



Initial Environmental Examination

TENAGA GENERASI LIMITED

Supplement ◆

49.5 MW Wind Power Plant

Gharo

R11V03TGWPD

December 02, 2011

TEKCELLENT
(PVT) LIMITED
TECHNOLOGY ENGINEERING KNOWLEDGE MANAGEMENT

Tenaga Generasi Limited

Initial Environmental Examination

49.5 MW Wind Power Project

Gharo, Sindh

Supplement

TPL Reference: R11V03TGWPD – December 02, 2011

Prepared for:
Tenaga Generasi Limited

Acronyms

AC	After construction
AEDB	Alternative Energy Development Board
BC	Before construction
DC	During construction
DFO	Divisional Forest Officer
EHS	Environment, Health and Safety
EHSD	Environment, Health and Safety Department
EHSS	Environment, Health and Safety Supervisor
EHSM	Environment, Health and Safety Monitor
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
GoP	Government of Pakistan
GRM	Grievance Redress Mechanism
HIV/AIDS	Human immunodeficiency virus / Acquired immune deficiency syndrome
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
KM	Kilometer
NEQS	National Environmental Quality Standards
NGO	Non-Governmental Organization
O&M	Operation and Maintenance
PCB	Poly Chlorinated Biphenyl
PEPA	Pakistan Environmental Protection Act
P&DD	Planning and Development Department
TGL	Tenaga Generasi Limited
WWF	World Wide Fund for Nature

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1. Introduction

The supplementary report is being prepared to update the IEE report by consultations with the stakeholders and other organizations dealing with the flora and fauna issues of the project area to elicit any environmental concerns about the project and to obtain suggestions for improving the environmental aspects of the project area. In particular, comments were sought from the organizations that had met with the IFC team reviewing the project during their visit in July 2011.

1.1 Document Structure

Chapter 2 gives the background information of the project and the requirement. Details of the meetings with concerned departments and organizations are presented in **Chapter 3**. **Chapter 4** presents the findings and conclusion of the study.

Figures are provided in **Appendix A**. Revised Environmental Management Plan (EMP) is attached in **Appendix B**.

2. Background

An IEE for the Tenaga Generasi Wind Power Project was completed by Tekcellent Private limited (TPL) for the Dawood Group in 2009 which was submitted to Sindh Environmental Protection Agency (SEPA) and a NOC was granted. Before the start of the construction activities the project owners wanted to revisit the IEE so as to incorporate any changes regarding the environment and add details regarding the newly constructed road (Coastal Highway), which will now be the primary route to the site. A map illustrating the new route to the project area is presented in **Figure 1 of Appendix A**.

The International Finance Corporation (IFC), who will be participating in the project financing, also required clarifications on the IEE regarding some of the environmental issues which might arise during or after the construction period.

Meetings were carried out by the TPL team comprising of Syed Masood Ahmed, Dr. S. A. Ghalib and Rameez Shahid with the Coastal Forest Division of the Sindh Forest Department, International Union of Conservation of Nature (IUCN), Sindh Wildlife Department, Zoological Survey Department and the World Wildlife Fund (WWF).

The representatives of the respective organizations were briefed on the project background and likely project schedule. They were urged to provide details of any of their ongoing or imminent projects likely to take place in or near the project area, besides noting their concerns and suggestions.

3. Salients of Meetings

This Chapter provides the details of the meetings that took place with concerned Government Departments and Non-Government Organizations (NGOs). The salient points of the discussions are summarized below.

3.1 Meeting with Coastal Forest Division, Sindh Forest Department

Name: Mr. Agha Tahir Hussain, Divisional Forest Officer (DFO), Sindh

Date: 17th November, 2011

Venue: Coastal Forest Division, Sindh Forest Department, Forest Campus, Jinnah Avenue, Model Colony, Karachi, Pakistan

Contacts:

Telephone: +9221-34503022; Cell: +923463860351; Email: agha.tahir@gmail.com

Summary:

The TPL Team briefly explained the purpose of the meeting and the IFC queries related to the project. Mr. Agha Tahir welcomed the project.

There is no current 'Forest management Plan for Coastal Areas'. A twenty year perspective plan dating back to 1985 was prepared under Mr. Tahir Qureshi (formerly of the Sind Forest Department and now serving with IUCN) but it has not been revised or updated since. The ownership of the coastal creek areas have been divided amongst the ports (Karachi and Port Qasim), Sindh Board of Revenue and the Sindh Forest Department but the clear lines of demarcation could not be obtained. The land area of the project site maybe under the area assigned to Port Qasim or the Sind Forest Department. It was clarified that this is not a concern for the sponsors as the land has been allocated by Alternative Energy Development Board (AEDB), who has obtained the lease for this land from the Government of Sindh.

There were no immediate concerns identified by the Forest Officer as there are no ongoing or currently identified projects of his department in the project area. He requested the land coordinates for the site area so he could ensure this and these were duly forwarded to him. He indicated that heterogeneous mangrove plantation would be possible in the site area, should the project sponsors plan to look into this aspect. He expressed the need for an Integrated Coastal Zone Management Plan (ICZMP) since the last one expired in 2005 and currently there is no long term plan activity. He has promised to advice of any likely activity of the Sind Forest Department in the project area.

3.2 Meeting with IUCN

IUCN Team: Mr. Tahir Qureshi (Senior Advisor Coastal Ecosystem), Mr. Ateeq Ahmed (Country Manager Finance) and Ms. Zeevar Scheik (Program Officer)

Date: 18th November, 2011

Venue: 1 Bath Island Road, Karachi, Pakistan

Contacts:

Telephone: +92 21 3586 1540; Fax: +92 21 3583 5760 / 3586 1448;

Cell: +923458284862; Email: tahir.qureshi@iucn.org

Summary:

The IUCN team was appreciative of the environmentally benign nature of the project. The question regarding the ownership of the project area was raised by the IUCN team members, to which TPL team explained that Alternative Energy Development Board (AEDB) leased the land parcel to the project owners. Previous ownership of the land is not a concern of the project owners, as any liability in this regard would be for the AEDB to address and not in the purview of the project sponsors.

Mr. Tahir Qureshi shared his experiences specifically in the area surrounding the project. Some of the concerns he pointed out were related to the general behavior of the local population. He highlighted that it should be made sure that locals are not affected by the project, especially womenfolk. Any intrusion in their pathways or any hindrances caused for the fishing in the region has to be avoided to the extent possible. TPL team briefed him, that the concerns have already been addressed and made part of the Environmental Management Plan (EMP), moreover, it was also explained by the TPL team that the only possible hindrances (if any) caused will be during the construction period.

Mr. Tahir Qureshi indicated that many years ago, the project area surroundings used to be a mangrove habitat, and prospects of re-forestation in the area could be attempted. Dr. S. A. Ghalib of the TPL team clarified that the project land and surrounding is now mostly barren 'waste' land and re-forestation of mangroves attempts would probably not be successful. He suggested that cultivation could be further promoted under the project aegis in areas where mangroves plantation is already taking place to which the IUCN team agreed. Some other suggestions given by the IUCN team for environmental uplift of the area were:

- Fresh drinking water is usually in short supply in these areas and efforts could be made on part of the project proponents to ensure fresh drinking water supply in the area;
- Construction of Storm Shelters where the local population and their livestock could seek refuge during storms and cyclones and these could serve as community centers during normal periods;
- Other community development programs in the area could be related to improving the fishing prowess of the local community.

3.3 Meeting with Sindh Wildlife Department

Name: Mr. Adnan Khan

Date: 22nd November, 2011

Venue: Din Muhammad Wafai Road Opp. PIA Booking Office, Karachi, Pakistan

Contacts:

Telephone: +92 21 99204952; Fax: +92 21 99204959

Summary:

Mr. Adnan Khan was concerned about the site location being in the vicinity of any protected area. The site coordinates had been provided to him and checked against the master records maintained in Islamabad. A map of the area showing the protected areas is presented in **Figure 2 of Appendix A**. He said that based on the records the project area was outside any identified boundaries. He was investigating the demarcation of the Mirpur Sakro Game Reserve from the Gazette notifications and would verify the same to us once he has had the opportunity to do so. He indicated that a site visit may be required to delineate the area on the ground. He said he would be getting back to us by the end of the first week in December 2011. He said there were no other concerns of his department with respect to the project.

3.4 Meeting with Zoological Survey Department

Name: Mr. Abrar ul Hassan

Date: 23rd November, 2011

Venue: Zoological Survey Department, Block No. 67, Pakistan Secretariat, Shahr-e-Iraq, Karachi, Pakistan

Contacts:

Telephone: +92 21 99203334; Email: mbrl3334@hotmail.com

Summary:

Mr. Abrar ul Hassan said he was familiar with the area but it was not a target area for their activities as no sensitive species cetaceans or birds including the likes of dolphins, porpoises or crab plover dwell in the immediate vicinity of the site area.

His recommendations for community development options for the area included a marine culture training and development program and self-employment plans for the communities living in the site surroundings. Hatcheries for small shrimps and mud crabs were likely to be more feasible.

3.5 Meeting with Word Wildlife Fund (WWF)

WWF Team: Mr. Umeed Khalid and Mr. Subhash

Date: 29th November, 2011

Venue: Karachi Office (Conservation) 606-607 Fortune Center 6th Floor, Block 6.
PECHS, Shahrah-e-Faisal, Karachi, Pakistan

Contacts:

Telephone: +92 21 34544791/92; Fax: +92 21 34544790; Email:
ukhalid@wwf.org.pk

Summary:

The WWF staff advised us to ensure whether the project area was part of the Indus Delta Ramsar site or other protected area. The TPL team briefed them that the area is not located in any Ramsar Site or protected area to the best of our knowledge and the project proponents are verifying this through the concerned departments. A map of the delineated Indus Delta Ramsar site was provided. They wanted to know whether the project area fell within the routes of any migratory bird fly paths and whether any system would be in place to record bird hits. They were advised that this is already included in the Environmental Management Plan. No other point of concern regarding any environmental aspect was identified by WWF.

Mr. Umeed Khalid also suggested including re-forestation of mangroves, not necessarily on the project area, as possible means of environmental upgrade of the area. He also recommended that bird hit counts especially during the migration season should be recorded. He also suggested investigating prospects of use of sonic devices that could dispel birds from approaching the towers and from hitting the blades of the wind turbines.

4. Conclusion

On the basis of the overall impact assessment, more specifically, nature and magnitude of the residual environmental and socioeconomic impacts identified during the initially approved IEE and as updated and revised by this Supplement, it is concluded that the proposed project is unlikely to cause any significant, lasting impact on the social, physical and biological environment of the area, provided that the proposed activities are carried out as mentioned in the IEE report and this Supplement, and the mitigation measures included in this report are completely and effectively implemented.

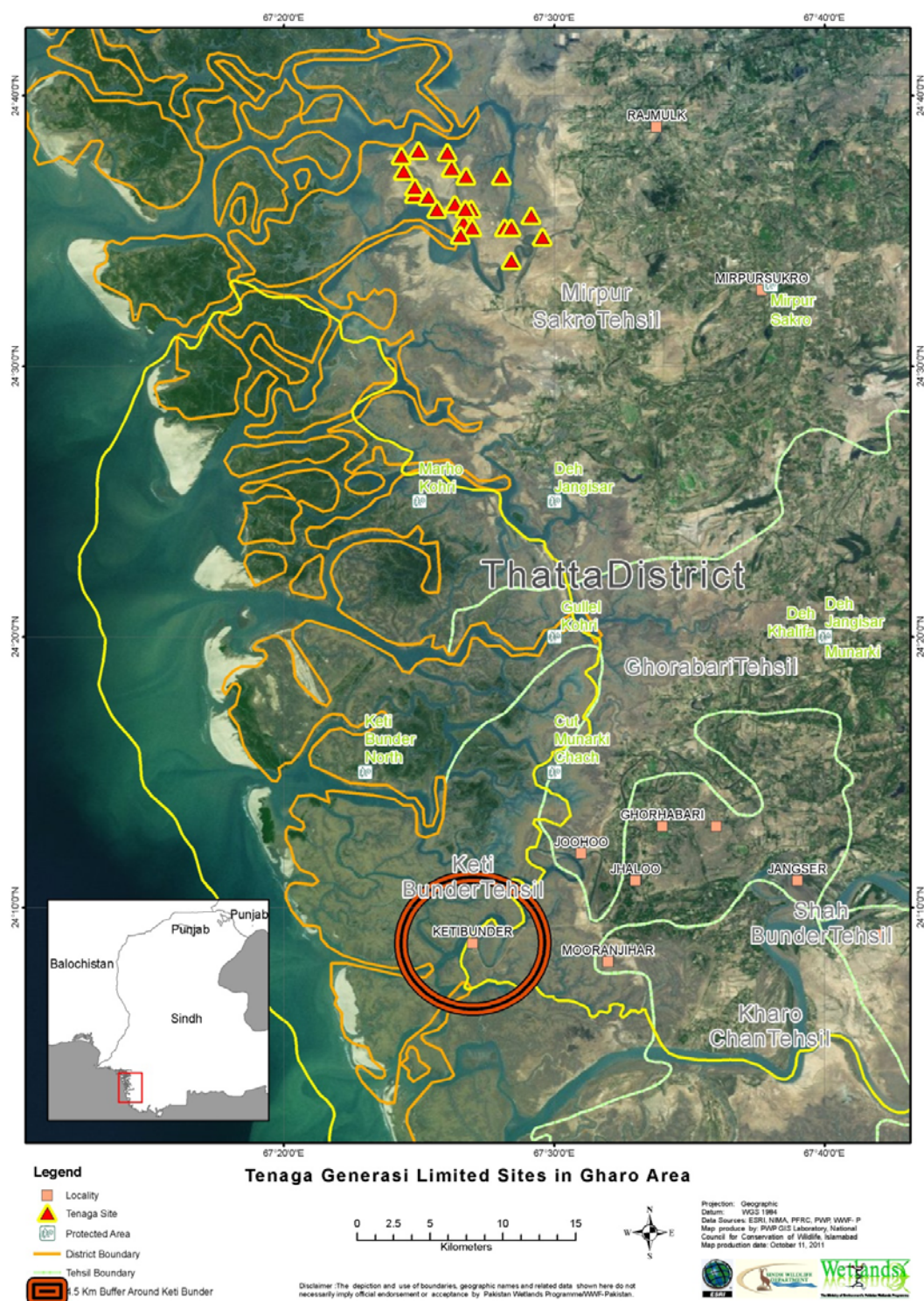
The Environmental Management Plan (EMP) has been revised after taking into consideration the change in the approach route to the site and recommendations of the aforementioned organizations. The revision is attached in **Appendix B**.

Appendix A: Figures

Figure-1



Figure-2



Appendix B: Environmental Management Plan (EMP)

8. Environmental Management Plan (Revised)

This Chapter presents the implementation mechanism – in the form of an environmental management plan (EMP) - for the environmental and social mitigation measures identified during the present IEE, and reported in **Chapter 7** of this document.

8.1 Purpose and Objectives of EMP

This EMP provides the delivery mechanism to address the adverse environmental as well as social impacts of the proposed project during its execution, to enhance project benefits, and to introduce standards of good practice to be adopted for all project works.

The specific objectives of the EMP are to:

- Define the responsibilities of the project proponents, contractors, and environmental monitors, and provide a means of effectively communicating environmental and social issues among them,
- Define the implementation mechanism for the mitigation measures identified during the present study.
- Define the monitoring mechanism and identify monitoring parameters in order to:
 - ▶ Ensure the complete implementation of all mitigation measures, and
 - ▶ Ensure the effectiveness of the mitigation measures.
- Provide the mechanism for taking timely action in the face of unanticipated environmental or social situations,
- Identify environmental as well as social training requirements at various levels.

8.2 Components of the EMP

The EMP consists of the following:

- ▶ Institutional Arrangements
- ▶ Mitigation plan
- ▶ Monitoring plan
- ▶ Change management plan
- ▶ Communication and documentation
- ▶ Environmental and social trainings,
- ▶ Public disclosure requirements
- ▶ Budgetary estimates for EMP implementation.

These are discussed in **Sections 8.3 to 8.10** below.

8.3 Institutional Arrangements

This section describes the organizational structure required for managing the environmental as well as social aspects of the proposed project. Also defined in this section are the roles and responsibilities of the various role players during the project.

8.3.1 Management Approach

TGL will establish the Environment, Health and Safety Department (EHSD) within the Organization, in order to handle the environmental, social, occupational health and safety aspects during different phases of the proposed project.

Other essential features of the institutional arrangement proposed for the project are:

- TGL will appoint the EHS Supervisor (EHSS) for overseeing and monitoring the entire implementation of the EMP and IEE.
- In case TGL appoints Supervision Consultant, the EHSS will be appointed by the Consultant (instead of TGL).
- The EMP as well as environmental management requirements and specifications will be included in all contracts TGL executes.
- The contractor(s) will be required to appoint a dedicated field EHS Monitor (EHSM) at the project site.
- TGL, through the EHSD, will cooperate with regulatory agencies (such as the Sindh EPA) and other stakeholders who may want to send their own teams to monitor the project activities.
- During the O&M phase of the project, the EHSD will be responsible for the environmental, social, safety and occupational health aspects of the site activities.

8.3.2 Organizational Structure and Responsibilities

Construction Phase

The organizational structure for the construction phase EMP is shown in **Exhibit 8.1**, and its salient features described below.

Primary responsibilities:

- ▶ The TGL through its Chief Executive Officer will be responsible for the project's compliance with the IEE and EMP throughout the project. The EHSD will assist the Chief Executive and will provide policy support in all environment and socioeconomic, occupational health and safety matters.
- ▶ The Supervision Consultant (if TGL chooses to employ one) through its Resident Engineer (RE) will be responsible for ensuring that the contractor(s) adhere to the quality requirements and other commitments including implementation of the EMP and IEE.
- ▶ The contractors' Chief Executive Officers or Country Managers will assume the main responsibility for all EHS and social matters pertaining to their works.
- ▶ TGL will coordinate with relevant government departments (Sindh EPA) and other stakeholders through the EHSD.

Field management and quality control:

- ▶ Carrying out construction activities in an environmentally and socially sound manner during the construction phase will be the responsibility of the site managers of the contractor(s).

- ▶ The TGL's site in-charge (or RE, if the Supervision Consultant is employed) will be responsible for the EHS and social soundness of all construction activities.

On-the-job supervision and monitoring:

- ▶ The EHSM of the contractor(s) will be responsible for the implementation of the EMP during construction works. He will also be responsible for communication with and the training of their respective construction and camp crews in all aspects of the EMP.
- ▶ The TGL's EHSS will ensure implementation of the EMP in the field. S/He will also coordinate with the TGL's site in-charge, the contractor's project management and EHSM of each contractor. The EHSS will be part of TGL's site organization if no Supervision Consultant is employed. Otherwise, S/he will be part of the Supervision Consultant's site staff.
- ▶ If any monitoring teams from government departments or from NGOs visit the field during the field activities, the EHSS will be responsible for coordinating their visits.

The roles and responsibilities of TGL's and contractors' personnel are summarized in **Exhibit 8.2**.

Operation Phase

During the operation phase of the proposed project, EHS and socioeconomic management will become a routine function, as an integral part of the O&M activities. The EHSD will be the focal point for all matters relating to EHS and socioeconomic aspects during the routine operations of the power plant. The EHSD will advise various departments within TGL on the EHS and socioeconomic matters. In addition, the EHSD will develop and implement the EHS and socioeconomic management system for the Company, defining roles and responsibilities of various departments and their respective staff.

8.4 Mitigation Plan

The mitigation plan is a key component of the EMP. It lists all the potential effects of each activity of the project and their associated mitigation measures identified in the IEE. For each project activity, the following information is presented in the plan:

- A listing of the potential impact associated with that project activity,
- A comprehensive listing of mitigation measures (actions),
- The person(s) responsible for ensuring the full implementation of the action,
- The person(s) responsible for monitoring the action,
- The timing of the implementation of the action to ensure that the objectives of mitigation are fully met.

The mitigation plan for the construction phase of the proposed project is presented in **Exhibit 8.3**.

It should be emphasized that the mitigation measures will have to be translated into environmental as well as social requirements and specifications to be made part of the contracts for the construction activities, with legal binding.

8.5 Monitoring Plan

The objective of environmental and social monitoring during the various phases of the proposed project will be as follows:

- Ensuring that the mitigation measures included in the IEE are being implemented completely.
- Ensuring the effectiveness of the mitigation measures in minimizing the project's impacts on social and environmental resources.

To achieve these objectives the following monitoring program will be implemented.

8.5.1 Compliance Monitoring

The compliance monitoring of the project activities is principally a tool to ensure that the environmental and social control measures identified in the IEE are strictly adhered to during the project activities.

Various aspects of the IEE compliance monitoring will be to:

- Systematically observe the activities undertaken by the contractors (and sub-contractors) or any other person associated with the project.
- Verify that the activities are undertaken in compliance with the IEE and EMP.
- Document and communicate the observations to the concerned person(s) of the contractors and TGL's EHSD, so that any corrective measures, if required, can be taken in a timely fashion.
- Maintain a record of all incidents of environmental and social significance, related actions and corrective measures.
- Maintain contact with the communities, solicit their views and concerns, and discuss them during the fortnightly meetings.
- Prepare periodic reports of the environmental and social performance of project.

The mitigation plan discussed in **Section 8.4** will be used as a management and monitoring tool for compliance monitoring. Inspection will be done using checklists prepared by the respective contractors, on the basis of the **Exhibit 8.3**, during the construction phase.

Compliance monitoring will be the responsibility of all organizations involved in the field activities, i.e., TGL and the contractors. It will be carried out by the following:

- EHS Supervisor
- EHS Monitor.

8.5.2 Effects Monitoring

The IEE predicts the impacts of the proposed project on the basis of information available at the time of conducting the assessment and the natural processes that link various environmental and social parameters. Based on this prediction, mitigation measures are introduced such that the predicted residual effects do not exceed acceptable levels. However, there is always an element of uncertainty in such predictions due to an insufficient grasp of the processes, limitations in prediction techniques, or inadequate data on the environment/social aspects. Consequently, it is

possible that even if the mitigation measures are implemented fully, the negative impacts of the project will exceed acceptable limits.

In order to address the above concerns, effects monitoring will be undertaken during the project activities, with the overall objective of proper management of environmental and social risks and uncertainties. Broadly, effects monitoring has the following objectives:

- To verify that the impacts of the proposed project are within acceptable limits, thus establishing credibility (public assurance).
- To immediately warn the project proponents (and the regulatory agencies, if required) of unanticipated adverse impact or sudden changes in impact trends so that corrective actions can be undertaken, which may include modifications in the proposed activities, or the inclusion of modified or additional mitigation measures.
- To provide information to plan and control the timing, location, and level of certain project activities so that the effects are minimized.
- To facilitate research and development by documenting the effects of the proposed project that can be used to validate impact-prediction techniques and provide a basis for more accurate predictions of future projects.

The effects monitoring plan is provided in **Exhibit 8.4**. The detailed methodologies will be developed during the detailed design phase of the project, when the specific information on field activities will be known. The effects monitoring will be carried out for the following parameters:

- Soil erosion
- Water quality
- Species mortality and loss of habitat
- Noise
- Damage to infrastructure
- Socioeconomic aspects
- Grievance redress system.

In addition, contact will be maintained with the communities, their views and concerns solicited. The outcome of these consultations will be discussed during the fortnightly meetings at the site.

8.5.3 External Monitoring

In addition to the compliance and effects monitoring discussed above, TGL will engage an independent consultants to carry out external monitoring on periodical basis. The objectives of this external monitoring will be to ensure that:

- the EMP is being adequately implemented,
- mitigation measures are being implemented,
- the compliance and effects monitoring are being conducted,
- environmental and social trainings are being conducted, and
- complete documentation is being maintained.

The external monitoring consultants will periodically visit the project site, examine the compliance monitoring activities, review the documentation maintained at the site, interview key site staff, make spot checks, take photographs where necessary, and meet with the communities. After each external monitoring visit, the consultant will prepare a monitoring report and submit to TGL. The report will include the observations made during the visits, highlight non-compliances observed, if any, salient information obtained from communities, and make recommendations.

8.6 Communication and Documentation

An effective mechanism for recording, storing and communicating environmental and social information during the project is an essential requirement of an EMP. The key features of such a mechanism are:

- Recording and maintaining all information generated during the monitoring in a predetermined format.
- Communicating the information to a central location.
- Storing raw information in a central database.
- Processing the information to produce periodic reports.

A description of the various components of the communication and documentation system is given below.

8.6.1 Data Recording and Maintenance

The forms to be used for recording information during the environmental and social monitoring will be developed by the EHSD. These forms will follow a standard format, which will correspond to the database into which all the information gathered will be placed. All common fields will have identical formats in the database and on the forms. Check boxes will be used as much as possible for ease in filling out the forms and to facilitate data entry.

All forms will be numbered and a tracking system will be developed for each. Whenever a form is released for use in the field, its number will be recorded. The field staff will be required to account for each form after completion. In this manner, it will be ensured that all forms are returned to the office.

8.6.2 Meetings

The following environmental meetings will take place during the project:

- Project initiation meetings (once for each of the contractors).
- Fortnightly meetings.¹

The purpose of the project initiation meetings will be to discuss the EMP, and ensure full understanding and commitment from concerned parties for its implementation.

The periodic meetings will be held at site during the construction phase. The purpose of the meetings will be to discuss the conduct of the operation, non-compliances noted by the EHSS or Contractors' EHSMs, and any EHS / social issues identified in the field. The remedial measures will also be discussed and agreed during these meetings. The meeting will be recorded in the form of an EHS report prepared by the EHSS.

¹ Frequency of meetings may be adjusted per the situation.

8.6.3 Grievance Redress Mechanism

An attempt has been made during the present IEE to identify all potential impacts of the proposed project, to provide mitigation measures to address the potential impacts, and to chart out a mechanism to implement these mitigation measures.

However during the project implementation, the stakeholders (mostly the communities in the vicinity of the project site) may still have some grievances with respect to the project activities, their impacts, compensation and other mitigation measures.

In order to address the above eventualities, the Grievance Redress Mechanism (GRM) has been devised. The main objective of the GRM will be to provide a mechanism to mediate conflict and cut down on lengthy litigation, which often delays the projects such as the TGL wind power plant. It will also facilitate people who might have objections or concerns regarding the project activities, provide a public forum to raise their objections and through conflict resolution, address these issues adequately. The main functions of the GRM will be as follows:

- Provide a mechanism to the communities/other stakeholders to address the problems arising as a result of project activities,
- Record the grievance of the communities/other stakeholders, categorize and prioritize the grievances that need to be resolved,
- Determine and implement the mitigation actions to address the grievances,
- Report to the aggrieved parties about the developments regarding their grievances and the decision of the project authorities.

Under the GRM, the EHSS will maintain the Social Complaint Register (SCR) at the sites to document all complaints received from the local communities or any other stakeholder. The information recorded in the Register will include date of the complaint, particulars of the complainant, description of the grievance, actions to be taken, the person responsible to take the action, follow up requirements and the target date for the implementation of the mitigation measure. The register will also record the actual measures taken to mitigate these concerns.

As soon as a complaint is received, the EHSS will discuss it with the EHSM, and determine the remedial action. If required, consultations will also be undertaken with the contractor's site managers and TGL's site in-charge. Once the remedial action is decided, implementation responsibility as well as schedule will be determined.

The proposed remedial action will be documented in the SCR, with complete details (by whom and by when). The proposed remedial action will be shared with the complainant. Similarly, the actual action taken will also be documented in the Register and shared with the complainant. The complainant's views on the remedial action taken will also be documented in the Register.

The SCR will be reviewed during the fortnightly meetings at the site during the project, and the action items discussed. The progress on the remedial actions will also be reviewed during the meetings.

The Register will also be shared with the EHSD, on regular basis, for information and further action, if any.

The GRM's roles, responsibilities and implementation mechanism are explained in **Exhibit 8.5**.

8.6.4 Reports

The EHSS will produce periodic reports based on the information collected. These will include reports for:

- Project initiation meetings with each contractor,
- Fortnightly meetings,
- Non-compliances,
- Effects monitoring.

These reports will be shared with the contractors, TGL's site in-charge and TGL's EHSD. The reports will also be made available for review, to the external monitoring teams, and to any other stakeholders who visit the site.

In addition, the external monitoring consultant will prepare report for each monitoring visit.

At the end of the construction phase, a final report will also be prepared.

8.7 Environmental and Social Training

Environmental and social trainings will help to ensure that the requirements of the IEE and EMP are clearly understood and followed by all project personnel throughout the project period. The primary responsibility for providing training to all project personnel will be that of the EHSS. The environmental and social training program will be finalized before the commencement of the project, during the detailed design phase. The training will be provided to the TGL staff, the construction contractors, and other staff engaged for the project. Training will cover all staff levels, ranging from the management and supervisory to the skilled and unskilled personnel. The scope of the trainings will cover general environmental awareness and the requirements of the IEE and the EMP, with special emphasis on sensitizing the project staff to the environmental and social aspects of the area. **Exhibit 8.6** provides a summary of various aspects of the environmental and social trainings.

During the O&M phase of the project, these trainings will continue to be conducted by EHSD for all relevant staff of the Company.

8.8 Change Management

The present IEE has been carried out on the basis of the project information available at this stage. This is however possible that the changes are made in some components of the project, during the design and construction phases. In order to address the environmental and social implications of these changes, a simple framework has been devised, which is described in this section.

The change management framework recognizes the following three broad categories of the changes in the project:

- Category A changes,
- Category B changes, and
- Category C changes.

These categories are defined below.

8.8.1 Category 'A' Change

The 'Category A' change is one that will lead to a significant departure from the project described in the IEE and consequently requires a reassessment of the environmental and socioeconomic impacts associated with the change. In such an instance, TGL will be required to conduct a fresh IEE (or EIA) of the changed portion of the project, and send the report of this assessment to the relevant agencies for approval (Pak-EPA). Examples of such changes are provided below.

- Any works inside protected areas (see **Section 5.2.4** for the protected areas in Thatta district).
- Change in the power house site by more than 2 km of the location studied during the IEE. Or change in the site by less than 2 km but the new location has a higher environmental and/or social sensitivity.

8.8.2 Category 'B' Change

The category 'B' change is one that will entail project activities not significantly different from those described in the IEE, and may result in project effects with overall magnitude to be similar to the assessment made in this report. In case of such changes, the EHSS (with assistance from the EHSD) will be required to reassess the environmental and socioeconomic impacts of the activity, specify additional mitigation measures, if necessary, and report the changes to the relevant agencies (Contractors, Sindh EPA). Examples of such changes are provided below.

- Change in the power plant site by more than 500 m of the location studied during the IEE, but not exceeding 2 km, provided that the new location does not have environmental or social sensitivity more than the original area.
- Changing the construction camp location.

Such changes will necessitate site surveys for the revised power plant site or camp site, by the environmental and socioeconomic experts. A site specific assessment for any additional environmental as well as socioeconomic issues will need to be carried out. Complete record of the surveys and assessment will be maintained.

8.8.3 Category 'C' Change

A Category-C change is one that is of little consequence to the IEE findings. This type of change does not result in effects beyond those already assessed in the IEE. The only action required for such changes will be to record the change in the Change Record Register.

8.9 Public Disclosure

TGL will disclose this IEE and EMP to all the stakeholders before the commencement of the proposed project. The IEE report will be made available to the stakeholders at the sites designated by the EPA, in accordance with the national legislation (PEPA 1997). In addition, the executive summary of the IEE will be translated into Urdu language (and Sindhi language if necessary), and made available to the affected communities (and also kept at the project sites). This will ensure that the local communities are aware of the project, its key impacts, the mitigation measures and the implementation mechanism. In addition, the Executive Summary will be disclosed through the TGL's official website.

8.10 Cost of Environmental and Social Management

The primary component of the environmental and social management cost pertains to the personnel dedicated for EMP implementation. The other component relates to the environmental effects monitoring as discussed in **Section 8.5.2** and tabulated in **Exhibit 8.4**. The cost of mitigation measures detailed in **Exhibit 8.3** is completely integrated with the construction costs, and cannot be separated. The mitigation measures should be made part of the project design and hence included in the overall project cost. **Exhibit 8.7** provides the cost estimates for the environmental and social management of the proposed project.

Exhibit 8.1: Organizational Structure for Environmental and Social Management (Construction Phase)

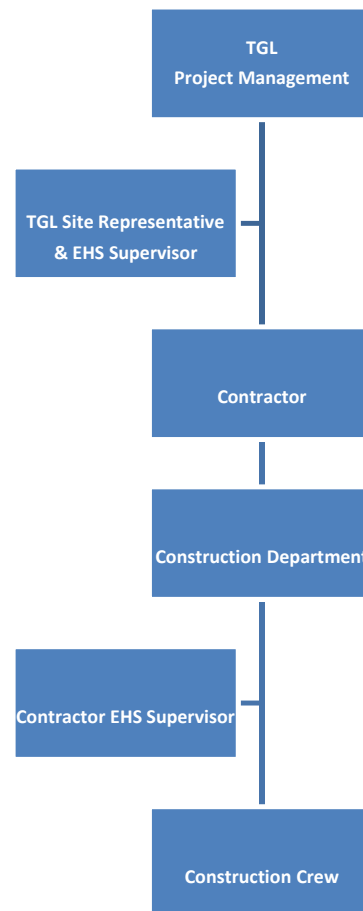


Exhibit 8.2: Roles and Responsibilities

Organization	Designation	Responsibilities
TGL	EHS Department	- Advise various TGL departments on matters relating to EHS and social aspects of the project. - Advise and support EHS Supervisor for the implementation of IEE and EMP.
	Site Incharge	- Fulfill TGL's obligations as laid out various project documents. - Ensure that the construction is carried out within the agreed timeframe according to satisfactory EHS and technical standards.
	EHS Supervisor	- Ensure that the entire project is conducted in an environmentally friendly and socially sound manner. - Ensure compliance with all relevant environmental laws. - Facilitate full implementation of EMP and IEE requirements during the project. - Assist the Site In-charge in fulfilling TGL's environmental and social responsibilities, and keep them updated on environmental and social matters relating to the construction. - Review environmental and social reports, and ensure implementation of corrective measures, if any. - Coordinate with other stakeholders, including relevant EPAs.
Contractors	Site Manager	- Manage construction activities, manage construction crew, camp crew and other site personnel, in an environmentally and socially responsible manner; - Liaise with TGL's Site In-charge.
	EHS Monitors	- Manage implementation of entire EMP, including the mitigation plan; - Report regularly to Site Manager; - Liaise with TGL's EHS Supervisor; - Provide environmental and social training to construction crew.

Exhibit 8.3: Mitigation Plan

	Project Activities		Impact	Action	Responsibility		Timing
					Execution	Monitoring	
1	Design Considerations	1.1	Soil Erosion	- The foundations of wind turbine tower will be appropriately designed to avoid any soil erosion. - The site roads will be designed appropriately to avoid any shoulder erosion.	TGL	EHSD	BC
		1.2	Soil and water contamination	- Appropriate waste disposal systems (warehouse/workshop wastes, domestic sewage, and domestic solid waste) will be included in the design of the power plant and associated facilities. - The transformer procured for the proposed project will be PCB-free. - Leaked oil collection arrangement (such as a channel and a drain pit below the transformers) will be incorporated in the design of the transformer foundations.	TGL	EHSD	BC
		1.3	Loss of natural vegetation and threat to wildlife	- The waste disposal systems mentioned above will ensure that no contaminated effluents/solid wastes end up in the creek channels. - Any plantation carried out at the site will be carried out after obtaining expert advice; generally, only indigenous species will be planted. - Plantation of mangroves along the creek channels is recommended.	TGL	EHSD	
		1.4	Aesthetic value	- The turbine will be painted a uniform color, while observing marine and air navigational marking regulations; - Lettering, company insignia, advertising, or graphics on the turbines will be avoided. - The plantation mentioned above will also enhance the aesthetic value of the area.	TGL	EHSD	

Exhibit 8.3: Mitigation Plan (Cont'd.)

	Project Activities		Impact	Action	Responsibility		Timing
					Execution	Monitoring	
2	Contractor Mobilization and Demobilization	2.1	Soil Erosion and Contamination; Water Contamination	- The IFC's EHS Guidelines will be strictly followed. - Operation of vehicles and machinery close to the creek channels will be minimized. - Vehicles and equipment will not be repaired in the field. If unavoidable, impervious sheathing will be used to avoid soil and water contamination.	Contractors	EHS Monitor	BC AC
		2.2	Air Quality Deterioration	- The IFC's EHS Guidelines will be strictly followed. - Construction machinery and vehicles will be kept in good working condition and properly tuned, in order to minimize the exhaust emissions. The vehicle exhaust will comply with the NEQS (Exhibit 2.3). - Fugitive dust emissions will be minimized by appropriate methods, such as spraying water on soil, where required and appropriate.	Contractors	EHS Monitor	BC AC
		2.3	Noise	- The IFC's EHS Guidelines will be strictly followed. - Vehicles will have exhaust mufflers (silencers) to minimize noise generation. Vehicle noise will comply with NEQS (Exhibit 2.3). - Nighttime traffic will be avoided near the communities. Local population will be taken in confidence if such work is unavoidable.	Contractors	EHS Monitor	BC AC
		2.4	Safety Hazards	- The IFC's EHS Guidelines will be strictly followed - Road signage will be fixed at appropriate locations to reduce safety hazard associated with project-related vehicular traffic. - Project drivers will be trained on defensive driving.	Contractors	EHS Monitor	BC AC

Exhibit 8.3: Mitigation Plan (Cont'd.)

	Project Activities		Impact	Action	Responsibility		Timing
					Execution	Monitoring	
		2.5	Damage to Infrastructure	- The IFC's EHS Guidelines will be strictly followed - All damaged infrastructure will be restored to original or better condition.	Contractor	EHS Monitor	BC DC
		2.6	Gender Issues	- The IFC's EHS Guidelines will be strictly followed - Strict code of conduct will be maintained. Local norms will be respected.	TGL	EHS Monitor	DC AC
3	Construction Camp Establishment and Operation	3.1	Soil Erosion / Contamination; Water contamination	- The IFC's EHS Guidelines will be strictly followed - The construction camps site will be selected after obtaining TGL's approval. - Camps will not be established close to the creek channels. - Photographs will be taken to record the site conditions prior to the establishment of the camp. - Land clearing, leveling and grading will be minimized, and carried out in a manner to minimize soil erosion. - Vehicular traffic on unpaved roads will be avoided as far as possible. - Operation of vehicles close to the creek channels will be minimized. - Contractors will prepare a waste disposal plan and submit to EHS Supervisor for his approval. - The camp will have appropriate treatment and disposal system with adequate capacity for domestic sewage. - Waste oils will be collected in drums and sold to the recycling contractors. - The inert recyclable waste from the site (such as card board, drums, broken/used parts, etc.) will be sold to recycling contractors. The hazardous waste will be kept separate and handled according to the nature of the waste. - Domestic solid waste from the construction camp will be disposed in a manner that does not cause soil or water contamination.	Contractor	EHS Monitor	BC DC

Exhibit 8.3: Mitigation Plan (Cont'd.)

Project Activities	Impact	Action	Responsibility		Timing
			Execution	Monitoring	
		- No wastes will be released into the creek channel. - The camp sites will be completely restored after the completion of the construction works. All temporary structures will be demolished, land leveled and re-contoured to the original condition or better. All debris and any other material will be removed from the site. The photographs taken prior to the camp establishment will be used to restore the area.			
	3.2 Air Quality Deterioration	- The IFC's EHS Guidelines will be strictly followed - Generators and vehicles will be kept in good working condition and properly tuned, in order to minimize the exhaust emissions. - Fugitive dust emissions will be minimized by appropriate methods, such as spraying water on soil, where required and appropriate. Waste water from kitchen and washing area of the construction camp may be used for water spraying.	Contractors	EHS Monitor	BC DC
	3.3 Water Consumption	- Water will be obtained from the source approved by the EHS Supervisor. - Astute planning will be employed to conserve water at the construction sites and camp. Water will be procured in a manner that least affects the local communities. Waste water recycling will be carried out for sprinkling and gardening purposes.	Contractors	EHS Monitor; EHS Supervisor	DC
	3.4 Loss of Vegetation	- The IFC's EHS Guidelines will be strictly followed - Clearing natural vegetation will be avoided as far as possible.	Contractors	EHS Monitor	BC DC
	3.5 Noise	- The IFC's EHS Guidelines will be strictly followed. - Generators and vehicles will have exhaust mufflers (silencers) to minimize noise generation. The noise levels measured at the camp periphery will meet the WB/IFC standards.	Contractors	EHS Monitor	BC DC

Exhibit 8.3: Mitigation Plan (Cont'd.)

	Project Activities		Impact	Action	Responsibility		Timing
					Execution	Monitoring	
4	Transportation of Equipment and Construction Materials	3.6	Safety Hazards	- The IFC's EHS Guidelines will be strictly followed - Protective fencing to be installed around the Camp to avoid any accidents. - Firefighting equipment will be made available at the camps. - The camp staff will be provided firefighting training. - All safety precautions will be taken to transport, handle and store hazardous substances, such as fuel.	Contractors	EHS Monitor	BC DC
		3.7	Public Health	- The IFC's EHS Guidelines will be strictly followed - The construction camps and site offices will have first-aid kits. - The construction crew will be provided awareness for the transmissible diseases (such as HIV/AIDS, hepatitis B and C).	Contractors	EHS Monitor	BC DC
		3.8	Social and Gender Issues	- The IFC's EHS Guidelines will be strictly followed - Construction crew will avoid entering the villages and settlements. - No child labor will be employed.	EHS Monitor	EHS Supervisor	BC DC
		4.1	Soil Erosion and Contamination; Water Contamination	- The IFC's EHS Guidelines will be strictly followed - Vehicles and equipment will not be repaired in the field. If unavoidable, impervious sheathing will be used to avoid soil and water contamination.	Contractors	EHS Monitor	DC
		4.2	Air Quality Deterioration	- The IFC's EHS Guidelines will be strictly followed - The project vehicles will be kept in good working condition and properly tuned, in order to minimize the exhaust emissions. The vehicle exhaust will comply with the NEQS (Exhibit 2.3). - Fugitive dust emissions will be minimized by appropriate methods, such as spraying water on soil, where required and appropriate.	Contractors	EHS Monitor	BC; DC

Exhibit 8.3: Mitigation Plan (Cont'd.)

Project Activities		Impact	Action	Responsibility		Timing
				Execution	Monitoring	
	4.3	Noise	▪ The IFC's EHS Guidelines will be strictly followed ▪ Vehicles will have exhaust mufflers (silencers) to minimize noise generation. The vehicle noise will comply with the relevant NEQS. ▪ ▪ The noise levels will comply with the WB standards.	Contractors	EHS Monitor	BC; DC
	4.4	Safety Hazards	▪ The IFC's EHS Guidelines will be strictly followed ▪ Road signage will be fixed at appropriate locations to reduce safety hazard associated with project-related vehicular traffic. ▪ Project drivers will be trained on defensive driving. ▪	Contractors	EHS Monitor	DC
	4.5	Damage to Infrastructure	▪ All damaged infrastructure will be restored to original or better condition.	Contractors	EHS Monitor	BC DC

Exhibit 8.3: Mitigation Plan (Cont'd.)

	Project Activities		Impact	Action	Responsibility		Timing
					Execution	Monitoring	
5	Construction Activities	5.1	Land Acquisition	- The entire land acquisition process will be properly documented. - Grievance redress mechanism will be put in place to address the community complaints.	TGL	EHS Supervisor	BC
		5.2	Noise and Vibration	- The IFC's EHS Guidelines will be strictly followed. - Liaison with the community will be maintained. Grievance redress mechanism will be put in place to address the community complaints, as stated earlier.	Contractor	EHS Monitor	DC
		5.3	Safety Hazards	- The IFC's EHS Guidelines will be strictly followed. - The construction sites will have protective fencing to avoid any unauthorized entry. - Before commencing the testing commissioning of the system, the nearby communities will be informed. Protective fencing will be used where appropriate/possible. - The project vehicles will have fire extinguishers. - The site staff will be provided firefighting training.	Contractor	EHS Monitor	DC
		5.4	Social Issues	- The IFC's EHS Guidelines will be strictly followed. - Construction crew will avoid entering villages and settlements. - Local social norms and practices will be respected. - No child labor will be employed at sites.	Contractor	EHS Monitor	DC
		5.5	Sites of Historical, Cultural, Archeological or Religious Significance	- The IFC's EHS Guidelines will be strictly followed. - In case of discovery of any sites or artifacts of historical, cultural, archeological or religious significance, the work will be stopped at that site. The provincial and federal archeological departments will be notified immediately, and their advice will be sought before resumption of the construction activities at such sites.	EHS Monitor	EHS Supervisor	BC DC

Exhibit 8.3: Mitigation Plan (Cont'd.)

Project Activities		Impact	Action	Responsibility		Timing
				Execution	Monitoring	
	5.6	Soil Erosion	▪ Cut and fill at the proposed site will be carefully designed, and ideally should balance each other. The surplus soil, if any, will be disposed at places approved by TGL. Such sites will be selected after surveying the area and ensuring that soil deposition will not have any significant impacts, such as loss of productive land, blocked access, natural vegetation or disturbance to drainage. ▪ If necessary, fill material will be obtained from appropriate locations approved by TGL. Such locations will be selected after surveying the area and ensuring that soil extraction will not have any significant impacts, such as soil erosion, loss of natural vegetation or disturbance to drainage. ▪ If necessary, fill material will be obtained from appropriate locations approved by TGL. Such locations will be selected after surveying the area and ensuring that soil extraction will not have any significant impacts, such as soil erosion, loss of natural vegetation or disturbance to drainage. ▪ Areas from where the fill material is obtained or surplus soil deposited, will be landscaped to minimize erosion and hazard for people and livestock. ▪ Temporary embankments will be constructed where necessary to avoid any soil eroding into the creek channels. ▪ Operation of vehicles and machinery close to the creek banks will be minimized to the extent possible, to minimize soil erosion. ▪ Excavated soil will be protected against erosion caused by rain or wind. ▪ Photographic record will be maintained for pre-project, during-construction and post-construction condition of the site.	Contractors	EHS Monitor EHS Supervisor	DC

Exhibit 8.3: Mitigation Plan (Cont'd.)

Project Activities		Impact	Action	Responsibility		Timing
				Execution	Monitoring	
	5.7	Soil Contamination; Water Contamination	- Vehicles and construction equipment will not be repaired in the field. If unavoidable, impervious sheathing will be used to avoid soil and water contamination. - Waste oils will be collected in drums and sold to the recycling contractors. - The inert recyclable waste from the site (such as card board, drums, broken/used parts, etc.) will be sold to recycling contractors. The hazardous waste will be kept separate and handled according to the nature of the waste. - No waste effluents will be released into the creek channels without appropriate and adequate treatment. No solid waste will be thrown on the ground or in the creek water.	Contractors	EHS Monitor EHS Supervisor	DC
	5.8	Air Quality Deterioration	- Construction machinery, generators and vehicles will be kept in good working condition and properly tuned, in order to minimize the exhaust emissions. - Fugitive dust emissions will be minimized by appropriate methods, such as spraying water on soil, where required and appropriate.	Contractors	EHS Monitor	DC
	5.9	Damage to natural vegetation	- Tree plantation plan will be developed and implemented for the project site. Expert advice will be obtained for this purpose. - Indigenous tree species will be selected for plantation; Eucalyptus trees will not be used in any case. - Plantation of heterogeneous plants along the channel banks will be carried out, after obtaining expert advice. This will increase the biological value of the area on the one hand, and forestall any channel erosion, on the other.	TGL	EHS Monitor	BC DC AC

Exhibit 8.3: Mitigation Plan (Cont'd.)

	Project Activities		Impact	Action	Responsibility		Timing
					Execution	Monitoring	
		5.10	Threat to wildlife	- The IFC's EHS Guidelines will be strictly followed. - Measures to rehabilitate the floral resources of the area discussed above will also positively impact the wildlife resources of the area. No wastes or effluents will be released directly in the creek channels. Appropriate waste disposal systems, as described earlier will be implemented. - Garbage will not be left in the open. - Operation of project vehicles and construction machinery close to the channel banks will be minimized. The project staff will not be allowed to indulge in any hunting, trapping or fishing activities.	Contractor	EHS Supervisor	BC DC
6	Operation and Maintenance Activities	6.1	Safety hazards	- The IFC's EHS Guidelines will be strictly followed, as described earlier. - The plant sites will have protective fencing to avoid any unauthorized entry. - The project drivers will be trained for defensive driving skills. - Vehicular speeds near/within communities will be kept low to minimize safety hazards. - Firefighting equipment will be made available at the site. The project vehicles will have fire extinguishers. - The plant staff will be provided firefighting training. - All safety precautions will be taken to transport, handle and store hazardous substances, such as fuel. - Liaison with the community will be maintained.	Power plant staff	EHS Supervisor	During Operation and Maintenance (O&M)

Exhibit 8.3: Mitigation Plan (Cont'd.)

Project Activities		Impact	Action	Responsibility		Timing
				Execution	Monitoring	
	6.2	Species Mortality	- The IFC's EHS Guidelines will be strictly followed, as described above. - Appropriate storm water management measures will be implemented to avoid creating attractions such as small ponds which can attract birds and bats for feeding or nesting near the wind farm. - The towers and turbines will be made visible by using appropriate colors. - The towers will have light beacons to make them visible for the nighttime flying birds.	Power plant staff	EHS Supervisor	During O&M
	6.3	Habitat modification	- The IFC's EHS Guidelines will be strictly followed, as described earlier. - The habitat alteration will be limited to the footprint of the towers and buildings, and the site roads. - The expert advice will be obtained for any plantation carried out at the site. No exotic plant species will be introduced; only indigenous species will be planted. - Habitat improvement measures, such as planting mangroves at the outer boundary (facing the creek channels), will be taken, after obtaining expert advice.	Power plant staff	EHS Supervisor	During O&M
	6.4	Threat to marine fauna	- The IFC's EHS Guidelines will be strictly followed, as described above. - No waste effluents will be released directly in the creek channels. - Appropriate waste disposal systems will be implemented. - Garbage will not be left in the open, nor thrown in the creek water. - Off-road operation of project vehicles close to the channel banks will be minimized. - The project staff will not be allowed to indulge in any hunting, trapping or fishing activities.	Power plant staff	EHS Supervisor	During O&M
	6.5	Noise emissions	- Personnel protective equipment will provided to the site personnel. - Liaison with the nearby communities will be maintained in this regard.	Power plant staff	EHS Supervisor	During O&M

Exhibit 8.3: Mitigation Plan (Cont'd.)

Project Activities		Impact	Action	Responsibility		Timing
				Execution	Monitoring	
	6.6	Air quality deterioration	- The generator and vehicles will be kept in good working condition and properly tuned, in order to minimize the exhaust emissions. The exhaust emissions will comply with the NEQS. .	Power plant staff	EHS Supervisor	During O&M
	6.7	Soil and water contamination	- The IFC's EHS Guidelines will be strictly followed, as described earlier. - No waste effluents will be released to the environment without appropriate treatment. - The solid waste will not be thrown in the open or in the creek water. - The power plant and associated facilities will have appropriate solid waste collection and disposal arrangements. - The power plant and associated facilities will have appropriate sewage handling, treatment and safe disposal system. - Waste oils and chemicals will be disposed in accordance with their respective Material Safety Data Sheet (MSDS). MSDS will be made available at the power plant. - Non-toxic recyclable waste (such as cardboard) will be given away for recycling. - Toxic waste will be stored separately, and incinerated at an appropriate double chamber incinerator. - The power plant will have channels and drainage pits to collect any leaked oil from the transformers. This oil will be sent back to the workshop for recycling. - Any soil contaminated by the oil/chemical spillage will be removed and disposed off appropriately in accordance with the MSDS of the spilled oil/chemical.	Power plant staff	EHS Supervisor	During O&M

EHSD: Environmental Safety and Health Department

BC: Before Construction

EHSS: Environmental Safety and Health Supervisor
Operation and maintenance

DC: During Construction
AC: After Construction

O & M:

Exhibit 8.4: Effects Monitoring Plan for Construction and O&M Phases

No.	Monitoring Parameter	Monitoring Locations	Frequency ^a	Responsibility	Resource Requirement	Documentation
1	Visual observation of soil erosion	Construction sites, campsites	During routine monitoring	EHS Supervisor	-	Record of observations; Photographs.
2	Water quality	At the creek channels near the site	Before mobilization	Contractor/EHS Monitor	Sampling bottles	Complete record of sampling and analyses.
3	Water quality	At the creek channels near the site	Monthly (construction phase)	Contractor/EHS Monitor	Sampling bottles	Complete record of sampling and analyses.
4	Water quality	At the creek channels near the site	Once in two months (O&M phase)	EHS Supervisor	Sampling bottles	Complete record of sampling and analyses.
5	Water consumption	Construction sites, campsite	Daily	Contractor/EHS Monitor	-	Complete record
6	Visual checks for any damage to local infrastructure	Construction sites	During routine monitoring	EHS Supervisor	-	Record of observations; Photographs.
7	Visual checks for exhaust emissions	Construction sites, camp site	During routine monitoring	Contractor/EHS Monitor	-	Record of observations; Photographs.
8	Visual checks for dust emissions	Construction sites, camp site, project roads	During routine monitoring	Contractor/EHS Monitor	-	Record of observations; Photographs.
9	Noise	At nearby communities	Fortnightly or during the construction activities causing noise.	Contractor/EHS Monitor	Noise meter	Complete record of noise measurements, locations, etc.
10	Noise	At nearby communities	Once in two months during O&M phase.	EHS Supervisor	Noise meter	Complete record of noise measurements, locations, etc.

Exhibit 8.4: Effects Monitoring Plan for Construction and O&M Phases (Cont'd.)

No.	Monitoring Parameter	Monitoring Locations	Frequency ^a	Responsibility	Resource Requirement	Documentation
11	Public Grievances	At nearby communities	Throughout the field activities.	EHS Supervisor	Social Complaint Register	Complete record to be maintained in the form of the Social Complaint Register.
12	Visual observation of species Mortality	At the site	Daily	EHS Supervisor	-	Complete record of any speciers (eg, birds) mortality.

^a Frequency may be adjusted in the field according to the situation and results of the monitoring.

Exhibit 8.5: Grievance Redressal Mechanism

<i>Stage</i>	<i>Action</i>	<i>Action By</i>	<i>By When</i>	<i>Monitoring By</i>	<i>Notes</i>
Mobilization at site	Placement of Social Complaint Register (SCR) at the site office	EHS Monitor	At the time of site mobilization.	EHS Supervisor	The SCR will have separate columns for: i) date of complaint; ii) description of complaint; iii) particulars of complainant; iv) details of action required/decided; v) person(s) responsible to take action; vi) person(s) responsible to monitor the action; vii) details of action taken (when, by whom, where); viii) comments of the complainant after the action taken.
Complaint raised by any complainant	The complaint is recorded in the SCR.	EHS Monitor	-	EHS Supervisor	The relevant columns of the SCR are filled.
Identification of remedial action	A meeting is held between EHSM and EHSS, and if required with Site Incharge. The redial action is identified. The Site Incharge and EHSD are informed regarding the grievance and the remedial action identified.	EHS Monitor	Within 2 days of the new complaint.	EHS Supervisor	The relevant columns of the SCR are filled.
Implementation of remedial action	The remedial action is implemented	Contractors or TGL, depending upon the nature of the remedial measure	To be decided for each remedial action.	EHS Supervisor	The relevant columns of the SCR are filled.

Exhibit 8.5: Grievance Redressal Mechanism (Cont'd.)

<i>Stage</i>	<i>Action</i>	<i>Action By</i>	<i>By When</i>	<i>Monitoring By</i>	<i>Notes</i>
Feed back to the complainant	Information is provided to the complainant regarding the remedial action taken. The comments/observations of the complainant are obtained and documented.	EHS Monitor	Within 1 week of the action taken.	EHS Supervisor	The relevant columns of the SCR are filled.
Fortnightly site meetings	The SCR will be discussed.	EHS Supervisor	Fortnightly.	Site Incharge	The discussion will be documented in the minutes of meeting.
On monthly basis	The summary of SCR will be sent to EHS Department.	EHS Supervisor	Monthly.	EHS Department	-

Exhibit 8.6: Environmental and Social Trainings

Contents	Participants	Responsibility	Schedule
General environmental and socioeconomic awareness; Environmental and social sensitivity of the project area; Key findings of the IEE; Mitigation measures; EMP; Social and cultural values of the area.	Design team; Selected TGL management staff	EHS Department	Prior to the start of the project activities. (To be repeated as needed.)
General environmental and socioeconomic awareness; Environmental and social sensitivity of the project area; Mitigation measures; Community issues; Safety issues; Awareness of transmissible diseases Social and cultural values.	All site personnel	EHS Supervisor; EHS Monitors	Prior to the start of the field activities. (To be repeated as needed.)
EMP; Safety issues; Waste disposal	Construction crew	EHS Monitors	Prior to the start of the construction activities. (To be repeated as needed.)
Road safety; Defensive driving; Waste disposal; Cultural values and social sensitivity.	Drivers	EHS Monitors	Before and during the field operations. (To be repeated as needed.)
Camp operation; Waste disposal; Natural resource conservation; Safety Housekeeping.	Camp staff	EHS Monitors	Before and during the field operations. (To be repeated as needed.)
Restoration requirements; Waste disposal	Restoration teams	EHS Monitors	Before the start of the restoration activities.

**Exhibit 8.7: Cost of Environmental and Social Management
(During Construction Phase)**

	Description	Cost (Pak Rs.)	Basis
1	Environmental and Social Personnel		
	EHS Supervisor	900,000	18 months × 50,000 per month ^a
	EHS Monitors	0	To be included in the Contractor's cost
2	Environmental and Social Monitoring	450,000	18 samples; 5 locations; 5,000 per sample ^b
3	External Monitoring	240,000	4 × 2-day visits: (8 days). 8 days × 15,000 per day × 2 experts
4	Environmental and Social Trainings	440,000	11 training sessions × one-day duration; Rs 40,000 per training. ^c
8	Cost of land for power plant	0	The cost of land is included in the project cost.
9	Miscellaneous Expenses	500,000	Lump sum
10	Contingencies	76,000	About 3 % of the above
	Total	2,606,000	

^a The duration of the proposed project has been assumed as 18 months.

^b Frequency of analysis may be adjusted by EHS Supervisor on the basis of the previous results or sensitivity of area.

^c Frequency of the trainings may be altered per the requirements