the Conditions (with reference to the Pakistani laws and guidance being: a) use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID; b) an EDF shall be prepared for each activity; c) based on the A/COR & MEO approved EDF including an Environmental Mitigation and Monitoring Plan (EMMP, see Attachment 1) shall be prepared, which will elaborate environmentally safe and sound waste management and disposal as well as ensure compliance with all OHS requirements acceptable to USAID; EMMP shall be approved by A/COR & MEO. Additional

<sup>1</sup> These forms are Attachment 1 and 2 of this IEE

No	Task Description	Activities	Environmental Impact	Recommended Determination
		through these measures. Transformer repair shops for both DISCOs will also be strengthened.		Conditions are stipulated below.
2.	Turnaround (PESCO) & model DISCO (Possibly FESCO) Transmission Improvement	Design and oversight for any identified system improvements. The USG may choose to put a part of this money into a FARA instead of AEAI.	Minor to moderate adverse impact on natural and physical environment is expected.	<b>Negative Determination with Conditions</b> per 22 CFR 216.3 (a) (2) (iii), the Conditions (with reference to the Pakistani laws and guidance being: a) use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID; b) an EDF shall be prepared for each activity; c) based on the A/COR & MEO approved EDF including an Environmental Mitigation and Monitoring Plan (EMMP, see Attachment 1) shall be prepared, which will elaborate environmentally safe and sound waste management and disposal as well as ensure compliance with all OHS requirements acceptable to USAID; EMMP shall be approved by A/COR & MEO. Additional Conditions are stipulated below.
3.	High Impact Opportunities	Identification of opportunities to implement activities for improving the sector and/or respond to the load-shedding crisis, especially where there is a political will. The activity will focus on identification of those opportunities which have visible impact over the life of the project.	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)

No	Task Description	Activities	Environmental Impact	Recommended Determination
4.	Governance	<p>Assistance to the DISCOs and Government Ministries/ Departments in policy reforms. The project will provide Best Professional Judgment on priorities to both the USG and GOP.</p> <p>Assistance to GENCOs in implementing systematic change such as in the human resources area (utilizing Leadership Change Management) with the goal of overall organizational restructuring which shall include, but not limited to improving transparency and reducing mismanagement.</p>	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
5.	Live line Training at nine DISCOs	<p>Training of specially selected crew of lineman on how to do repairs to reduce losses of MWHrs on live electric lines, current world best practice in all model utilities, to reduce revenue losses from sales and industrial sector outputs. Offering specialized skills to lineman will help improve the incentive structure and the maintenance technique of the discos.</p> <p>Nine vehicles with</p>	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)

No	Task Description	Activities	Environmental Impact	Recommended Determination
		accessories for transmission system lineman in DISCOs will be purchased either through PDP and/or alternate mechanism.		
6.	Specialized services in developing a LNG supply chain for MPNR.	Facilitate successful formulation and implementation of GOP's LNG import program and institutional capacity building. Provide short term solution for meeting gas shortages and improve fuel supply to power sector	Minor to moderate adverse impact on natural and physical environment is expected.	<b>Negative Determination with Conditions</b> per 22 CFR 216.3 (a) (2) (iii), the Conditions (with reference to the Pakistani laws and guidance being: a) use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID; b) an EDF shall be prepared for each activity; c) based on the A/COR & MEO approved EDF including an Environmental Mitigation and Monitoring Plan (EMMP, see Attachment 1) shall be prepared, which will elaborate environmentally safe and sound waste management and disposal as well as ensure compliance with all OHS requirements acceptable to USAID; EMMP shall be approved by A/COR & MEO. Additional Conditions are stipulated below.
7.	Provide overall E & P expertise to support MPNR in upstream Oil & Gas activities, including shale gas (Policy, regulatory oversight, concessions, EP activities etc.)	Sustainable improvement in upstream policy, rules, regulatory framework and E& P programs to expedite increase in domestic production to mitigate fuel supply issues to power sector.	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)

No	Task Description	Activities	Environmental Impact	Recommended Determination
8.	Add 1mid-level adviser at MPNR (National Staff)	Support decision-making for a rational setting of GOP direction for alternative fuels	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
9.	Concept report for power import from regional countries	Explore the technical options and commercial considerations for Pakistan to import power from Turkmenistan, and Uzbekistan through Afghanistan to mitigate the energy crisis. Report will provide a higher level of information to assist decision makers on appropriate future actions.	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
10.	Feasibility Study for power import from Afghanistan.	Details for possible improvement in the capacity and availability of the power sector. Results will provide the requisite information to develop scope of work to produce a tender for design, procurement and construction of the transmission system/line(s) to Peshawar.	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
11.	Transmission system review of NTDC and DISCOS (two) 500, 220, 132 and 66 KV network, data collection, technical audit and	Provide an authentic data base of system assets (condition and options) for future use. Provide prioritized recommendations for performance improvement to improve system reliability. Additional personnel will be	Minor to moderate adverse impact on natural and physical environment is expected.	<b>Negative Determination with Conditions</b> per 22 CFR 216.3 (a) (2) (iii), the Conditions (with reference to the Pakistani laws and guidance being: a) use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID; b) an EDF shall be prepared for each activity; c) based on the A/COR & MEO

No	Task Description	Activities	Environmental Impact	Recommended Determination
	performance improvement action plan.	needed to conduct this audit such as O&M engineer, protection engineer, analyst, communications engineer. They will seek to identify constraints but also be involved in training GOP personnel to resolve bottlenecks.		approved EDF including an Environmental Mitigation and Monitoring Plan (EMMP, see Attachment 1) shall be prepared, which will elaborate environmentally safe and sound waste management and disposal as well as ensure compliance with all OHS requirements acceptable to USAID; EMMP shall be approved by A/COR & MEO. Additional Conditions are stipulated below.
12.	Real time digital simulator (hardware & software) for DC and AC transmission system at NTDC	Capacity building at NTDC and for NPCC. Benefits include: <ul style="list-style-type: none"> <li>- Improved DC &amp; AC system operation</li> <li>- Improved protection and system integration</li> <li>- Tool to assist NPCC staff improve understanding of the grid and make more informed dispatching decisions.</li> </ul>	Minor to moderate adverse impact on natural and physical environment is expected.	<b>Negative Determination with Conditions</b> per 22 CFR 216.3 (a) (2) (iii), the Conditions (with reference to the Pakistani laws and guidance being: a) use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID; b) an EDF shall be prepared for each activity; c) based on the A/COR & MEO approved EDF including an Environmental Mitigation and Monitoring Plan (EMMP, see Attachment 1) shall be prepared, which will elaborate environmentally safe and sound waste management and disposal as well as ensure compliance with all OHS requirements acceptable to USAID; EMMP shall be approved by A/COR & MEO. Additional Conditions are stipulated below.
13.	Power Planning, NTDC Capacity Building	Membership of Electric Power Research Institute (EPRI), USA for 2 years (will have access to EGEAS and other software Enhanced technical skill for improved performance to overcome the present	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)

No	Task Description	Activities	Environmental Impact	Recommended Determination
		crises and cater modern era challenges		
14.	Training	<p>a. NPCC planning department for creating the database for thermal and hydro generators</p> <p>b. Operation &amp; Maintenance practices for promoting energy efficiency in thermal and hydro power plants.</p> <p>Training to dispatch engineers on system operation and load dispatch techniques. Strengthening the capacity of public sector GENCOs and hydropower stations and NPCC staff to improve technical and management decision making: Improved O&amp;M practices can lead to increased availability and efficiency, reducing unscheduled loan shedding; Improved planning can lead to optimized resource allocation and improved system efficiencies; and, Improved load dispatch can provide system efficiency gains.</p> <p>Training will be provided to GENCO personnel.</p>	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)

No	Task Description	Activities	Environmental Impact	Recommended Determination
15.	Secondment of staff	Provide two to three advisers at NPCC (National is already a staff member) and 1 International Staff part time to improve economic dispatch and reduce planned and unplanned load shedding Three advisers for the GENCOs (At least 1 International (priority) and eventually 2 other Staff for each of three GENCOs)	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
16.	Perform heat rate analysis at one GENCO thermal power station	Procure, install and commission instrumentation to allow continual heat rate assessment (heat sensors for predictive maintenance). Perform a one-time heat rate test for the GENCOs that will serve as a baseline for each station while meeting NEPRA requirements to have a reputable third-party perform the test. Benefits include: <ol style="list-style-type: none"> <li>1. Improved cost recovery by providing a revised basis for the allowable tariff</li> <li>2. Activity funds are leveraged – Utility to install and test</li> </ol>	Minor to moderate adverse impact on natural and physical environment is expected.	<b>Negative Determination with Conditions</b> per 22 CFR 216.3 (a) (2) (iii), the Conditions (with reference to the Pakistani laws and guidance being: a) use of environmentally sound materials, monitoring and evaluation (M&E), and good international industry practices acceptable to USAID; b) an EDF shall be prepared for each activity; c) based on the A/COR & MEO approved EDF including an Environmental Mitigation and Monitoring Plan (EMMP, see Attachment 1) shall be prepared, which will elaborate environmentally safe and sound waste management and disposal as well as ensure compliance with all OHS requirements acceptable to USAID; EMMP shall be approved by A/COR & MEO. Additional Conditions are stipulated below.

No	Task Description	Activities	Environmental Impact	Recommended Determination
		equipment 3. Data will allow for more efficient operations resulting in improved financial position.		
17.	Workshops for BOD of NTDC and senior management of GENCOs and training on internal audit procedures	Increased awareness about the business plans and best practices to manage these entities.	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
18.	Workshops for disseminating results of key activities of EPP.	Increased awareness about the key activities and success stories of EPP	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
19.	Increase public awareness campaign –	Electronic/Digital documentation of project activities and accomplishments highlighting USAID as the problem solver to the energy crisis.	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)
20.	Add Legal Advisor and/or Pakistani Firm Subcontract to provide advice on various GOP contracts	This would be for assistance above and beyond what is being proposed related to LNG and gas.	No adverse impact on the natural or physical environment	Categorical Exclusion 22 CFR 216.2(c)(2)(i)

## 5.1 Other Conditions

The Implementer shall ensure that:

1. ALL activities will be implemented in accordance with the Pakistani environmental, OHS, regulations, standards, norms and guidelines and national obligations under ratified international environmental agreements (see: <http://www.environment.gov.pk>) and in their absence in accordance with the best international practice appropriate to the seismicity levels in Pakistan and in the respective districts; these should be acceptable to USAID.
2. All activities will be implemented in accordance with best practice guidance provided in the Asia environmental guidelines at [www.usaid.gov/our\\_work/environment/compliance/ane/guidelines.htm](http://www.usaid.gov/our_work/environment/compliance/ane/guidelines.htm); Environmental Guidelines for Small Scale Activities in Africa, 2<sup>nd</sup> edition as provided at <http://www.encapafrika.org>; EBRD Sub-sectoral Environmental and Social Guidelines (<http://www.ebrd.com/about/policies/enviro/sectoral/>); ADB Environmental Guidelines (<http://www.adb.org/Water/CFWS/Roadmap-Sectoral-Guidelines.pdf>).
3. The Implementer shall include environment compliance considerations into all aspects of the project implementation and will promote and train local counterparts on environmental requirements and standards across all of the project's activities; such proposed activities will be included in annual work plans, and results will be reported in annual reports.
4. Implementer will seek concurrence and obtain all applicable permits and licenses from the national duly authorized environmental and relevant agencies. Implementer will also seek concurrence from the duly provincial environmental agency(ies) on each the EMMP. The Contractor is required to obtain a letter from the local or regional office for environmental protection stating that the office: a) has been contacted by the contractor concerning the project activities; b) will maintain contact with the project; and c) will be aware of the potential environmental impacts of the project to help ensure that no detrimental impact will result from this project.
5. The implementing partners shall minimize the use of, and properly dispose of hazardous materials and wastes for all project activities. The implementing partners will adhere to USEPA guidance at [www.epa.gov/asbestos](http://www.epa.gov/asbestos) and [www.epa.gov/lead/pubs/renovation.htm](http://www.epa.gov/lead/pubs/renovation.htm) for dealing with asbestos and lead.
6. The implementing partners will screen all potential environmental impacts by preparing an Environmental Document Form (EDF) (**Attachment 1**). The implementing partners will prepare Environmental Mitigation and Monitoring Plan (EMMP) (**Attachment 2**) for all moderate risk activities and will monitor implementation to ensure enforcement of the mitigating measures. All such reviews and conditions will be documented, reviewed by the COR/AOR and the Mission Environmental Officer (MEO) / Deputy Mission Environmental Officer (DMEO) for the program, and maintained in project files and documentation.
7. Recommendations from the Environmental Lessons Learnt from similar USAID funded signature energy projects in Pakistan will be duly addressed in each EMMP to be developed for project sub activities.
8. The implementing partners will have adequate funds to implement any environmental mitigation and monitoring measures as well as it/they will have a qualified, MEO-approved environmental impact professional(s) (EIP) who will assess and recommend environmental actions to be taken by the project and will coordinate implementation of mitigation measures, monitoring and reporting.
9. The recipient will properly manage and dispose equipment when its useful life ends. For procuring of electronic and miscellaneous equipment and furniture, the implementing partners will adhere to USAID's general policies on commodity eligibility provided at <http://www.usaid.gov/policy/ads/300/31251m.pdf> and will not finance unsafe or ineffective

- products, such as certain pesticides, food products, or pharmaceuticals and other commodities not eligible for financing under this policy.
10. When equipment (computers, electric power generation & distribution equipment, laboratory equipment, etc.) is procured, at the end of its life, it will be disposed in an environmentally safe manner by a certified company in accordance with Pakistani laws, and in their absence, in accordance with international best practices acceptable to USAID (alternatively, when procuring equipment from a licensed provider/dealer an agreement may be reached that such equipment will be returned to the dealer for its environmentally safe disposal).
  11. Monitoring will be conducted during the project (beginning with a baseline) to determine the environmental impact (positive and/or negative) of all project activities. Contractor shall use only qualified staff for overseeing the mitigation and monitoring work. Monitoring shall occur during implementation as stipulated in the MEO approved EMMP. The Contractor will ensure that the environmental procedures are implemented, potential impacts mitigated. If negative environmental impacts are discovered through regular monitoring and evaluation of project activities, immediate actions will be taken to rectify the situation.
  12. When asbestos and/or lead-containing paints are encountered, these will be treated in accordance with the best international industry and management practice, acceptable to USAID in accordance with guidance at: <http://www.epa.gov>
  13. All environmental Conditions established in this IEE shall be duly transposed in RFP and Contract.
  14. USAID will arrange for mandatory environmental training for the key personnel of implementing partner and other stakeholders by the REA/Asia & OAPA and/or the MEO/DMEO before the project activities begin.
  15. COR, together with the MEO/DMEO, USAID/Pakistan will explain and clarify, at the project launch, to the Implementer environmental conditions and compliance procedures established in this IEE and the Contract.
  16. Implementer(s) shall document and regularly report to USAID on the implementation of the Negative Determination with Conditions (NDC) activities; reporting will include photographic documentation and site visit reports confirming implementation of the agreed EMMP, photos of site-specific activities prior to, during and after rehabilitation and renovation activities, during operation.
  17. USAID/Pakistan COR and MEO/DMEO shall regularly audit the Contractor's processes and related documents including inspection reports to ensure 22 CFR 216 environmental compliance throughout the life of the Contract.
  18. If any un-anticipated potentially significant environmental and social impacts are expected to arise, the COP shall promptly notify the COR and MEO/DMEO and seek guidance on the proper course of action.
  19. New activities introduced into the project that are substantively different from those presented in this IEE will required submission of an amended IEE to the BEO/OAPA.
  20. No additional activities will be conducted prior to receiving approval of the amended IEE by the BEO/OAPA. The implementing partners shall minimize the use of, and properly dispose of hazardous materials and wastes for rehabilitation and renovation activities.
  21. In accordance with 22 CFR 216.2 (a), this IEE will be amended to reflect substantive amendments, including change in funding levels and scopes of activities, or extensions of ongoing projects, programs and activities.
  22. Use of personal protection equipment should be in practice as is needed for the activities funded under the project.
  23. All transformers should be free from Polychlorinated Biphenyls (PCBs)

#### **6.0 Allocation, Training and Reporting requirements:**

- Reports will be submitted to the Contracting Officer's Representative (COR) and Mission Environmental Officer (MEO) at the completion of activity.
- The Contractor's progress report to USAID shall contain a section specific to environmental mitigation and monitoring and will include project summaries along with environmental impacts, success or failure of mitigation measures being implemented, results of environmental monitoring, and any major modifications/revisions to the project, mitigation measures or monitoring procedures.
- COR/MEO will explain to the Contractor(s) all environmental Conditions established in this IEE and their applicability to specific activities.

#### **7.0 LIMITATIONS OF THE IEE**

This assistance doesn't cover activities involving:

1. Assistance for the procurements (includes payment in kind, donations, guarantees of credit) or use (including handling, transport, fuel for transport, storage, mixing, loading, application, clean-up of spray equipment, and disposal) of pesticides (where pesticides cover all insecticides, fungicides, and rodenticides, etc. covered under the "Federal Insecticide, Fungicide, and Rodenticide Act" FIFRA.) or activities involving procurement, transport, use, storage, or disposal of toxic materials. All the proposed activities involving assistance for the procurement or use, or both, of pesticides in the existing and expanded geographic areas shall be subject to the procedures prescribed in 22 CFR 216.3(b)(1)(i) through (v). USAID/Pakistan has BEO/OAPA-approved Programmatic PERSUAP, which shall be used for any procurement, use and/or recommendation for use of pesticides. Referred USAID/Pakistan programmatic "umbrella" PERSAUP (PPERSUAP), covers procurement, use or recommendation of use of pesticides in all sectoral ongoing and planned programs and projects in the country for the forthcoming 3-5 years.
2. Assistance, procurement or use of genetically modified organisms (GMOs), will require preparation of biosafety assessment (review) in accordance with ADS 201.3.11.2(b) in an amendment to the IEE reviewed by the Agency Biosafety Review Advisor and approved by Asia BEO.
3. Procurement or use of Asbestos Containing Materials (ACM) i.e. piping, roofing, etc., Polychlorinated Biphenyl's (PCB) or other toxic/hazardous materials prohibited by US EPA as provided at: <http://www.epa.gov/asbestos> and/or under international environmental agreements and conventions e.g. Stockholm Convention on Persistent Organic Pollutions as provided at: <http://chm.pops.int>
4. USAID/Pakistan restricts the use of USAID funds, directly or indirectly, to produce, acquire, use, transport, store, sell, or otherwise deal with ammonium nitrate (AN) and calcium ammonium nitrate (CAN) for agricultural or rehabilitation and renovation activities and construction/demolition purposes.
5. Activities involving support to wood processing, agro-processing, industrial enterprises and regulatory permitting
6. GDA and/or DCA.

Any of these actions would require an amendment to the IEE duly approved by the BEO/OAPA.

## **8.0 REVISIONS**

In accordance with 22 CFR 216.3(a)(9,) if a project is revised or new information becomes available, including during preparation of an EDF, which indicates that a proposed action might be "major" and its effects "significant," the Determination will be reviewed and revised by the originator(s) of the program and projects and submitted through the MEO to the Bureau Environmental Officers, OAPA, for approval and, if warranted, an environmental assessment will be launched and scoping statement and environmental assessment report prepared. The scoping and EA process, if determined necessary during scoping, will follow and comply with 22 CFR 216.3(a)(4).

**Confidential information redacted**

**Attachment 1**

**Environmental Documentation Form**

**INSERT PROJECT NAME**

**A. Applicant information**

Contractor/grantee(organization)	Parent grant or project
individual contact and title	Address, phone and email (if available)
activity (brief description)	Amount
Location of activity	Start and end date of activity

**B. Activities, screening results, and recommended determination**

TABLE 1  Proposed Sub-activities	Screening result (Step 3 of instructions)			Recommended Determinations (Step 6 of instructions. Complete for all moderate and high-risk activities)		
	Very Low Risk	Moderate Risk	High Risk	No significant adverse impact	mitigation, no significant	Significant Adverse impact
1.						
2.						
3.						
4.						
6.						
8.						
9.						

(continue on additional page if necessary)

**C. Summary of recommended determinations (check all that apply)**

The activity contains. . .	<i>(equivalent regulation 216 terminology)</i>
<input type="checkbox"/> Very low risk sub-activities	<i>categorical exclusion(s)</i>
<input type="checkbox"/> After environmental review, sub-activities determined to have <b>no significant adverse impacts</b>	<i>negative determination(s)</i>
<input type="checkbox"/> After environmental review, sub-activities determined to have <b>no significant adverse impacts, given appropriate mitigation and monitoring</b>	<i>negative determination(s) with conditions</i>
<input type="checkbox"/> After environmental review, sub-activities determined to have <b>significant adverse impacts</b>	<i>positive determination(s)</i>

**D. Certification:**

I, the undersigned, certify that:

1. The information on this form is correct and complete
2. The following actions have been and will be taken to assure that the activity complies with environmental requirements established for the Mangla Dam under the Code of Federal Regulations 22 CFR 216:
3.
  - These design elements and best practices will be followed in implementing this activity, except with the approval of USAID.
  - Any specific mitigation or monitoring measures described in the attached information will be implemented in their entirety.
  - Compliance with these conditions will be regularly confirmed and documented by on-site inspections during the activity and at its completion.

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

**BELOW THIS LINE FOR USAID USE ONLY**

**Approval**

USAID Project Officer	(print name)	(signature)
<input type="checkbox"/> Approved		
<input type="checkbox"/> Rejected		
USAID MEO or DMEO	(print name)	(signature)
<input type="checkbox"/> Approved		
<input type="checkbox"/> Rejected		

**USAID comments: (if documentation is rejected, comments must be provided to applicant)**

Attachment 2

**Environmental Mitigation & Monitoring Plan (EMMP)**

- An EMMP should either be included in or developed for (1) **all IEEs** that have at least one “Negative Determination with Conditions” (or for activities for which an environmental review has been completed pursuant to an IEE requirement) and (2) all Environmental Assessments (EAs).
- If the EMMP is not developed as part of the IEE, the implementing partner should usually lead development of the EMMP, subject to review and oversight by the MEO and COTR/AOTR.
- In all cases, the tasks identified in the EMMP are incorporated into the implementing partner’s Work Plan, budget, and reporting.
- The following EMMP format is recommended. It can be adapted, as necessary.

**Environmental Mitigation and Monitoring Plan**

**Activity Title:**

**Implementer:**

Activity	Mitigation Measure(s)	Monitoring Indicator(s)	Monitoring and Reporting Frequency	Party(ies) Responsible	Indicative Budget
<p>List all activities in IEE that received a “negative determination with conditions.”</p> <p><i>Do not list any other activities in separate rows.</i></p>	<p>If mitigation measures are well-specified in the IEE, quote directly from IEE</p> <p>If they are not well-specified in the IEE, define more specifically here.</p>	<p>Specify indicators to (1) determine if mitigation is in place and (2) successful.</p> <p>For example, visual inspections for seepage around pit latrine; sedimentation at stream crossings, etc.)</p>	<p>For example: “monitor weekly, and report in quarterly reports. If XXX occurs, immediately inform USAID activity manager.”</p>	<p>If appropriate, <i>separately</i> specify the parties responsible for mitigation, for monitoring and for reporting.</p>	

## Annex II: Waste Management Companies



### **Petro Waste Busters**

Contacted person: Abdul Qayyum  
Designation: Coordinator  
Contact Number: +92 (51) 220 4348, 220 4350  
Website: <http://www.petrowaste.com.pk>  
Email: [aquyyum@petrowaste.com.pk](mailto:aquyyum@petrowaste.com.pk)  
Type of waste: Industrial and hazardous waste.  
Transportation and collection: They provide transportation.  
Internal and External audits: Not mentioned.  
Certifications: ISO 9000 and EPA certified.  
Disposal certificate: Yes.  
Comments: Detailed profile and NOCs received.

### **Waste Busters**

Contacted person: Zillay Mariam  
Designation:  
Contact number: +92 (42) 667 2632, +92 (42) 667 2065  
Website: <http://www.wastebusters.com.pk>  
Email: [zillay.m@gmail.com](mailto:zillay.m@gmail.com)  
Type of waste: Mostly industrial waste.  
Transportation and collection: Not mentioned.  
Internal and External audits: Not mentioned.  
Certifications: Not mentioned.  
Disposal certificate: Not mentioned.  
Comments: Demands project details and specifications before providing company profile.

### **GEL (Pvt.) Ltd /Global Environmental Management Services Pvt. Ltd**

Contacted person: Zahid Raza  
Designation: General Manager.  
Contact number: +92 (21) 351 13804 5  
Website: <http://www.gemspakistan.org>  
Email: [zraza@gel.com.pk](mailto:zraza@gel.com.pk)  
Type of waste: All types of waste.  
Transportation and collection: There is no regular arrangement.  
Internal and External audits: External auditors come and check Certifications Certified for Quality management systems at random intervals .

Disposal certificate:	Yes
Comments:	Details requested
<b>Waste Management Company</b>	
Contacted person:	Shariq Moazzam
Designation:	
Contact number:	+92 (21) 3431 1466
Website:	<a href="http://www.wmc.com.pk">http://www.wmc.com.pk</a>
Email:	<a href="mailto:shariq@wmc.com.pk">shariq@wmc.com.pk</a>
Type of waste:	<p>Waste oils and lubricants</p> <p>Waste oil sludge</p> <p>Oil contaminated soil</p> <p>Activated carbon</p> <p>Spent catalysts and exhausted media</p> <p>Waste chemicals/solvents</p> <p>Waste OBM and WBM and cuttings</p> <p>Oil Filters, air filters</p> <p>Amine filters</p> <p>Coalesces filters</p> <p>Printer and photocopier cartridges</p> <p>Food waste</p> <p>Metal waste</p> <p>Wood waste</p> <p>Glass waste</p> <p>Rubber and plastic waste</p> <p>Tires and tubes</p> <p>Insulation materials</p> <p>Clinical and biological waste</p> <p>Used batteries and cells</p> <p>Waste tube-lights and bulbs</p>
Transportation and collection:	<p>WMC (Pvt.) Ltd. hires third party audited vehicles having FTW “fit to work” status from reputable companies as and when required. WMC also ensures that the drivers and the companions engaged for the waste transportation are PPE clad, have training pertinent to safe driving and road safety and have the reasonable knowledge of HSE and knowledge about the sensitivity of activity with a satisfactory track record of driving rules and policy compliance /work (driving) experience, awareness about ROW (right of way).</p>
Internal and External audits:	Not mentioned.
Certifications:	ISO 9001, ISO 14001, OHSAS 18001
Disposal certificate:	Not mentioned.
Comments:	Demands project details and specifications before providing company profile.

**Bizxperts (Pvt.) Ltd.**

Contacted person: Muhammad Suffian Sabir  
Designation: Director  
Contact number: +92 (300) 833 1693  
Website: Not found.  
Email: [info@biz-xperts.com](mailto:info@biz-xperts.com)  
Type of waste: Hazardous and non-hazardous waste, pharmaceutical waste, clinical waste, dental waste, school waste, oil-absorbent materials, textiles, rubber, paper, carpet, and treated wood.

Transportation and collection: Waste collection service is generally provided.

Internal and External audits: Materials Recycling Audit that assesses and continually monitors entire waste handling process.

Certifications: Not mentioned.

Disposal certificate: Yes.

Comments: Detailed profile received.

**National Cleaner Production Center (NCPC)**

Contacted person: M Irshad Ramay  
Designation: Coordinator NCPC.  
Contact number: +92 (51) 548 7041  
Website: Not found.  
Email: [irshadramay@gmail.com](mailto:irshadramay@gmail.com)  
Type of waste:  
Transportation and collection:  
Internal and External audits: Regular internal and external audits are conducted.  
Certifications: EPA certification.

**WD Systems**

Contacted person: Shahid Shah  
Designation: Manager (Implementation).  
Contact number:  
Website: Not found.  
Email: [shahid.shah@wdsystems.com.pk](mailto:shahid.shah@wdsystems.com.pk)  
Type of waste:  
Transportation and collection:  
Internal and External audits:  
Certifications:  
Disposal certificate:  
Comments: Information requested.



## Annex III: NOC for IEEs and EIA from Sindh EPA



**Confidential information redacted**

[pages 65-70]

# Annex IV: Environmental and Social Monitoring Report—Sample



Report No		Prepared By:	
Date		Distribution	
Reference		Page	
Reporting Period			
Monitoring/ Inspection Team			

### Project Activities Carried Out

<i>Activity</i>	<i>Status</i>

### Waste Generated and Handled

<i>Waste Type</i>	<i>Sources</i>	<i>Quantity</i>	<i>Status</i>

### Summary of Occupational safety and health and environmental issues Identified

<i>No</i>	<i>Issue</i>	<i>Location</i>	<i>Discussion</i>	<i>Decision/Action</i>	<i>Responsible Person</i>	<i>Target Date</i>
1						
2						

### Follow-up of Outstanding Issues

<i>No</i>	<i>Date Issue Raised</i>	<i>Issue and Action</i>	<i>Status</i>	<i>Discussion</i>	<i>Responsible Person</i>	<i>Revised Target Date</i>

## Inspection

### A. Rating Codes for the Checklist

<i>Rating Code</i>	<i>Rating</i>	<i>Description</i>
3	Excellent	The activity, area, system, and/or knowledge are superior comments.
2	Adequate	The activity, area, system, and/or knowledge meet the basic minimum requirements, which include proper documentation and full implementation.
1	Deficient	The activity, area, system, and/or knowledge are weak and not up to acceptable standards (documented and not implemented or implemented and not documented). Comments outlining weaknesses required.
0	Unsatisfactory	The activity, area, system, and/or knowledge are missing or of such a nature to warrant serious no compliance. Comments detailing concerns required.
N/A	Not Applicable	The question is not applicable to the type of operation, or the item was unable to be addressed during the audit.

### B. Checklist

<i>Requirement</i>	<i>3</i>	<i>2</i>	<i>1</i>	<i>0</i>	<i>N/A</i>	<i>Details</i>
<b>A. Waste Handling and Storage</b>						
1. Use of protective leather gloves while handling sharp edged metals,						
2. All parts and machines dispatched from site to storage yard after dismantling, preferably on the same day,						
3. Marking and segregation of wastes in scrap yard and a clear passage way marked by lines on the ground for walking of staff. No waste stored within the passage way.						
4. Sharp edged metal are not to be left unattended at any time. In the storage yard, the storage area for sharp edged metals cordoned off using clearly visible tapes.						
5. All parts and machines dispatched from site after dismantling are moved to the store yard as soon as possible, preferably on the same day.						
6. Before final disposal, any potentially hazardous substance such as lead or material containing lead are identified and disposed of accordingly.						
7. To the extent possible, any oil or grease in the equipment is to be replaced and removed before dismantling of the equipment.						

Report No		Prepared By:	
Date		Distribution	
Reference		Page	
Reporting Period			
Monitoring/ Inspection Team			

<i>Requirement</i>	<i>3</i>	<i>2</i>	<i>1</i>	<i>0</i>	<i>N/A</i>	<i>Details</i>
8. All efforts are made to avoid spilling oil on the floor.						
9. Any spillage is removed immediately. For this purpose, spill control kits are made available near the work areas.						
10. Waste oil is stored in leak proof containers.						
11. Oil is stored in designated and clearly marked areas. The oil storage area is lined with impervious flooring.						
12. The oil storage area is away from direct heat and fire sources.						
13. The oil storage area has dykes constructed around it to control accidental leakages and spills.						
14. All type of plastic is collected and stored in separate bins marked for this purpose.						
15. Plastic waste is not burnt in the open air nor disposed of by dumping it in areas surrounding the Grid station site.						
16. Nails are removed from wood.						
17. All type of waste is collected and stored in separate bins marked for the designated purpose.						
18. Equipment is opened only under the supervision of a qualified person. Any potentially hazardous material such as mercury is identified prior to dismantling and appropriate safety measures are taken.						
19. Masks are used to avoid respiratory infections while handling carbon soot.						
20. Soot is transported and stored in covered containers.						
21. Soot is preferably disposed as soon as it is removed from the duct. Prolonged storage, particularly at the site, is avoided.						
22. Waste is not burnt in open air nor disposed of by dumping in the areas surrounding the grid station site.						
23. Standard protective equipment including eye protective glass, gloves and mask are used.						

<i>Requirement</i>	<i>3</i>	<i>2</i>	<i>1</i>	<i>0</i>	<i>N/A</i>	<i>Details</i>
<b>B. Waste Disposal</b>						
1. Oil contaminated parts are separated from other equipment parts..						
2. Oil contaminated parts of waste are cleaned before being fed into the furnace. Alternatively, the cleaning may be undertaken at the power station.						
3. Segregate wires and other copper material and insulation from other material.						
4. Before final disposal, any potentially hazardous substance such as lead or material containing lead is identified.						
5. The risk associated with the wastes is identified, and accepted disposal methods for such waste are followed.						
6. Only certified recycling contractors from the relevant agencies are used for disposal.						
7. Agreement with the contractors for the disposal of plastic waste in the designated pre-identified municipal landfill site.						
<b>C. Transportation of equipment</b>						
1. Vehicles used for the transportation are NEQS compliant for emissions and noise.						
<b>D. Onsite handling and storage of new equipment</b>						
1. The new equipment is stored in properly demarcated and identified areas.						
2. Separate storage of each item is adopted and each area is marked either on the floor or cordoned off by tapes.						
3. Lifting equipment (cranes) used for the equipment follows the prescribed safety specification.						
4. Material Safety Data Sheet (MSDS) for chemicals, if any, shall accompany the consignment. A copy of the MSDS is available near the storage area at all times.						
<b>E. Repair, rehabilitation and installation activities–General</b>						
1. Appropriate PPE is provided to workers and ensured that the PPEs' are used.						
2. The staff is provided with training in use of PPE.						

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<i>Requirement</i>	<i>3</i>	<i>2</i>	<i>1</i>	<i>0</i>	<i>N/A</i>	<i>Details</i>
3. Proper scaffolding platforms are provided for all work areas located more than 1 m above floor level.						
4. First aid facilities and fire protection devices are placed in areas where activities are to be performed.						
5. Ear protection devices are used if the noise level is above 85 dB(A).						
<b>F. Repair, rehabilitation and installation activities—Working in confined Spaces</b>						
1. All confined spaces are identified.						
2. The temperature of the confined space is within the human tolerance range.						
3. Artificial and intrinsically safe lighting is provided in confined spaces.						
4. If there is a risk of gases or fumes in the confined space, provision for ventilation is made.						
5.						





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