Environmental Impact Assessment Report

INSTALLATION OF 132 KV GRID STATION BY PANTHAT TYRES LIMITED

District, Sheikhupura.

ELITE ENVIRONMENTAL SOLUTIONS

(Environmental Engineers & Consultants)

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EXECUTIVE SUMMARY

This executive summary presents an overview of the main findings of the Environmental Impact assessment (EIA) report for construction phase/Installation of 132 KV Grid Station by M/S Panther Tyres Limited, Located at 29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura, Pakistan". Total area of project is 9 Kanal & 1 Marla. The capacity of grid station will be 132 KV. The estimated cost of the project will be approx. 200 million rupees.

Grid stations will transform voltage from high to low through substation to provide continuous power to the consumers. For the construction of grid station, grid land already selected by site selection committee for Installation of 132 KV Grid Station.

Main equipment will include switch gear, isolator, lighting arrestor, circuit breakers, insulators, protective relays, switchyards, interconnecting transmission lines, autotransformers, switching stations, and step-down transformers.

This EIA is also to confirm the existing legislative frameworks that are specifically notified by the EPA, Punjab for the conservation of environment. Environmental Impact Assessment (EIA) has been conducted in accordance with the Punjab Environmental Protection Act, 1997 (Punjab amended, 2012) read with Review of IEE/EIA Regulations, 2020.

The proposed project falls under Schedule II A (3) of Review of IEE and EIA Regulations, 2000.

TITLE & LOCATION OF THE PROJECT

The title and location of the proposed project is as follows:

Title: Installation of 132 KV Grid Station by M/S Panther Tyres Limited, Located at 29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura".

Project land coordinates are as follows:

North: Lahore-Sheikhupura Road

South: Open Land

East: Population

West: Industry

NAME OF THE PROPONENT

Name: Mr. Mian Faisal Iftikhar S/O Mr. Mian Iftikhar Ahmed

Designation: CEO

Contact No.: 042-111554444

E-mail: info@panthertyres.com

Mailing Address: House No.18 B, Mohallah Officers Colony, Zarrar Shaheed Road, Lahore Cantt, District Lahore.

NAME OF ORGANIZATION PREPARING THE REPORT:

This Environmental Impact Assessment (EIA) report has been prepared by:

Elite Environmental Solutions Pvt Limited

Address: First Floor, House No. 12, V-Lane, Street No. 6, Cavalry Ground, Lahore.

Contact: 042-36620872, 0300-6509353.

A BRIEF OUTLINE OF THE PROPOSED PROJECT

A thorough study has been conducted to identify all the adverse environmental impacts and harms associated with the project during construction and operation phase, so there are no any significant adverse impacts on the nearby community and on environment. Overall, the project will have positive impacts on the local population and country as a whole. Moreover, area for plantation is also reserved for air purification within the project vicinity.

Name of the project:	Installation of 132 KV Grid Station
Location of the project:	29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura".
Proposed Area:	Total area proposed for the subject project is 9 kanal & 1 Marla.
Nature of Project:	Nature of the project is proposed. At the time of visit, project site was an open plot and no constructional activities had been started at the project site.
Capacity of project:	132 KV
Cost of the project:	Total cost of the project will be approx. 200 million rupees.
Project process:	Grid Station will transform voltage from high to low through substation to provide continuous power to the consumer.

Detail of Equipment (132KV Grid Station)	Main equipment will include line isolator, lighting arrestor, circuit breakers, insulators, protective relays, relay penal, earth mast, AC/DC Panel, control panel, earthing platform, conductors, earth wire, autotransformers, switching stations, and step-down transformers.
Labor/ Workforce:	During construction: 45-50 (estimated) During Operation: 10-20 (estimated)
Water Requirement:	3-4 m^3 /day
Solid waste:	Domestic Waste
Source of Power:	Grid Connection and stand by generators (400 KVA)
Source of Water:	Ground Water

Table: Summary of Environmental and social impacts of the project during the construction phase and mitigation measures suggested:

Aspect	Impact	Mitigation	Monitoring parameters	Location	Monitoring	Frequency monitoring	Responsibility
Construction phase							
Air	Health effects, Reduced visibility on roads	Sprinkling of water, Tuning of construction vehicles & machines, Dust masks for laborers	Particulate Matter Smoke CO, Sox	All project locations	Vehicular emissions Dust Ambient air quality	Monthly for emissions and daily for dust	HSE Manager/ Proponent
Noise	Stress Hypertension Hearing Loss, Headache	Avoid working at night Lubrication of construction vehicles Provision of Ear plugs	Noise levels	Project location close to residential areas	Noise monitoring device		HSE Manager/ Proponent
Land & Soil	Erosion due to excavation Formation of pits due to improper backfilling	Proper backfilling and stone pitching around the excavated site if required	Surface topography	All project locations	Visual assessment Photographic evidences	From beginning till completion of project	HSE Manager/ Proponent
Vegetation	Cutting of trees	Avoid unnecessary cutting of trees, in case of cutting of trees, one plant should be replaced by 6 plants	No of trees cleared or cut Disposal of chopped trees Ensure replantation by 1:6	All project locations	Visual assessment Photographic evidences	From beginning till operational phase	HSE Manager/ Proponent

			ratio of same species				
Water	Wastage and misuse of water	Avoid un necessary use of water Prevent leakages	Water supply and use	All project locations	All project locations	From beginning till the end of project	HSE Manager/ Proponent
Construction debris	Formation of heaps Remaining concrete material results in hardening of ground surface	Avoid wastage of concrete material Reuse remaining construction material	Quantity & quality of construction material	All trenching areas	Visual assessment Photographic evidence	Weekly	HSE Manager/ Proponent
Social Environment	Disturbance to routine market and local business activities Conflicts between laborers and local communities	Specify time scale for construction activities Discussion with local people regarding conflicts if any	Maintenance of complaint register	All project locations	Review of complaint register Local consultations	Monthly	HSE Manager/ Proponent
Roads and networks	Traffic congestion Night time visibility of drivers is reduced	Diversion routes must be allocated to maintain traffic flow Signs and reflectors must be boarded for driver's visibility	Signs and detours are being followed	Intersections of diversions	Observations Local residents consultations and log book	Weekly	HSE Manager/ Proponent

Health and safety	Lack of awareness to general public about safety may lead to accidents Incompetent and untrained workers might cause harm	Safety symbols and instructions will be boarded at work sites Trained personnel will be appointed for the specific work	Safety precautions	On all project sites	Tool box talk Visual assessments Record of PPEs	Daily	HSE Manager/ Proponent
	to themselves and others. Construction works may include many risks and hazards that may lead to injuries or even death	Appropriate PPEs must be used for technical work	Use of PPEs				
Operational Phase							
Electric Magnetic Field (EMF)	Human health impacts such as, neuropsychological disorders or cardiovascular diseases	Increase depth of cables to suppress the EMF levels Appropriate cabling with protective shields to suppress electron flux	EMF Intensity	Residency units near the corridor and grids	Electromagnetic meter	Biannually	HSE Manager/ Proponent

Transformer oil spillage	Contamination of soil and water bodies	Regular checking of storage tanks and machines	Soil sampling for oil and grease	Grid station	Visual assessment Soil analysis Equipment maintenance record	Bi annually	HSE Manager/ Proponent

CHAPTER # 1

INTRODUCTION

1.1PURPOSE OF THE REPORT

It is mandatory to conduct a thorough Environmental Impact Assessment prior to start construction activities to identify the potential and real threats associated with construction as well as operational activities of the proposed project on the environment and socio-economic stuff of the area.

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore for the compliance of Section 12 of Punjab Environment Protection Act-1997 (Amended 2012) to obtain Environmental Approval before starting the construction activity at the project site. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectorial guidelines

The main objectives of this EIA study were:

- To determine and document the state of the environment of the project area and establish a baseline in order to assess the suitability of the proposed Project
- To identify pre construction, construction and operational activities with their consequential impacts on environment.
- To present mitigation and monitoring plan for smooth implementation of the suggested mitigation measures.
- To provide opportunity to the public for understanding the project

and its

impacts on the community and their environment through public consultation.

- Provide assistance to the proponent for planning, designing and implementing the project in a way that would eliminate or minimize the negative impact on bio-physical and socio-economic environment and maximizing the benefits to all parties in cost effective manner.
- To prepare an EIA Report for submission at the Environmental Protection Agency, Punjab for Environmental Approval.

1.2 IDENTIFICATION OF THE PROJECT AND PROPONENT

This proposed project is installation of 132 KV Grid station by Installation of 132 KV Grid Station by M/S Panther Tyres Limited situated at 29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura Pakistan".

NAME OF THE PROPONENT

Name: Mr. Mian Faisal Iftikhar S/O Mr. Mian Iftikhar Ahmed

Designation: CEO

Contact No.: 042-111554444

E-mail: info@panthertyres.com

Mailing Address: House No. 18 B, Mohallah Officers Colony, Zarrar Shaheed Road, Lahore Cantt, District Lahore.

1.3 COST OF THE PROJECT

The cost of the proposed project has been estimated at 200 million PKR approximately, Including land, infrastructure and machinery cost.

1.4 DETAILS OF CONSULTANT

For the preparation of the EIA Report of the proposed project, the proponent has hired the services of the environmental consultants; M/S Elite Environmental Solutions (Pvt.) Limited Team comprising of Environmental Engineers, Chemical Engineers and Environmental Experts has worked on this report. Elite Environmental Solutions (Pvt.) Limited is one of the pioneers Environmental Consultancy Companies in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions. Elite Environmental Solutions (Pvt.) Limited provides the environmental services, litigation and consultancy to clients both industry and government.

Elite Environmental Solutions (Pvt.) Limited is providing quality services in various environmental sectors i.e.

- Environmental Assessment Reports i.e., IEE/EIA
- Baseline Studies
- Environment Management Plans (EMP)
- Designing of Emission Control Equipment
- Waste Water Treatment Plant (WWTP) Designing
- WWTP Construction Supervision, Commissioning and Operations
- Establishing Bottled Water Plant based on RO or UF
- Lab testing (Drinking Water & Waste Water Analysis, Soil Analysis, Sludge Testing, Petroleum/ Lube Oil Testing, Fertilizer Analysis, Pesticides in Water, Soil, Fertilizer, Coal, Coke Analysis)
- Monitoring and inspection
- Environmental modelling

Contact: Elite Environmental Solutions (Pvt.) Ltd.

Address: First Floor, House No. 12, V-Lane, Street No. 6, Cavalry Ground, Lahore.

Contact: 042-36620872, 0300-6509353.

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The current study was carried out by the following professionals:

Name	Profession	Qualification	Professional Experience	Roles
Muhammad Nawaz	Principle Environmental Advisor	BE Chemical Engineering	7 Years	• CEO • EIA report Review
Muhammad Iqbal	Senior Environmentalist	M.Phil. Env. Sci.	5 Years	• Capacity building & training • Conducting and monitoring of health assessment surveys • Environment health risk assessment and management
Mr. Mubashir	Senior Environmentalist	B.S Env. Sci. and M.Phil. Sociology	6 Years	• Collection of baseline data. • Preparation of survey tools including socio-economic survey tool and environmental checklist.

Hafiz Tahir Mahmood Tahir	Environmentalist	M. Phill Environmental Sciences	6 Year	• EIA report writing • Impacts assessment and proposed their mitigation measures. • Public consultation.
Iram Shehzadi	Environmental Engineer	MS Environmental Engineering	2 Year	• Site Alternatives Analysis • Project Impact on Location & Design.
Dr. Qaiser Imran	Environmentalists	PhD. (China) Environmental Sciences	7 Year	R&D Expert

1.5 BRIEF DESCRIPTION OF NATURE, SIZE AND LOCATION OF PROJECT

The subject project has been planned on the norms of sustainable designs and patterns provided under the legislative and sectoral guidelines of Environmental Protection Agency, Punjab. Subject project for which this Environmental Impact Assessment (EIA) Study has been conducted is the proposed Installation of 132 KV Grid Station by M/S Panther Tyres Limited situated at 29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura, Pakistan".

Total cost of project is approximately Rs. 200.00 million PKR. Total area for proposed project is 09 Kanal & 1 Marla.

1.5.1 GEOGRAPHICAL LOCATION OF THE PROJECT

The proposed project is located at 29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura, Pakistan".

Google Earth Map of the project site is given in chapter two of this report. Project land coordinates are as follows:

North: Lahore-Sheikhupura Road

South: Open Land

East: Population

West: Industry

The proponent of the M/S Panther Tyres Limited, has planned the basic facilities for the project. Passable open area is planned for developing of plantation.

1.6 SCOPE OF STUDY

For the EIA study, the scope of work is as under:

- Description of physical, ecological and socio-economic conditions in and around the facility.
- Project impact identification, prediction and significance at all stages of the project including planning, implementation and operation.
- Identification and assessment of the workability of mitigation measures to offset or minimize negative project impacts on environment.
- Identification of occupational hazards during all stages of the project and laying down suggestions for improvement in the conditions.

1.7 METHODOLOGY FOR EIA

This environmental impact assessment is based on methodology provided in the EPA notified guidelines for preparation of EIA report. Initially the baseline of the project area was developed by gathering secondary data, records and information on existing physical and social, and ecological environment. The primary data for the purpose of this EIA report was generated through monitoring and laboratory testing of environmental parameters. The EIA study has adopted the following methodology for report compilation:

1.7.1 PROJECT DATA COMPILATION: A generic description of the activities relevant to environmental assessment is compiled with the help of the proponent.

1.7.2 PUBLISHED LITERATURE REVIEW: Secondary data on weather, water resources and vegetation, and other relevant environmental features of the project area and the similar projects, is reviewed and compiled.

1.7.3 LEGISLATIVE REVIEW: Information on relevant legislations, regulations, guidelines, and standards is reviewed and compiled.

1.7.4 IDENTIFICATION OF POTENTIAL IMPACTS: The information collected is reviewed and potential environmental issues are identified.

1.7.5 IDENTIFICATION OF MITIGATION MEASURES: Mitigation measures are identified for all the likely impacts in order of preference for avoiding the impacts

altogether, minimizing their frequency or extent and compensating or rectifying the losses; as may be found practicable in the project.

1.7.6 SELECTION OF ALTERNATIVES: Based on the potential impacts and the cost required to mitigate them, most crucial project employing the best available machinery at the most feasible site is selected.

1.7.7 SITE VISITS

This study is based on the finding of the field visits conducted by the team EES. Team members visited the location and adjacent area to perform survey and to gather primary baseline information with reference to environmental and social aspects.

1.7.8 PROJECT BASELINE DATA COLLECTION

A considerable amount of baseline information on the project area was available from the environmental studies previously conducted in the region of other projects. A field visit was conducted to collect primary data on the water quality, ambient air quality, noise level, and ecological species surviving in the area and the ecosystems prevalent, and the lifestyle, socio- cultural setup, income and sources of income and the facilities available for the residents in the areas around the unit. For ambient air and water quality, tests were conducted by an EPA-certified laboratory, noise level was measured using noise meter, and for socioeconomic profile, people around the site were interviewed.

1.7.8 IMPACT IDENTIFICATION AND ASSESSMENT

The environmental and socio-economic features and other project information collected, is used to assess the potential impacts of the activities. The issues studied include potential project impacts on:

- Geomorphology
- Meteorology
- Groundwater and surface water quality
- Ambient air quality& noise level
- Ecological Resources, including flora and fauna
- Local communities

Wherever possible and applicable, the discussion covers the following aspects:

- The potential change(s) in environmental parameters likely to be affected by project related activities

- The identification of potential impacts
- The evaluation of the likelihood and significance of potential impacts
- The defining of mitigation measures to reduce impacts to as low as practicable
- The prediction of any residual impacts, including all long-term and short-term, direct and indirect, and beneficial and adverse impacts
- The drafting of monitoring arrangements of residual impacts

1.7.9 MITIGATION MEASURES AND EMMP

Impact assessment has been supplemented by the incorporating mitigation measures to lessen severity of impacts and to manage different activities within the outline of environmental management and monitoring plan. The EMMP is provided to facilitate the proponent in establishing an environmental conscious system that supports conservation at all levels of its construction and operation.

1.7.10 DOCUMENTATION, REVIEW AND CONCLUSION

This EIA Report is prepared according to the relevant guidelines prescribed by the Punjab Environmental Protection Agency, Punjab. It includes findings of all the phases of the assessment process. Before preparation of the final report for submittal to the EPA Punjab, draft report was presented to the Proponent for review and comments.

Different measures for environmental conservation ensuring sustainable economic development have been taken. These measures include:

- Energy conservation plans
- Wastewater collection and environment friendly disposal plans
- Solid waste collection and environment friendly disposal plans
- Efficient space management
- Temperature maintenance
- Aesthetic values
- Health and safety aspects
- Emergency/contingency plans

1.8 SCREENING

Screening is a mandatory part of EIA Process. The EPA Punjab has provided a layout for screening. The regulations for review of IEE/EIA, 2000, the EPA Punjab has provided Schedule I and II which categorize projects into IEE and EIA. According to the

Schedules the proposed project falls under the category of EIA i.e., **Schedule II** (List of projects requiring an EIA). The project falls in the category **A. Energy (3)** which delas with "Transmission lines (11KV and above) and **Grid Stations**".

1.9 SCOPING

The process of identifying the content and extent of the Environmental Information to be submitted to the Competent Authority under the EIA procedure.

Scoping is therefore primarily focused on identifying the impacts to be assessed and which of these are most important, but it may also address some or all of the following matters: Importance of scoping in EIA:

Scoping helps to select what is needed and what is not relevant, and thus it serves as a work plan for the entire EIA process. The information gathered during the scoping phase is used in the next steps of the EIA.

• The types of alternatives which ought to be considered;

• The baseline studies which are required to characterize the existing environment;

• Any special requirements for baseline studies regarding their geographical extent or timing e.g., because of seasonal changes in fauna and flora;

• The level of detail of investigations required;

• The methods to be used to predict the magnitude of environmental effects; • the criteria against which the significance of effects should be evaluated;

• The types of mitigation to be considered;

• Any further consultations to be carried out during the environmental studies;

• The structure, content and length of the environmental information (or EIS);

• The membership and management of the EIA Team;

• The workplan and resourcing for the environmental studies. This will define the scope of the environmental information to be submitted and provide the terms of reference for the environmental studies.

1.9.1 SCOPING MEETING:

A scoping meeting was held to share this basic level of project information with all the project stakeholders before the information is incorporated into the report, so that some

improvement can be sought out in the data as may be necessary, better or more friendly alternatives can be selected, and better and more practicable mitigation measures can be suggested.

1.7 COMPONENTS OF THE REPORT

This EIA Report presents the screening of potential environmental impacts of the induction furnace and discusses the necessary mitigation measures to eliminate or reduce the negative impacts to an acceptable level. It also describes the institutional requirements for smooth and easy implementation of the project and provides an Environmental Management Plan (EMP).

EIA report comprises of following chapters.

Chapter 1: Introduction (A description of the project including the need for the project and how the project will be undertaken).

Chapter 2: Project Description (Full description of the relevant parts of the project and summary of project inputs and outputs).

Chapter 3: Policy, statutory, and institutional Framework (A description of the pertinent national & provincial legislations, regulations and policies that are relevant and applicable to the project and a demonstration of how the project conforms to these aspects).

Chapter 4: Description of the Environment (Description of project area's existing physical, biological and socio-economic condition, including geomorphology and soils, water resources, air quality, flora, fauna and demography).

Chapter 5: Stakeholder Consultation (Presents details about stakeholder consultation regarding the project)

Chapter 6: Environmental Impacts and Mitigations Measures (Presents an assessment of the project's impacts and their required mitigation measures on the Physical, Biological and Socioeconomic environment).

Chapter 7: Environmental Management and Monitoring Plan (Provides the complete outline of the project and Environmental Management Plan).

Chapter 8: Conclusion & Recommendations (Conclusion of the EIA report with a few recommendations to conduct the project in environment-friendly manner)

CHAPTER # 2

DESCRIPTION OF THE PROJECT

Electric power transmission is the bulk transfer of electrical energy between the point of generation and multiple substations near a populated area or load center. Electric power transmission allows distant energy sources to be connected to consumers in population centers. Transmission may be via overhead or underground lines, however, most transmission is done with overhead lines because they are less costly to construct and easier to maintain. Underground lines are generally restricted to urban areas.

Substation is an assembly of apparatus, which transform the characteristics of electrical energy from one form to another, say from one voltage level to another level, hence a substation is an Intermediate link between the Generating station and consumers.

The most important part of electric power system is the Grid Station. A 132kv Grid Station is that part of power system where high voltage of 132kv is received, stepped down to 11kv and then given to different feeders that feed distribution lines. This whole process is carried out by different parts and equipment.

2.1 TYPE AND CATEGORY OF THE PROJECT:

This Environmental Impact Assessment (EIA) Study has been conducted is the proposed Installation of 132 KV Grid Station by M/S Panther Tyres Limited situated at29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura, Pakistan".The capacity of grid station will be 132 KV.

This report is required to fulfill the legal requirements set under section 12 of the PUNJAB Environmental Protection Act, 1997 (Amended, 2012). According to the act and as per regulations Review of IEE & EIA Regulations, 2000 the proposed project falls under the category of EIA i.e., **Schedule II** (List of projects requiring an EIA). The project falls in the category **A. Energy (3)** which delas with "Transmission lines (11KV and above) and **Grid Stations**". This chapter renders a detail account of the project and

its features, such as location, process and activities involved during various phases of the project life cycle.

2.2 OBJECTIVES OF THE PROJECT

Objectives of the construction of the subject project are:

- Assess the existing environmental conditions in the project area, including the identification of environmentally sensitive areas and receptors;
- Assess the various activities (such as construction, process, operational etc.) to identify their potential impacts on environment, evaluate these impacts, and determine their significance;
- Propose appropriate mitigation measures that can be incorporated into the design of the proposed activities to minimize damaging effects or lasting negative consequences identified by the environmental assessment;
- Assess the proposed activities and determine whether they comply with the relevant environmental regulations in Pakistan;
- Prepare an EIA report to be submitted to the Environmental Protection Agency (EPA), Punjab.

2.3 ALTERNATIVE CONSIDERATIONS AND REASONS FOR THEIR REJECTION*:*

The nature and location of the proposed project would require interrogation through activity and location alternatives. Incremental alternatives would be relevant for both public as well as private projects. Alternatives can be distinguished into discrete or incremental alternatives. Discrete alternatives, are options which are generally identified during the pre-feasibility, feasibility and or scoping phases of the EIA.

The following types or categories of alternatives can be identified: 1. Activity alternatives 2. Location alternatives 3. Process alternatives 4. Demand alternatives 5. Scheduling alternatives 6. Input alternatives 7. Routing alternatives 8. Site layout alternatives 9. Scale alternatives 10. Design alternatives.

Alternatives considered for the project:

2.3.1 LOCATION ALTERNATIVES:

To fulfill the power supply aspects of the project under reference of this EIA Report, it is to be sited at a place where residential area is present and shortage of power supply is either

already going on or there are bright prospects of the same. Concomitantly, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997 (Amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, basic infrastructure, sewerage etc. is yet the other necessary requirements.

Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with increasing the opportunity of employment, and other related facilities.

Keeping these requirements and their feasibility and other basic infrastructural requirements, the selected site is ideally suited for construction of the subject grid station of 132KV.

2.3.2 ALTERNATIVE SITE: NEAR FEROZ WATTOAN

Before the consideration of subject project site, project proponent had considered another site at/ near the Sheikhupura City but later it was rejected due to unavailability and high cost of land and dense human settlements near the project site.

2.4 LOCATION AND SITE LAYOUT OF THE PROJECT:

Subject proposed project is located at 29.5-Km, Lahore-Sheikhupura Road, Sheikhupura, Distrcit Sheikhupura, Pakistan". The capacity of grid station will be 132 KV.

Project land coordinates are as follows:

North: Lahore-Sheikhupura ROad

South: Open Land

East: Population

West: Industry


Gujar Chowk
Rohi Nala Rd
Rohi Nala Rd
Rohi Nala Rd
Hudiara Drain
Rohi Nala Rd
Rohi Nala Rd
Rohi Nala Rd
Rohi Nala Rd
Rohi Nala Rd
Rohi Nala Rd
Valley Foods
FRONT ROAD
ATS PROPOSED AREA
ATS PROPOSED AREA
Perfect Electro Mek Pakistan (Pvt.)
Ali Fancy Embroidery
Kahna Kacha Road
ATS Synthetic (Pvt.)

Figure 1: Aerial view of the proposed project site

2.5 LAND USE ON THE SITE

The proposed site is currently an open land with some trees. The land is owned by the proponent and land ownership documents are attached with this report.

2.6 ROAD ACCESS

The proposed project site can be accessed through Lahore-Sheikhupura Road.



2.6.1 TRAFFIC MANAGEMENT PLAN

Construction Phase	Operation Phase
• Timing of the vehicles carrying construction material of infrastructure should be set as to cause minimum disturbance to traffic on existing road. • The construction equipment and machinery must be stationed in the boundary premises to avoid the traffic congestion on the main Road. • Transportation of raw material and heavy machinery will be done early in the morning • Coordinated planning of traffic movement by the Traffic Police and the Transport Department in accordance with the construction program with advance	• Enough space for vehicle parking will be provided to avoid random vehicle parking on roads. • The transportation vehicles must be stationed in the boundary premises to avoid the traffic congestion on the main Road.

warnings to the affected residents and road users. • All the machinery will stay inside the periphery of project site so it will not cause disturbance in the traffic.	

2.7 VEGETATION FEATURE OF THE SITE

The proposed site is an open land with little number of trees. No major tree cutting will be



involved in the project.

2.8 COST AND MAGNITUDE OF OPERATION

The total area for proposed project is 9 Kanal & 1 Marla. Cost of the project is estimated to be 200 million PKR. this report will propose mitigation and monitoring measures for the project in order to ensure that the magnitude and frequency of impacts are minimized/eliminated.

2.9 SCHEDULE OF IMPLEMENTATION

The project is estimated to take one year from ground breaking until completion of construction activities. Construction activities will start once Environmental Approval is obtained from the EPA, Punjab.

2.10 PROCESS DESCRIPTION

2.10.1 GRID STATION

The most important part of electric power system is the Grid Station. A 132kv Grid Station is that part of power system where high voltage of 132kv is received, stepped

down to 11kv and then given to different feeders that feed distribution lines. This whole process is carried out by different parts and equipment.

A Grid station (substation) is part of an electrical generation, transmission, and distribution system. Grid stations transform voltage from high to low, or the reverse, or perform as a buffer to provide continuous power to the consumers even if there is a shortfall of power from the source. Electric power may flow through several grid stations between generating plant and consumer, and its voltage may change in several steps. A substation may include transformers to change voltage levels between high transmission voltages and lower distribution voltages, or at the interconnection of two different



transmission voltages.

The main parts of the grid station are the *switch yard*, *11kv control room*, *132kv control room*, *battery room.* All of them are discussed below one by one along with their respective switching, protection and control equipment.

2.10.2 SWITCH YARD

Switch yard is divided into three parts i.e., *line bay*, *bus bar* and *transformer bay.*

1) **LINE BAY:**

Line bay consists of

a) **WAVE TRAP**:

It traps the waves associated with 132kv line, which are used for communication process.

b) **ISOLATOR:**

An isolator will be installed which isolates the grid from the line. Isolators are "*no load"* switches and are operated under no-load conditions. Its operating under load condition is very dangerous as disconnecting high voltages will create a large flash.

c) EARTH SWITCH:

An earth switch is also installed with the isolator, with the help of which we ground any static charges before working/maintenance.

d) LINE CIRCUIT BREAKER:

A high rating line circuit breaker is installed which operates automatically under abnormal conditions and disconnect the grid from the line to avoid any damages. It can also be operated manually and unlike isolators, they can be operated under load conditions as they have quenching media in them.

e) LINE CURRENT TRANSFORMER:

After circuit breaker a current transformer is installed which calculates current and give indication to the C/B when over current fault occurs hence acts as a protective device as well as measuring device. Its CT ratio is generally 600/5A.

f) ISOLATOR:

Again, an isolator will be installed.

2) BUS BAR:

After line bay it comes 132kv bus bar. It acts as a node point between line bay and transformer bay. Bus bar helps in getting connections to several units (transformers) from a single 132kv line. It can be used for incoming connections as well as outgoing ones.



A) POTENTIAL TRANSFORMER:

A potential transformer is also connected in parallel to 132kv bus bar through an isolator, which measures voltage as well as give indication to over voltage relay under over voltage conditions.

3) TRANSFORMER BAY:

Transformer bay consists of

A) TRANSFORMER ISOLATOR:

After bus bar another isolator is used which isolates transformer from the line. Operating it in ON load condition is very dangerous as high voltages produce arc while connecting/disconnecting and they don't have any quenching media.

B) CURRENT TRANSFORMER:

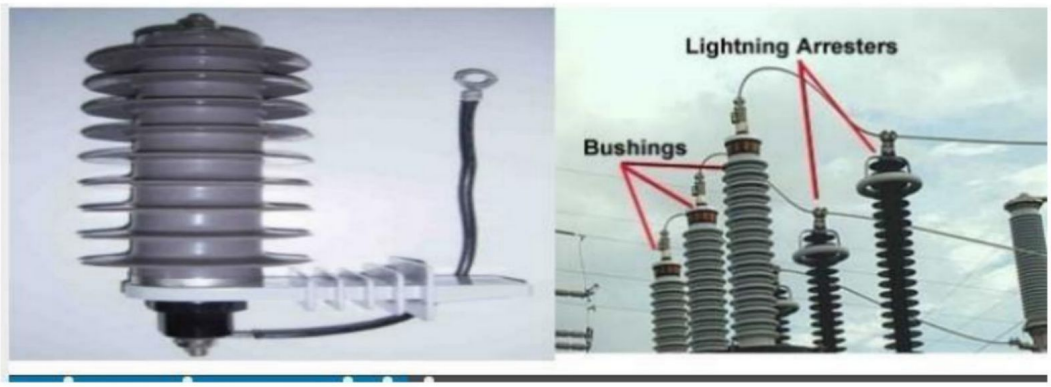
Again, a current transformer is installed which calculates current and give indication to the transformer C/B when over current fault occurs hence acts as a protective device as well as measuring device. Its CT ratio is generally 200/5A.

C) TRANSFORMER CIRCUIT BREAKER:

Again, a circuit breaker is installed which operates automatically under abnormal conditions and disconnect transformer from the bus bar to avoid any damages. It can also be operated manually and unlike isolators they can be operated under load conditions as they have quenching media in them.

D) LIGHTNING ARRESTER (132KV):

Lightning arresters are devices which arrests and ground any thunder storms falling on the power transformer and secure it from any harm. They are installed on each phase at a relatively more height. They are grounded and have a non-linear resistor which act as insulator for132kv voltage and as a conductor for higher voltages like that of thunder storms and lightning bolts. In this way they ground these high voltages and provide safety to the transformer and whole system.



E) POWER TRANSFORMER:

Then the power transformer is installed which steps down 132kv to 11kv.

F) LIGHTNING ARRESTERS (11KV):

Again, on the LT side of power transformer small lightning arresters are used. And the purpose is again the safety of transformer from thunder lightning.

G) CABLES (11KV):

These cables give the transformer output to the 11kv incoming panel of the respective transformer.

2.10.3 POWER TRANSFORMER:

These are the step-down transformers with Delta circuit configuration on input side (HT) and Star circuit configuration on output side (LT). This transformer steps down 132Kv to 11Kv. An input of 132kv is given to the transformer primary coil through three input wires i.e., Red(R), Yellow(Y) and Blue (B) and then 11kv is taken from secondary coil. The transformers use the magnetic induction process to step down the 132Kv to 11Kv due to specific turn ratio in coils.



The main parts of a power transformer are its windings and bushes. Some other parts, also known as accessories are:

A) CONSERVATOR OIL:

Conservator oil also called mineral oil. It helps in insulation of windings as well as in cooling.

B) CONSERVATOR TANK:

it is fixed at an upper position and is filled about 70% to 80% of mineral oil.

C) RADIATOR TUBES:

the circulation of transformer mineral oil takes place through these tubes, as heated oil goes up and cooled oil goes down, hence continue the oil circulation for better cooling.

D) COOLING FANS:

these fans also help in transformer cooling. They are fitted below or at the side of radiator tubes and provide cool air.

E) BUCCHLOZ RELAY:

this relay is fitted near conservator tank and is also called float relay and gas detecting relay. This relay detects the gases that are produced in the transformer under abnormal conditions and operates to trip the transformer, hence avoid further damages.

F) DIAPHRAGM:

Diaphragm is a cap shaped object and fixed on the top of power transformer, it acts as emergency exit for transformer inner oil and gases.

G) WHEELS:

Transformer has small wheels upon which it can be rolled from one place to another. As they hold the transformer at a height from the ground or foundation so air flow is possible beneath transformer.

H) OIL TEMPERATURE INDICATOR:

This indicator detects the temperature of transformer oil. If the transformer oil gets heated to such a temperature that can harm transformer, the oil temperature indicator operates. It has two settings; one is alarm and the other is tripping.

I) WINDING TEMPERATURE INDICATOR:

This indicator supervises winding temperature. Like oil temperature indicator it also has two settings, one is alarm and the other is tripping the transformer.

J) TAP CHANGER:

This is an instrument connected with the power transformer that is used to vary the transformer output. It actually changes the number of turns in the secondary coil of transformer.

K) DEHYDRATING BREATHER:

It is a tube on the side of transformer connected to conservator tank. It extracts un-moisture air from the outside to fill the vacuum in the tank. To extract water particles from the air, silica gel is used which is filled in the breather tube. Note that vacuum is created when some gases are expelled through the same tube.

L) TRANSFORMER COOLING

When the transformers operate continuously, as a result the core, coils, main tank and the transformer oil heats up to a high temperature which can affect the operation,

maintenance, and output voltage of the transformer. In grid stations transformers are kept cool through three different processes. That are:

1. ONAN: It stands for ***oil natural air natural***. In this method fans are OFF and the transformer is cooled by natural air, same is the case of oil which circulates by spontaneous motion of hot and cold oil.
2. ONAF: It stands for ***oil natural air forced.*** This method is applied under a bit higher temperature. Oil circulation takes place by itself while the air is provided by radiator fans.
3. OFAF: It stands for ***oil forced air forced***. This method is applied under highest temperatures. Fans are ON that provide more air and the circulation of oil is also speedup by oil circulation pump.

2.10.4 11Kv Room

The outputs of each power transformer are than brought into 11Kv Room through power cables. The 11Kv room has incoming panels for each transformer, different outgoing panels for each incoming panel and a bus coupler. All of them are explained below.

A) 11kv Incoming Panels:

These panels are fitted in the 11Kv room, receiving 11Kv from each transformer as each transformer has its own incoming panel. The incoming has a number of parts like 11Kv C/B, bus bar, relays and power meter etc. that are included in each of the incoming panel.

B) 11kv Outgoing panels:

The output of incoming panel is given to several outgoing panels through a rigid bus bar. They also have different parts like current transformer, vacuum circuit breaker, relays and different meters and indicators.

C) BUS BAR COUPLER:

As the name "bus bar coupler" indicates that it couples the bus bars of two incomings. It also known as bus coupler. It couples one 11kv bus bar to another when one of the transformers is faulty so that the supply towards the consumers is not disturbed. The advantage is the uniform (un-interrupted) supply. It is installed between the two incoming panels in the 11kv control room.

It is possible that a transformer gets damaged and is out of work, so to transfer the load of one transformer to other in grid station the bus coupler connects the incoming of damaged transformer to the incoming of the other working transformer.

2.10.5 132KV CONTROL ROOM

As the name control room indicates that it is the room from where the whole grid is controlled. Each and every circuit breaker, current transformer, potential transformer,

power transformer and its accessories, yard lightning and other equipment are controlled from the control room of the grid station. This room also has a number of panels like control panels, relay panel, transformer auxiliary panel, AC DC panel and rectifier/battery charger. Each of them is discussed below.

A) 132KV LINE PROTECTION PANEL:

This panel is especially for 132kv line. It consists of *distance relay*, *over current and earth fault relay* and *DC supervision relay*.

B) DISTANCE RELAY:

This relay shows the zone where the fault occurs as well as the phase in which occur i.e. A, B & C.

C) OVER CURRENT AND EARTH FAULT RELAY:

This relay does trip as well as shows whether the fault (over current) was due to phase-to-phase short circuit or phase to ground one.

D) DC SUPERVISION RELAY:

DC supervision relay shows whether the system (panel and relays) is healthy or not.

E) 132kv Line Control Panel:

This control panel controls the line bay i.e., the system from the tower to the bus bar.

2.10.6 TRANSFORMER CONTROL PANEL:

This panel controls the system inside bus bar. Transformer CT, PT, circuit breaker etc. comes under the umbrella of this panel. It gives indications of different faults and problems.

2.10.7 TRANSFORMER AUXILIARY CONTROL PANEL:

This panel controls various operations related to the working and protection of the power transformer. In 132kv control room it is installed one for each power transformer. It has

two meters: one shows the tap position and the other shows temperature of transformer in.

Two selector type switches: one for cooling fans ON OFF and other for tap changer.

It also gives different indications like

- Cooling fans automatic ON OFF
- Cooling fans manual ON OFF
- Fans supply fault
- Winding temperature alarm
- Fan motor circuit breaker trip

- It also has an emergency stop press button which is used in emergency.
- Also, an automatic voltage regulator is installed in the transformer auxiliary control panel.

2.10.8 AC DC PANEL:

This is another important panel in the 132kv control room. It controls AC and DC supply of the whole grid. It has two parts one for AC and other for DC.

AC PANEL:

- AC panel consists of three meters for R, Y & B phases, a voltmeter and a KWH meter. It controls AC supply of
- Switch yard lights
- Tap changer
- 132kv breaker motor
- Battery charger
- Transformer cooling fans
- Control panels.
- It also controls AC supply (220 v) of the 11kv incoming and outgoing panels.

DC PANEL:

- It also has a DC ammeter and a DC voltmeter to show current and voltage. It controls DC supply of
- control room building lights (DC)
- switch yard DC lights
- 11kv & 132kv breaker motors
- 11kv switch-gear protection
- DC emergency bus
- Control and relay panels.
- It also has battery alarm and under/over voltage relay.

2.10.9 RECTIFIER:

A rectifier is an instrument/circuit that changes AC into DC. In the grid station it is used for several purposes i.e.

- It charges batteries
- Provide DC supply to the load
- Shares load with battery during overload condition.

The rectifier used in grid has a voltmeter and an ammeter for incoming AC and another voltmeter and ammeter for outgoing DC.

It also has control switches like

- ON/OFF
- Auto/manual
- Boost/float (for boost and normal charging of battery)
- Load/battery.

2.10.10 Relay panel:

This panel controls different relays like overcurrent relay, distance relay, differential relay, oil temperature and winding temperature relay and many more that are discussed as under.

a) OVER CURRENT RELAY:

As the name indicates these relays keeps the transformer safe from over current which may cause serious problem to the transformer. As we know that some time the consuming of electric power increase to a dangerous level that causes a huge current due to over loading. The relay trips and gives indication of the type and area of tripping.

b) DIFFERENTIAL RELAY:

These relays operate on the fault between transformer input and output. The fault may be due to low voltage, high voltage or may be due to earth fault.

c) OIL TEMPERATURE RELAY:

These relays as the name indicates supervise the oil temperature. As we have discussed earlier that as the transformer operates continuously, the temperature of oil increases, this temperature may sometime increase to a dangerous situation as a result this relay operates.

d) WINDING TEMPERATURE RELAY:

These relays as the name indicates supervise the winding temperature. As we have discussed earlier that as the transformer operates continuously, the transformer winding heats up. This temperature may sometime increase to a dangerous situation which cause this relay to operates.

e) T/F BUCHHOLZ RELAY:

This relay operates as the buckle action occurs. Buckle reaction is discussed before. As we know that buckle action occurs when dangerous gasses produce in main tank so this situation is also an alarming situation and it must also be noticed as well so this job is done through this relay.

2.10.11 BATTERY ROOM

Battery bank is the conserved source of 110v dc voltage.

It gives supply to the protection system of the grid when supply from the rectifier stops.

In the grid station's battery room/bank, there are generally 55 cells of 2v dc each. These cells are connected in series to get 110v. The batteries are charged by the rectifier.

These are lead acid batteries having specific gravity of 1.220 and are of 150 A.H capacity.

A battery has the following components:

a) CONTAINER/JAR:

It is generally made of plastic and gives support to the electrolyte and plates.

b) ELECTROLYTE:

A solution of 35% sulphuric acid (H_2SO_4) and 65% water (H_2O) is filled in the container.

c) PLATES:

Two dis-similar plates are dipped in the electrolyte, one made of "lead oxide" act as cathode and other made of "lead" act as anode.

d) CONNECTION LEADS:

The electrodes are connected with the connection leads.

e) VENT CAP:

Every battery has a vent cap that is used to evolve any gas bubbles produced during conduction in electrolyte.

2.11 WATER REQUIREMENTS:

During the constructional phase of the project underground water will be used as water source of the project. Total water requirement during construction phase is about 3-4 m^3 /day.

2.12 WASTE WATER TREATMENT:

60-70% of the used water will be the waste water which will be treated in the septic tanks.

2.13 SOLID WASTE:

Approx. 600-800 kg/day constructional and domestic waste will be produced during the constructional phase of the project. Constructional waste will be reused for road filling and maintenance purposes.

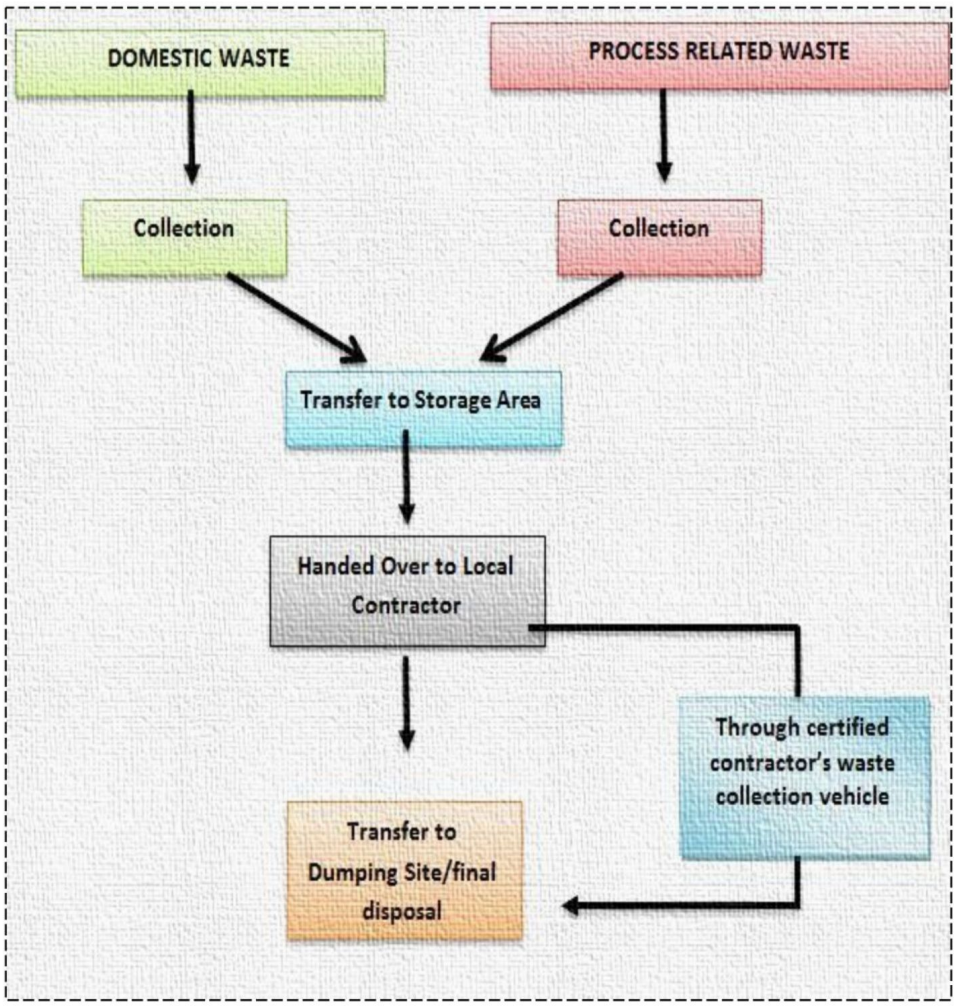
According to an estimate, approx. 9-10 kg/day domestic (based on solid waste generation rates of 0.45 kg/capita/day urban waste generation) which will be handed over to the certified contractors. Project related waste will not be generated as the subject project is Grid station.

2.13.1 SOLID WASTE MANAGEMENT SYSTEM/PRACTICES

The Solid waste will be managed in proper way by following operations:

1. Placement of separate waste bins for domestic and project related waste in all designated points.
2. Collection of waste from all the offices at one designated point by the sanitary workers on daily basis.
3. Careful collection of sludge on regular basis and temporary storage at designated point.
4. Collection of waste from designated area and handling to the solid waste contractors for its final disposal.
5. Waste collected will be transported at the disposal sites. After transportation of waste to the disposal site, it should be again segregated and each type of waste should be treated accordingly.

Flow chart of solid waste management plan:



2.14 MITIGATION MEASURES TO CONTROL THE EMISSIONS OF GENERATORS:

i) Firstly, the generator made up of latest and environment friendly technology will be used.

ii) Standard fuel will be used in the generator. iii) Proper and regular tuning of the generator will be done.

iv) Double glazed glass and thick walls canopy of the generators will be installed which will limit the emissions of the noise.

All these measures will ensure the PEQS compliance of generators and emissions will not exceed the limits.

2.15. TRANSMISSION LINE BUFFER ZONE:

Transmission line buffer corridors (sometimes known as 'buffer zones' or 'transmission yards') are the area around transmission lines in which activities and land uses that are incompatible. Only incompatible activities - eg: (in rural areas) milking sheds, residential dwellings and some major earthworks - primarily around the foundations of the transmission towers would be restricted.

2.151 PLANTATION

Area for plantation will be reserved within the premises of the project and planation will be done within, outside and at the boundary wall of the unit. Passable open area is planned for developing of plantation which is worked as buffer zone.

2.16 PARKING AREA

Parking area will be made available within the unit for cars, motorcycles, trucks etc.

2.17 OCCUPATIONAL HEALTH AND SAFETY:

All the methods and procedures for machinery and chemical handling and storage will be displayed and implemented at the project site.

2.17.1 PERSONAL PROTECTIVE EQUIPMENT:

Following PPEs will be available for the workers in the installation of proposed unit:

- Dust Mask
- Ear Plugs
- Ear muffs
- Safety Boots
- Safety Gloves

- Safety Belt
- Helmet
- Goggles

2.18 SECURITY

The present site will be secured by means of boundary walls along with the presence of security guards round the clock which will improve the security of the project site and also in its vicinity.

2.19 RESTORATION / REHABILITATION PLAN

All possible precautions will be taken to prevent an untoward incident in terms of life and property losses. The demolition materials will possibly be reused and recycled. All excavated surfaces will be termite proofed.

On completion of the project, the debris will be removed from the site in order to maintain aesthetics of the project. All measures will be undertaken for ensuring occupational safety, security and clean environment in the project area. Ornamental trees and flower plants will be planted on inside peripheral of the unit premises to restore the land.

2.20 GOVERNMENT APPROVALS

Proponent has applied for Environmental Approval and after getting Environmental Approval, they will apply for other required approvals.

CHAPTER # 3

STATUTORY REQUIREMENTS &

STANDARDS

3.1 EXISTING LEGISLATION AND LEGAL FRAMEWORK

The Federal Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan but after 18th Amendment in the Constitution, the Provincial Governments have taken over the subject of Environment. This IEE study has been carried out in the light of the policy guidelines of the Preparation of IEE/EIA Reports under the procedures and practices formulated by the Pak EPA and adopted by the Punjab Environmental Protection Agency (EPA).

3.2 ENVIRONMENTAL PROTECTION COUNCILS

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It has been developed under the provision of Punjab Environmental Protection (Amendment) Act 2012. It is headed by Chief Minister of Punjab with other members.

3.3 RELEVANT LEGAL / INSTITUTIONAL FRAMEWORK

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) that was replaced by the PEPA, 1997, through an Act of Parliament. According to the 18th Amendment in Constitution, the PEPA 1997 has been confined to Federal Area and provinces have been allowed to formulate their own environmental legislation in the subject of environment.

Provincial Environment Protection Departments are also working on the formulation and enforcement of environmental statutes and by-laws. The Pak EPA has issued several policies guidelines and adopted measures for streamlining the environmental assessment. Though, the need for environmental screening and assessment has received some weight during the recent past, strict implementation of the PEQS is still a dream to be realized.

The applicable laws for the environmental study of the Project are briefly described below:

3.4 PAKISTAN ENVIRONMENTAL PROTECTION ORDER (PEPO) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) 1983. It was the first legislation promulgated for the protection of environment. According to PEPO, 1983 it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

3.5 PUNJAB ENVIRONMENTAL PROTECTION (AMMENDMENT) ACT, 2012

Under section 12 (4) of PEPA, (Amended) 2012 "The Provincial Agency shall communicate its approval or otherwise within a period of four months from the date the initial environmental examination or environmental impact assessment is filed complete in all respects in accordance with the prescribed procedure, failing which the Initial Environmental Examination or, as the case may be, the Environmental Impact Assessment shall be deemed to have been approved, to the extent to which it does not contravene the provisions of this Act and the rules and regulations".

As per definition given in the Punjab Environmental Protection (Amendment) Act 2012, Environmental Impact Assessment (EIA) means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory, and compensatory measures, formulation of environmental management& training plans & monitoring arrangements, and framing of recommendations and such other components as may be prescribed. The provision of Section 12 has been incorporated "as it is" in the new Punjab Environmental Protection (Amendment) Act, 2012.

3.6 NATIONAL ENVIRONMENTAL POLICY, 2005

The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification etc.) confronting Pakistan.

3.7 REVIEW OF IEE / IEE REGULATIONS, 2000

The Pak EPA has issued Review of the Initial Environmental Examination and Environmental Impact Assessment Regulations 2000, to review the Initial Environmental Examination (IEE) / Environment Impact Assessment (EIA) reports. Categorization of the projects for IEE and EIA is one of the main components of the Regulations. As these regulations, the Projects have been classified based on expected degree of adverse environmental impacts. Project's type listed in Schedule I are designated as potentially less adverse effect, schedule I projects require an IEE and projects given in schedule II require EIA to be conducted.

3.8 GUIDELINES FOR THE PREPARATION OF IEE/EIA REPORTS

The Pak EPA has also framed Guidelines for the Preparation of IEE / EIA of projects in various developmental sectors. These Guidelines are ideal for preparing the IEE or EIA report but line-to-line preparation not necessary because Guidelines are not part of PEPA and EPA Punjab has not any notification for adoption or follow these Guidelines.

However, this IEE report has been prepared in following the Guidelines.

3.9 PAKISTAN PENAL CODE, 1860

Noise pollution has been covered in section 268, which defines and recognizes noise as a public nuisance. "A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger of annoyance to the public or the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right".

3.10 THE LAND ACQUISITION ACT, 1894

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions.

3.11 LABOR LAWS

Construction and operational activities during the course of construction may affect

occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and to ensure that contractors to follow the relevant labor laws and rules relating to safety of the workforce and creating a healthy working environment.

CHAPTER # 4

DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

An environmental baseline study is intended to establish a database against which potential project impacts can be predicted and managed later. The EIA of the proposed project covers a comprehensive description of the project area, including the resources which are expected to be affected by the project, as well as, those which are not expected to be directly affected by the construction and operation of the project. This section describes the existing environmental conditions around the project area. The existing environmental conditions around the proposed project site has been studied with respect to Physical, Biological/Ecological and Socio-Economic resources. Site visits were conducted to survey the filed area and to collect environmental data on physical, biological and socio-economic parameters. Consultations were held with the general public and stakeholders of the project area in order to seek the public opinion on the implementation of the proposed project.

4.2 STUDY PARAMETERS

The existing information to establish a database for the EIA of the project was collected from different government departments; review of previous studies and through the site visits carried out in the project area. The Social Assessment of the project area was conducted through consultation with the community by interviewing them. Assessment of the area has been carried out distinguishing it into:

4.2.1 STUDY AREA

An area about half a kilometer radius around the project has been considered as influence zone and hence it has been taken as Study Area (SA) to collect the primary data related to physical, ecological and socio-economic environment.

4.2.2 PROJECT AREA

The boundary of that specific area where the project has been established is taken as Project Area.

4.3 PHYSICAL ENVIRONMENT

This part examines the physical resources such as Geography, Geology and Soils, Topography, Land use, Climate, Surface and Ground water resources and quality and Ambient Air quality of not only the project site but also the surrounding area to assess whether the project under assessment can have any adverse impact on any of these parameters. Following is a brief description of various physical resources of the Study Area, of which the Project Area makes an integral part.

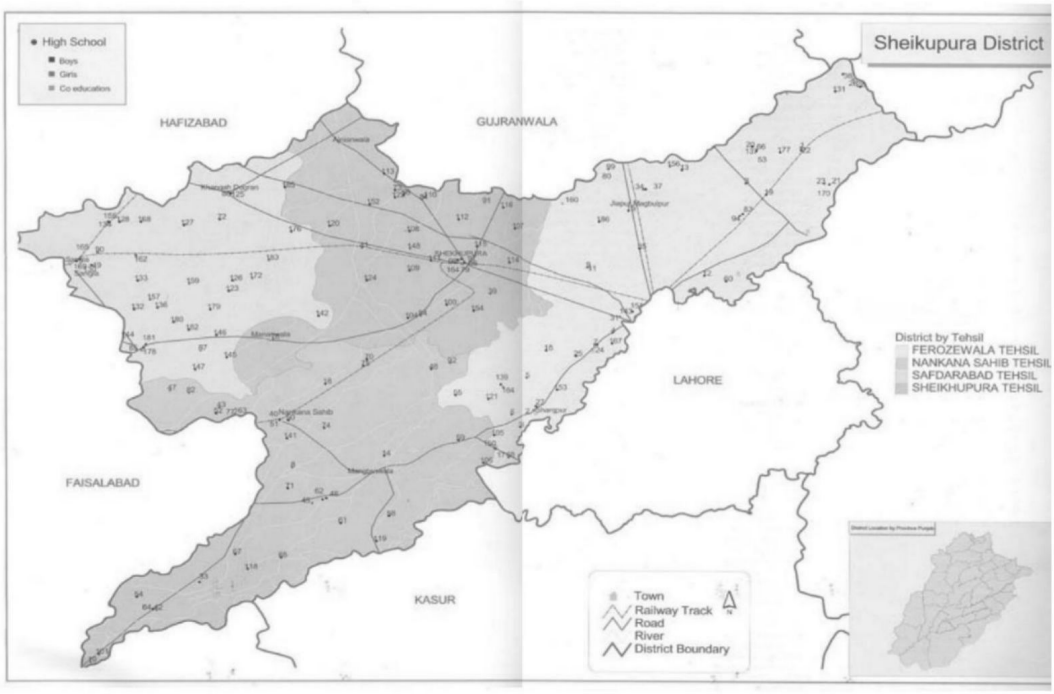
4.3.1 TOPOGRAPHY AND GEOGRAPHY

The topography of the project area is flat. The general height of the area is approximately 676 ft above the Mean Sea Level (MSL).

4.3.2 GEOLOGICAL FORMATION AND SOIL

The soil is clay loam in texture having pH 8, ECe around 3.5 d Sm-1 and field capacity range from 45-71%. It possesses sufficient organic matter from 8.3 to 9.5 mg/g dry soil. Bedrock is not exposed within the project sites and its vicinity not encountered within the investigated depth of boreholes.

Figure 4.1: Geological Map of District Sheikhupura



SEISMICITY

According to seismic zoning of Pakistan, the Project area lies in Zone 2A of Modified Mericalli (M.M) scale and represents minor damage. Distant earthquakes may cause damage to structure with fundamental period greater than 1.0 seconds,

corresponds to intensity V and VI of the M.M scale" (National Disaster Management Authority).

4.3.4 LAND USE

In terms of use of land, the project site is surrounded by foremost trade and production units. District is composed of cultivated lands with human settlements and covered with vast network of canals. However, the land of district is used for both agricultural and industrial purposes.

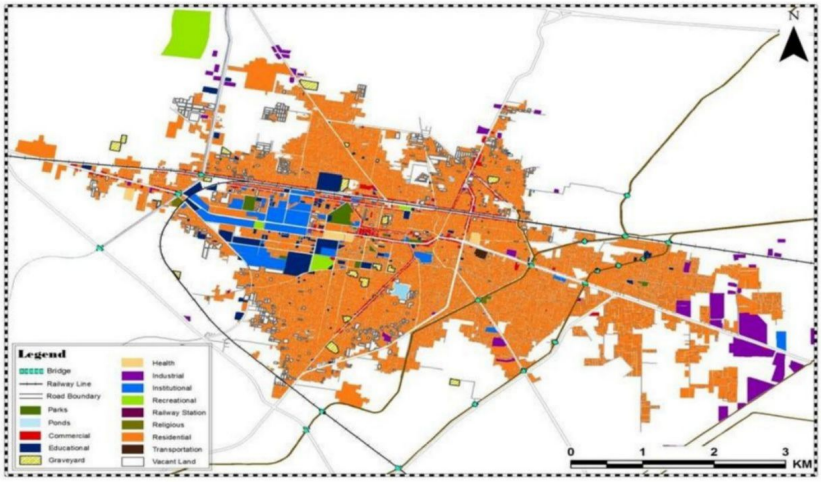


Figure 4.2: Land use of District Sheikhupura

4.3.5 CLIMATE

The climate of the district is subject to extreme variations. From the middle of December to the middle of March, the air is very damp, cold and light to moderate rain falls at intervals. The winter rain is followed by a spell of pleasant weather. In April, the temperature rises fast and the two successive months are very hot. Towards the end of June, Monsoon appears. The average rainfall in the district is about 635 mm. The details of climatic parameters are further discussed below:

Temperature and Precipitation



The average annual temperature and precipitation data is shown below in Figure 4.1:

Figure 4.3: Average Annual Temperature and Precipitation of District Sheikhupura

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years.[1]

Wind Speed

Wind speed of Study Area varies throughout the year. The following figure shows the Maximum, Minimum and Average wind speed for each month.[2]

[1] Cited on December 21, 2019; Available on: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/shekhupura_pakistan_1165221

[2] Cited on December 21, 2019; Available on: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/shekhupura_pakistan_1165221

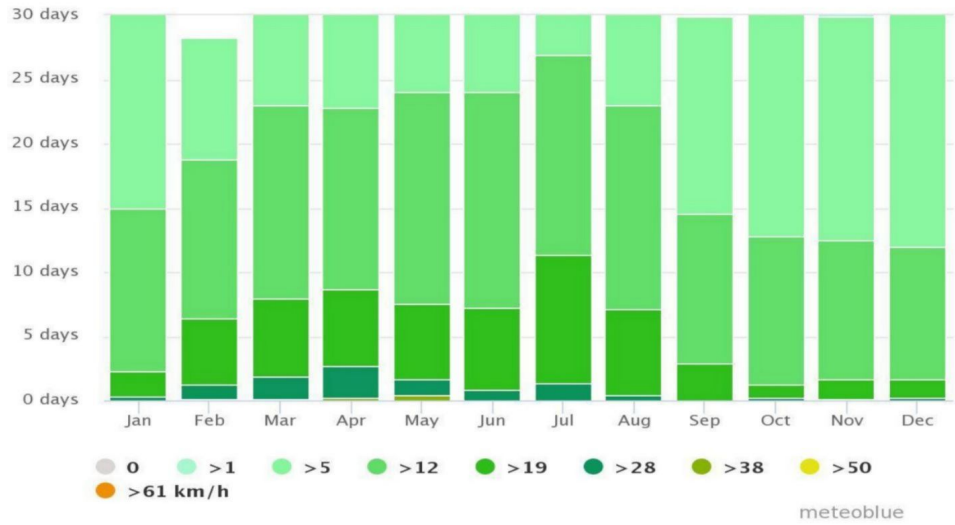


Figure 4.4: Average Wind Speed of District Sheikhupura

Wind Direction

Wind direction of any area shows that from which direction the wind is blowing. Wind direction varies throughout the year in Study Area. Dominant wind direction for each month is given below in Figure 4.3[3]:

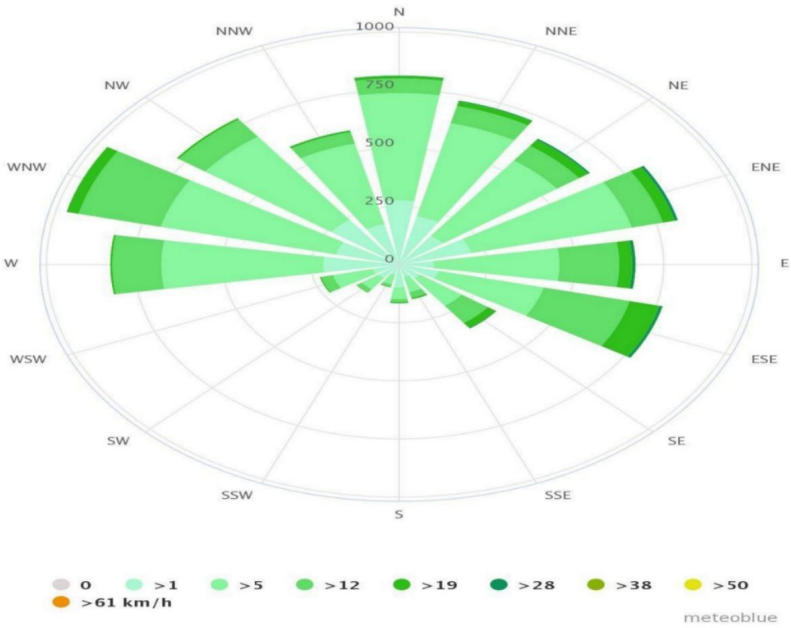


Figure 4.3: Wind Direction of District Sheikhupura

[3]Cited on December 21, 2019; Available on: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/shekhupura_pakistan_1165221

a. Sun Shine Patterns

The sunshine patterns for a specific area vary accordingly. For each month, the number of sunny and cloudy days is shown below in Figure 4.4[4]:

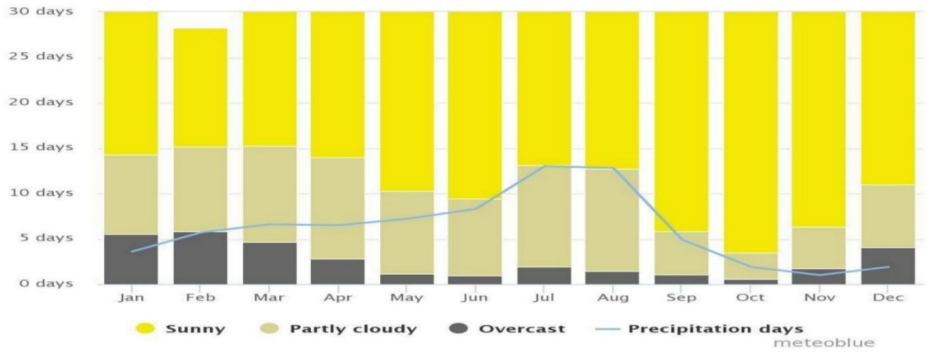


Figure 4.4: Average number of Sunny and Cloudy Days

The graph shows the monthly number of sunny, partly cloudy and overcast days. Days with less than 20% cloud cover are considered as sunny, with 20-80% cloud cover as partly cloudy and with more than 80% as overcast.

4.3.6 AMBIENT AIR QUALITY

The monitoring of air has been conducted to analyze the ambient air quality of the project area. Equipment used for monitoring was Haz Scanner HIM 6000 Air Quality Monitoring Station. The results of monitoring shows that the major air pollutants i.e., carbon monoxide, sulphur dioxide, nitrogen dioxide and particulate matter are within PEQS.

4.3.7 NOISE LEVEL

Noise level was also measured on project site, the noise level recorded at project site was 53 dB which is within PEQS.

4.3.8 WATER QUALITY

Ground water quality testing was carried out to determine its suitability for use. Testing data shows that ground water is suitable for drinking. The results of ground water analysis show, almost all the parameters are within safe limits of PEQS.

4.4 ECOLOGICAL ENVIRONMENT

[4] Cited on December 21, 2019; Available on: https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/shekhupura_pakistan_1165221

The ecological environment of an area is generally considered sensitive to large-scale developments. Disturbances and imbalances in the ecological environment can adversely affect biodiversity features of an area. The biodiversity of an area generally reflects the abundance and richness of the biological and the ecological resources.

4.4.1 FLORA

a. Forests

The project site is devoid of any specific or major plantation except a few ordinary trees. There is no major forest plantation within the zone of influence of the project.

b. Trees

The diversity and distribution of plant species depends upon the availability of water and the underlying geology. The trees existing in the Study and Project Area mostly consist of Neem, Taali and Orange. The botanical names of trees present in study area are shown below in Table 4.1:

Table 4.1: Major Trees present in Study Area

Sr. No.	Local Name	Botanical Name
1	Neem	Azadirachta indica
2	Taali	Dalbergia sissoo
3	Orange	Citrus sinensis

c. Grasses

The common grasses present in Study and Project Areas are Boi Grass, Dab Grass and Gorkha Grass. The botanical names of above stated grasses are shown below in Table 4.2

Table 4.2: Major Grasses present in Study Area

Sr. No.	Local Name	Botanical Name
1	Boi Grass	Cyperus
2	Dab Grass	Desmost Achya
3	Frash Grass	Tamarix Aphylla

d. Shrubs and Herbs

The shrubs and herbs provide nutritious supplemental feed to livestock during lean period because they are perennial and have depth root systems. The common Shrubs and Herbs present in Study and Project Area are Karer, Jand, Aak, Kana and Lana; Botanical names of which are shown below in Table 4.3:

Table 4.3: Major Shrubs and Herbs of Study Area

Sr. No.	Local Name	Botanical Name
1	Karer	Capparis Decidua
2	Jand	Prosopis Cineraria
3	Aak	Calotropis Procera
4	Kana	Sueda Fruiticosa
5	Lana	Saccharum Munja

e. Endangered Floral Species

No such plant species is encountered at Study Area that is endangered or declared protected under national, provincial or local government definitions as well as international agreements/protocols ratified by Government of Pakistan.

4.4.2 FAUNA

The assessment on terrestrial fauna in the Study Area is based upon the field investigation and reports of Forest Department. A variety of animals is found in Study Area which is categorized as Mammals, Birds, Reptiles and Amphibians.

a. Mammals

The common Mammals found in Study Area are are Jackal, Dog and Monkey. Following Table gives the Common and Zoological names of Mammals:

Table 4.4: Mammals present in Study Area

Sr. No.	Common Name	Zoological Name
1	Jackal	Canis Aureus
2	Dog	Canis Lupus Familiaris
3	Monkey	Macaca Fascicularis

b. Birds

Native species of birds present in Study Area are Pigeon, Sparrow, Crow and Parrots. Common and Zoological names of birds are given in Table 4.5:

Table 4.5 Major Birds present in Study Area

Sr. No.	Common Name	Zoological Name
1	Pigeon	Columbidae
2	Sparrow	Passeridae
3	Crow	Corvus
4	Parrot	Psittaciformes

c. Reptiles and Amphibians

The native species of Reptiles and Amphibians observed in Study Area are Snake, Lizard and Frog.

Table 4.6: Common Reptiles and Amphibians of Study Area

Sr. No.	Common Name	Zoological Name
1	Snake	Serpentes
2	Lizard	Lacertilia
3	Frog	Anura

d. Endangered Faunal Species

None of the faunal species encountered at Study Area that is endangered or declared protected under national, provincial or local government definitions as well as

international agreements/protocols ratified by Government of Pakistan.

4.5 SOCIO-ECONOMIC ENVIRONMENT

This section provides an overview of the baseline information relating to the socio-economic environment of the Study Area. The information collected from the respondents comprised their occupation, civic facilities, educational and health facilities, agricultural status including livestock population.

4.5.1 DEMOGRAPHIC PROFILE OF SHEIKHUPURA

Sheikhupura formerly Kot Dayal Das is an industrial city in the province of Punjab slightly northwest to Lahore in Pakistan. Sheikhupura is bound by 6 other districts of Pakistani Punjab namely: Lahore, Nankana Sahib, Narowal, Hafizabad, and Gujranwala.

Population Statistics of district Sheikhupura is given below in Table 4.7[5]:

Table 4.7: Population Statistics of Sheikhupura District

District/Tehsil	Population	
	1998	2017
Ferozewala Tehsil	396,069	795,498
Muridke Tehsil	639,784	452,369
Sheikhupura Tehsil	1,555,424	1,049,264
Safdarabad Tehsil	272,500	227,715
Sharqpur Tehsil	197,220	150,747

[5] Cited on December 21, 2019; Available on Pakistan Bureau of Statistics

At the time of the 2017 census, Sheikhupura district had a population of 3,460,426 of which 1,786,383 were male and 1,673,242 females. 2,258,491 which is 65.26% of the population lives in rural areas while 1,201,513 which is 34.72% of the population lives in urban areas. 97.07% of the population spoke Punjabi, 1.28% Urdu and 1.01% Pashto as their first language. 96.10% of the population was Muslim and 3.77% Christian.

The overall literacy rate of Sheikhupura district is 43.8% and it is ranked 15th out of 34 districts of Punjab in terms of literacy rates. (PSLMs 2006-07)

4.5.2 EDUCATIONAL FACILITIES

There are 2,220 Public schools in District Sheikhupura. Out of which, 1,703 are Primary schools, 293 middle Schools level and 173 are High Schools and 51 are Higher. Sec/ Inter Colleges/ Degree Colleges (XIII-XIV)/ Technical & Vocational Institutions/Deeni Madaris.

4.5.3 HEALTH FACILITIES

The district Sheikhupura is in Punjab Province of Pakistan is served by a number of Private and Government hospitals offering best class medical facilities. The rural and urban areas are served by various medical centers and dispensaries offering modern medical facilities. There are 8 Rural Health Unit (RHC) and 80 Basic Health Unit (BHU) in district Sheikhupura.

4.5.4 TRANSPORTATION AND COMMUNICATION

Sheikhupura is the most accessible city of Punjab, where you can find public and private transportation 24/7 in a week.

B. Road links

The district Sheikhupura is linked with Lahore, Nankana Sahib, Narowal, Gujranwala through metalled roads.

C. Rail Links

Qila Sheikhupura Railway station is located in Qila Sheikhupura, Pakistan. The Qila Sheikhupura Railway Station lines are connected with Lahore. Qila Sheikhupura station operates 4 trains to different cities of the country. The famous trains operated from the station are Badar Express and Mianwali Express. All these trains are managed by Pakistan Railways.

4.5.5 INDUSTRIAL ACTIVITIES

Sheikhupura or Shekhupur, formerly Kot Dayal Das or Singhpuria or Virkgarh, is an industrial city in the province of Punjab slightly northwest to Lahore in Pakistan. The city is the headquarters of Sheikhupura District and is approximately 35 km from Lahore.

Sheikhupura Industrial area was established before the partition. After the 1947 it has been established as famous industrial city with the sole objective to develop and accelerate industrial pace with the establishment of heavy and large-scale industries, some of industrial units are as follows:

Paper and Board industry, Rayon producing industry, Steel Rerolling industry, Leather industry, leather shoes jackets and belts industry, Chemical industry, Pharmaceutical industry, Tractor manufacturing industry, Rice Processing industry, Stone and marble grinding industry, Textile manufacturing industry, Motorcycle manufacturing industry, Cycles manufacturing industry, Poultry and animal feed industry, Flour industry, Soap industry, Cable industry, PVC cable industry, PVC pipe industry, MS pipe industry, GI Pipe industry, Engineering & services industry, Power generation unit, Agriculture tools, Ethanol industry, Stainless steel industry, Automobile industry

4.5.6 WATER SUPPLY

There is an easy access to safe drinking water in Sheikhupura which is one of the basic rights and need of humans.

4.5.7 ELECTRICY SUPPLY

LESCO (Lahore Electric Supply Company) is the one and only electricity Distribution Company in Sheikhupura, and under its electricity supplies in district.

4.5.8 TELEPHONE FACILITIES

There are more than 73 telephones exchanges in district. Cellular phones services are also present in the district.

4.6 QUALITY OF LIFE VALUES

Quality of life is the general well-being of People of the area and the individuals of the area have non-nomadic life style and are living here from times of their ancestors. In the project area the main sources of income are trade and industries.

4.6.1 MOTHER TONGUE

The mother tongue refers to the language used for communication between parents and their children. Punjabi is the predominant language of the district followed by Urdu and English.

4.6.2 LITERACY RATE

The overall literacy rate of Sheikhupura district is 43.8% and it is ranked 15th out of 36 districts of Punjab in terms of literacy rates. 97.07% of the population spoke Punjabi, 1.28% Urdu and 1.01% Pashto as their first language.

4.6.3 RELIGION

The population of the district is predominant Muslims with 96.10% and second Christian with 3.77% Christian.

4.6.4 ETHNIC STRUCTURE

The main castes and groups of the Sheikhupura Districts are Arain, Jatt, Rajput, Pathan, Mughal, Sheikh, Kamboh and Gujjar.

4.6.5 HISTORICAL SITES IN SHEIKHUPURA

Sheikhupura is a historical place. Several rulers, such as Mughal emperors, Sikhs, and British, have ruled this city. Jahangir founded it along with the famous Sheikhupura Fort in 1607. Its old name was Kot Dayal Das. Historians also mention two more titles for this city; Virkgarh or Singhpuria, later renamed by Jahangir as Sheikhupura.

The city is famous for its historical places such as Qila or fort Sheikhupura and Hiran Minar. This fort was built by the son of Mughal emperor Akbar the Great, Jahangir. The name of this fort is attributed to Jahangir's nickname, Sheikhu.

A) SHEIKHUPURA FORT

Sheikhupura Fort is a Mughal-era fort built in 1607 near the city of Sheikhupura in Punjab, Pakistan. Although, there is no conclusive evidence supporting this, the Tuzk-e-Jahangiri mentions that the emperor assigned the job of constructing the Fort to Sikandar Moeen on his hunting trip to Hiran Minar in 1607AD.



B) HIRAN MIRAN

Hiran Minar was built during the reign of the Mughal Emperor Jahangir in a hunting reserve used by the Mughal royals. The reserve was built in a scrub forest, and allowed Mughal emperors to experience a sense of semi-wilderness near the imperial city of Lahore. The wild-reserve was used as a park where visitors could enjoy the sport of hunting. The minaret itself was built in 1606 C.E. as a monument to Emperor Jahangir's beloved pet antelope, Mansiraj, or "Lord of All Animal Beings". The practice of building such tomb-markers over the skulls of game animals is an ancient Persian custom. The minaret and tank were soon accompanied by a larger pavilion, built during the reign of



Shah Jahan.

CHAPTER # 5

STAKEHOLDERS CONSULTATION

5.1 STAKEHOLDERS CONSULTATION

Social acceptability of the project and the area is a key to success. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and built understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long-term viability and enhances its benefits to locally affected people and other stakeholders.

In order to evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. To identity the different types of stakeholders and ascertain their perceptions about the project, an initial environmental examination was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following pages.

5.2 OBJECTIVES OF CONSULTATION

Public consultation plays a vital role in studying the effects of the project on the stakeholders and in the successful implementation and execution of the proposed project. Public involvement is a compulsory feature of environmental assessment, which leads to better and more acceptable decision making. The objective of the consultation with stakeholders is to help verify the environmental and social issues that have been presumed to arise and to identify those which are not known or are unique to the construction of the proposed unit.

The important general objectives of the consultation process are:

- Information dissemination, education and liaison;
- Identification of problems and needs;
- Collaborative problem solving;
- Reaction, comment and feedback on proposed project;
- Documenting mitigation measures proposed by the stakeholders;

5.3 METHODS OF PUBLIC CONSULTATION:

The EIA team carried out public consultations at various locations around the Project Site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, Govt. offices, shops, etc. near the Project area:

- Selection of the stakeholders for consultation, reconnaissance of the proposed project site and initial discussions with the neighboring industry workers, villagers, shopkeepers, drivers etc.
- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

5.2.1 PROPONENT

Possible impacts and mitigation measures related to the subject project were discussed with the project proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environment friendly.

5.2.2 RESPONSIBLE AUTHORITY

Management of M/S Panther Tyres Limited is the responsible authority to take all measures prior to start the activity.

5.2.3 ENVIRONMENTAL PRACTITIONERS AND EXPERTS

Team of M/S Elite Environmental Solutions Pvt. Ltd visited the project site, had discussions with stakeholders and consulted with the local people of nearby and

other villages to evaluate the project socio-economic impacts. People provide the massive information about the project and have positive remarks regarding the project development.

5.2.4 OTHER DEPARTMENTS AND AGENCIES

For the impact analysis detailed meetings were held with the management of M/S Panther Tyres Limited local community, education institutes, health institutes, hospital and NGOs. Issues were discussed that may affect the environment and also the implementation of proposed project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultations is to obtain the feedback from the relevant persons.

5.2.5 AFFECTED & WIDER COMMUNITY

There is no affected community present in the radius of our study area. EES team has consulted with the inhabitants of the different villages. They provided positive remarks regarding the subject project and in the favor of the subject activity for the proposed plant. Stakeholders' participation Performa's and socioeconomic questionnaire were get filled by the inhabitants to evaluate the project socio-economic impacts. List of respondents and socioeconomic questionnaires are attached as Annexure-G with the report.

Categories of stakeholders interviewed in the project area:

Sr. No.	**Stakeholder Category**		
1.	**Neighboring factory workers.**	**5.**	**Proponent**
2.	**Nearby residents**	**6.**	**Environmentalist**
3.	**Shopkeepers.**	**7.**	**Community/Locals**
4.	**Drivers.**	**8.**	**Govt. Job Holder**

In addition to the above categories, authorities of administrative and educational institutions, commerce and Investment Department (C&I), Environmental Protection Department (EPD) etc. were also consulted for more effective participation and appraisal of the proposed project.

Name of Stakeholders Along with their views and comments:

Sr. No.	Name of Respondent	Category/ Department	Comments
1	Mian Faisal Iftikhar	Proponent	This project has been planned to improve reliability and efficiency of power supply by newly constructing transmission lines and grid stations on project site.
2	Ahsan Majeed	Environmental Management Team Member	This project will be beneficial for the environment as well as for the public community. All the impacts will be mitigated according to the EMP.
3	Iram Shahzadi	Environmental practitioner	The environmental friendly technology will be used for the protection of surrounding areas from noise by providing the buffer zone and they are also implemented according to the EMP.
4	Hafiz Tahir	EHS Team Member	Safety of the worker will be make sure and all safety practice will be implemented
5	Abbas	Community	He was in favor of the Project and showed no negative concern about the Project. These are contributing to economic development and improvement of living standards of local residents.
6	Showaiz Rasheed	Community	He was fully encouraging the installing of grid station by saying that it provide Reliable, Stable and Secured Power supply to the end user.
7	Muhammad Ikram	Govt. Job	He overall favored the project by saying that the establishment of proposed project will not affect any residential community so it is a positive step for the betterment of mills.
8	Zafr Iqbal	Community	He showed positive response towards industrial development of the country by increasing its economic growth to cater the current economic crisis of the country.

9	Shahid Nadeem	Govt. Job	By showing concern towards generating employment opportunities, he fully supported the project.
10	Rana Zohaib Munir	Community	He favored the project by focusing on its positive impacts meanwhile on its mitigable temporary environmental impacts.
11	Ali Arshad	Community	By focusing at the generation of local employment opportunities to skilled unemployed labors he overall favor the project.
12	Ghulam Fareed	Govt. Employee	He was of the view that these kind of projects are crucial for the development of the city and will upraise the economic status of the city.
13	Wahid Iqbal	Local	The conditions of the power transmission system in Pakistan are inadequate to meet rapidly growing demand for electrical power. This situation limits national development and economic growth. To cope with the constraints, the power transmission infrastructure has to be improved, expanded and upgraded. So this project will be beneficial.
14	Muhammad Kamran	Local	He said that many local people are getting employment opportunities by the project.
15	Muhammad Khalid	Local	Show the positive response in favour of the project.

5.3 ISSUES DISCUSSED:

Following issues were discussed during the stakeholder consultation:

- Overall activities of the project;
- Possible impacts on natural vegetation, air, land and properties;
- Possible mitigation measures;
- Benefits of the project specifically for the local people.

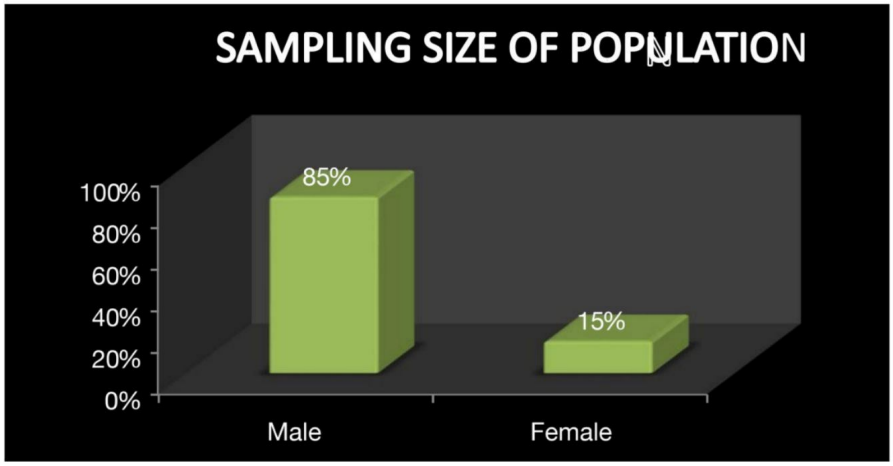
5.4 SAMPLE SIZE

Sample size of 40 respondents was selected by the Team of consultants for conducting the socioeconomic survey. Women were also consulted for the said survey; some of their names are mentioned in the above list of respondents while most of them were not willing to give personal information.

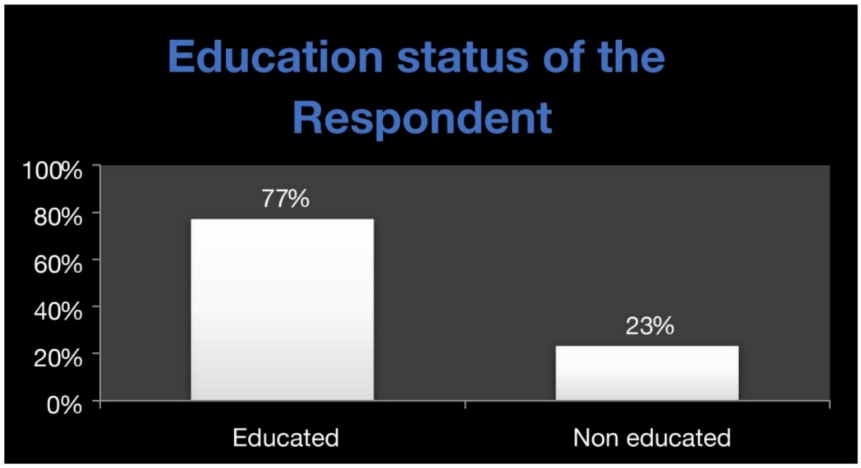
5.5 STATISTICAL ANALYSIS

SPSS 19.0 has been used for the statistical analysis of the data collected during the visit of study site area through questionnaires.

Graphical representation of analysis is given below:

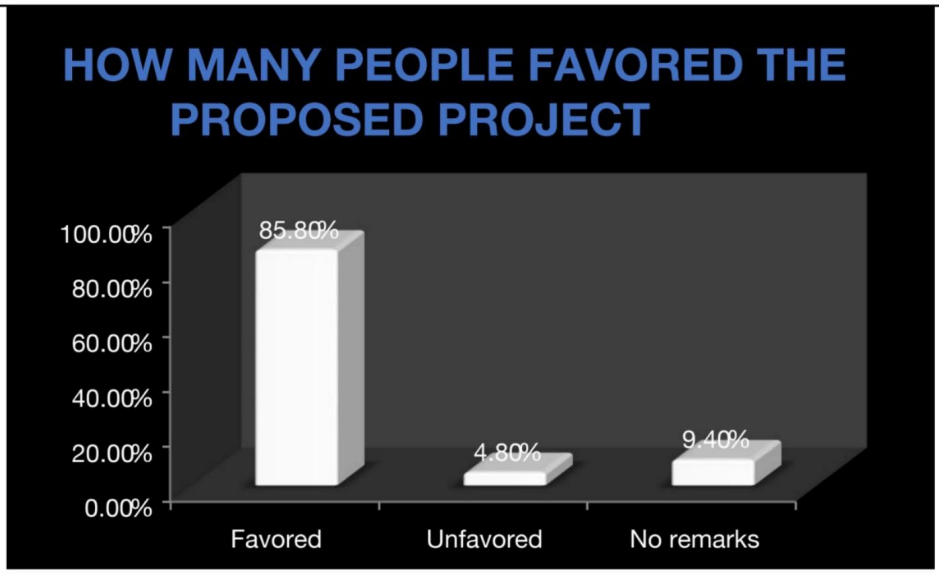


In the sampled population, 85% respondents were male while 15% respondents were female. The number of female respondents is less as compared to male respondents because according to the social binding female hesitates to respond or communicate

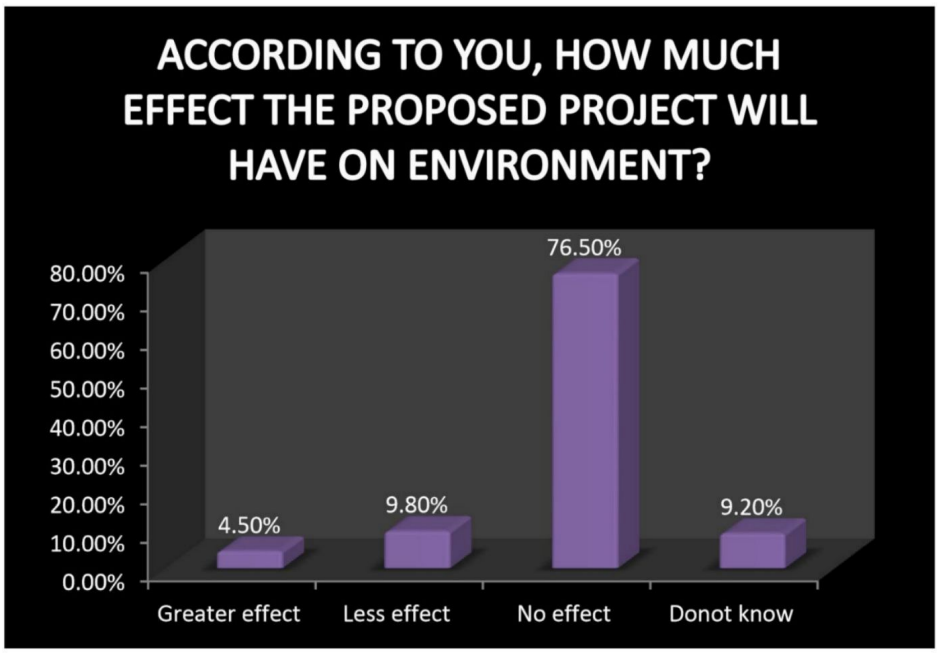


comfortably.

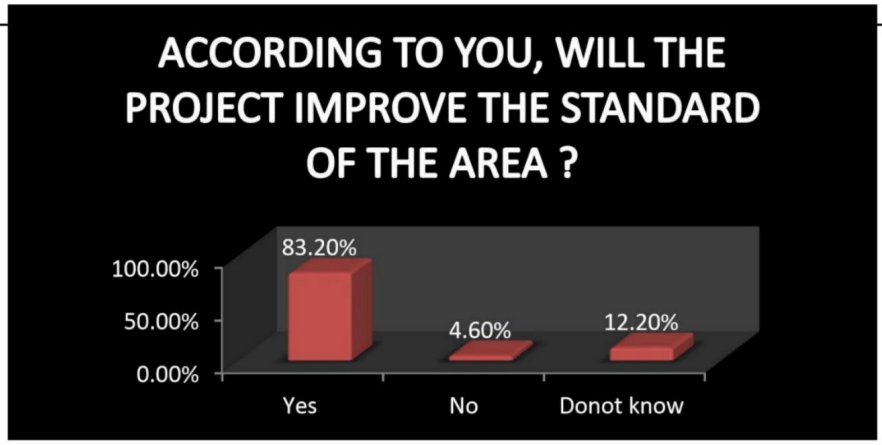
In the sampled population, 77% respondents were educated while 23% were uneducated. Overall education status of the area is good.



As per survey, 85.80 % people favored the proposed project and they gave positive remarks regarding the subject project. While 9.40% respondents had no opinion regarding the project and 4.80% respondents were not satisfied with the proposed project because they think that development will affect the natural aesthetics of the area.



As per survey, 4.50% respondents said that subject project will affect the environment of the area, 9.8% said that there will be less effect on the environment, 76.50% respondents said that the project will not affect the environment and 9.20% said that they have no idea regarding the subject project. Most of the population was not aware about the environmental importance; they were giving their remarks according to their own knowledge.



As per survey, 83.2 % people said that the project will improve the standard of the area, 4.60% said that it will have no impact on the area while 12.20 % respondents gave no remarks.

5.6 CONCLUSION

- After the completion of the proposed project the site will be used for industrial activities.
- It will enhance the socio-economic conditions/values of the area.
- Project will increase revenue generation for the Government.
- It will create employment opportunities.
- Local people will be given preference for employment in the proposed project.
- Construction of the proposed project will be completed in the designated timeframe to limit adverse impacts of construction.
- There will be no significant additional load on the existing infrastructure i.e., utilities of water, telephone, electricity etc. due to the development of the proposed project.

Majority of people favored the proposed project in a sense that the construction of the said project will generate employment opportunities for local people and revenue for the government, will enhance the socioeconomic conditions of the area and automatically will contribute to the national economy of the country.

CHAPTER # 6

ENVIRONMENTAL IMPACTS & THEIR MITIGATION MEASURES

The anticipated impacts related to project location, design, constructional and operational phases have been assessed and mitigation measures are provided accordingly. The following chapter describes the overall possible environmental impacts of project on the physical, biological and socioeconomic environment because of construction and operation phases and mitigation measures to minimize the significance of the possible impacts up to an acceptable level.

6.1 ENVIRONMENTAL IMPACTS DUE TO PROJECT LOCATION

Proposed site does not fall in the category of sensitive area and no environmentally sensitive localities exist within radius of study area. The only issue which can arise due to the location of the subject project could be the issue of traffic congestion due to transportation of the construction material at the project site. If the project proponent maintains HSE conditions and comply with the PEQS limits than, there will not be any significant impacts of the project on the environment.

If the mitigation measures are effectively implemented, the residual impact of the Subject project activities on the area's geophysical environment is expected to be insignificant.

Impact significance: Low or may be positive

Nature of impact: Direct

Duration: Long-term

Timing: Operation phase

Reversibility: NA

Likelihood: Low (unlikely),

Consequences: Mild or may be positive

6.1.1 MITIGATION MEASURES FOR LOCATION PHASE IMPACTS

- Project site should have good road infrastructure and efficient road infrastructure already exists there that is used currently to access the site and there is no issue of the road congestion due to the wide, good and paved road.
- Location can be considered as the positive impact due to transmission of electricity in the same area.
- The project will provide the jobs to the local residents as well as to those from the suburban areas.

6.2 ENVIRONMENTAL IMPACTS DUE TO THE PROJECT DESIGN

Subject project is the proposed Installation of 132 KV Grid Station by M/S Panther Tyres Limited situated at 29.5-KM Lahore Sheikhupura Road, District Sheikhupura, Pakistan". Area for parking, solid waste management and waste water treatment facility will be reserved within the subject project. Firefighting plan, health & safety plan, tree plantation plan, emergency response plan will be incorporated during the designing phase of the project. The subject project will consist of; Following are the major Environmental impacts due to the development related to the design:

- Soil structure and soil bearing capacity
- Road infrastructure design
- Emergency exit in the proposed project
- Firefighting system
- Wastewater disposal system design
- Rain water harvesting capacity of the drainage system
- Electricity hazards

Impact significance: moderate to high or may be negative

Nature of impact: direct

Duration: Long-term

Timing: Constructional phase & Operation phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high or may be negative

6.2.1 MITIGATION MEASURES AND RECOMMENDATIONS

Following are the mitigation measures and recommendations to minimize the anticipated impacts:

- Emergency exist points should be marked within the project building.
- Firefighting system should be designed for the emergency situations.
- Electricity system should be designed safe and sound.
- Electricity wires should be covered by thick plastic/electricity resistant covers.

6.3 ENVIRONMENTAL IMPACTS DURING THE CONSTRUCTION PHASE

Impacts related to the construction phase of the subject project are discussed below:

- **Grubbing and stripping**

Grubbing and stripping may be a minor and short-term impact on the physical environment during the construction phase. It may also be a health and safety hazard for the people at or near the project site.

- **Leveling and compaction of the land**

Leveling and compaction of the land is also a short term and minor impact on the physical environment and it may also be a health and safety hazard for the workers.

- **Demarcation of project building and other facilities**

It may also be a minor impact on the physical environment due to the subject project.

- **Generation of dust during loading and unloading of construction materials** It is also a minor and short-term impact on the physical environment and also for health and safety, which may arise during the construction phase.

- **Generation of noise on account of vehicular use and construction activities** It is also a minor and short-term impact on the physical environment and also for health and safety, which may arise during the construction phase.

- **Gaseous emission due to the vehicles**

It may also be a minor impact on the physical environment during the construction phase, if vehicles are not properly tuned.

- **Safety of construction workers, people in the surroundings and passersby**

Health and safety issues may arise during the construction phase if proper precautionary measures will not be taken.

- **Any outbreak of fire due to electrical and other failures**

This issue may arise due to carelessness or improper management, and it may be a serious hazard which may affect the environment or may also cause the loss of property or life.

- **Solid waste generation due to domestic and construction activities**

Solid waste generation due to domestic and construction activities may be a negative impact on environment if not managed properly.

- **Wastewater generation from the domestic and constructional activities**

Wastewater generation due to domestic and construction activities may be a negative impact on environment if proper wastewater treatment and management system will not be implemented.

- **Ground water quality**

Ground water quality may be affected by the development if proper mitigation measures will not be implemented.

- **Impacts on Fauna and Flora**

Construction will impact the flora/ vegetative cover and fauna present at the project site.

- **Security threat**

Security issue is a major socioeconomic impact which may arose during the construction phase.

- **Impact on land value**

Construction of the subject project may cause positive or negative impact on the land value.

- **Dislocation of the people**

Construction of the subject project may cause the dislocation of the local people if any, which is a negative impact on the socioeconomic environment.

- **Loss of public and private infrastructure**

Construction of the subject project may cause loss of public and private infrastructure if any, which is also a negative impact on the socioeconomic environment.

Impact significance: moderate to high or may be negative

Nature of impact: direct

Duration: Short Term

Timing: Construction phase

Reversibility: NA

Likelihood: moderate

Consequences: moderate

6.3.1 MITIGATION MEASURES AND RECOMMENDATIONS

- Precautionary measures should be adopted to save the environment from the impacts of grubbing, stripping, leveling and compaction and health and safety of workers should be ensured during the construction phase.
- Demarcation of the project building and other facilities should be according to the laws and regulations.
- Sprinkling of water on dusty tracks is recommended to avoid the generation of dust on dusty tracks.
- Vehicles should be properly tuned to reduce the impacts of dust and noise.

Proper mitigation measures should be taken to reduce the noise generation during the construction activities.

- PPEs i.e., ear muffs, helmets and masks etc. should be provided to workers to ensure their health and safety during the construction activities.

- Precautionary measures should be taken to reduce the local flooding due to over-use or leakage of pipes.
- Health and safety of construction workers, people in the surroundings and passersby must be ensured.
- Precautionary measures should be taken to avoid any outbreak of fire due to electrical and other failures.
- Constructional waste should be used for landfilling purposes.
- Domestic solid waste should be kept in dust bins and should be handed over to local contractors.
- Wastewater treatment facility (septic Tank) should be incorporated in the design of the project to treat the wastewater produced due to constructional and domestic activities before the final disposal.
- Add more vegetation to restore the land by more plantations.
- Essential services like water supply, sewerage disposal and solid waste management must be in working condition.
- Construction timings should be scheduled to cause minimum disturbance to neighbors.
- Because of presence of security guards round the clock the security at the project site will be improved as well as in its vicinity. Impact will be moderate positive.
- Land value in the surrounding area will increase due to completion of the present project. Impact will be moderate positive.
- The project does not involve dislocation of the people. There is no requirement of resettling a single person. Impact is nil.
- No movable or immovable property and infrastructure of public and private sectors will be lost or damaged during construction and operation stages. Impact will be nil.

6.4 ENVIRONMENTAL IMPACTS DURING OPERATION STAGE

Main environmental issues associated with Project operation are as follows.

- Health and safety issues for workers may arise during the project process.
- EMFs generation at the operational phase when the current is passed from the lines
- EMF causes changes in flight directions of migratory bird EMF has some effects on human health, such as neuropsychological disorders or cardiovascular diseases.
- Fire due to short circuits and other activities.
- Solid waste generation due to domestic and project related activities.
    - Noise pollution from generator and other machinery.

- Health hazards including the electricity hazards.

Impact significance: moderate to high or may be negative

Nature of impact: direct

Duration: Long-term

Timing: operational phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high or may be negative

6.5 RECOMMENDATIONS

- Safety of workers should be ensured through proper training and PPEs must be ensured during the working hours.
- A well design firefighting system will be constructed to cope with fire situations in the subject project.
- Appropriate cabling with protective shields to suppress electron flux • Health-based exposure limits must be mandated to protect public health
- A labeled zone shall be highlighted to indicate EMF in the area.
- Solid waste bins should be installed at designated processes and Installed Solid waste bins should be regularly cleaned and solid waste must be handed over to the EPA Approved contractor.
- Sludge from septic tanks will be handed over to the certified contractors.
- Electricity monitoring/Thermography should be conducted by the proponent quarterly for the safe supply.
- Project proponent should submit all the monitoring reports in the EPA Punjab for the compliance of the PEQS.

6.6 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

The proposed project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during construction and operation:

Sprinkling of water will be done on dusty roads and tracks.

- PPEs will be provided during construction activity.
- Constructional waste and domestic solid waste will be disposed-off or utilized properly.

- Local people will be informed in advance when work is about to start in an area.
- Machinery will never be left unattended.
- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed.
- Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction.
- Machinery will be kept maintained.
- Waste water will be treated through waste treatment system that will be installed within the premises of the subject project.
- Proper SOPs will be followed with proper schedule along with the HSE conditions.
- Area will be restored with native plants. A proper tree plantation plan will be formulated to save the environment.
- Solid waste will be handed over to contractors and agreement will be made.
- Noise will be controlled by adopting proper measures.
- PPEs will be provided to workers during working.
- Firefighting equipment's and system will be installed.
- Safety signs will be placed at all locations where required.
- Hygienic conditions will be ensured and proper quality will be maintained by quality control testing.
- First aid facilities will be made available.

6.7 METHODS FOR IMPACT IDENTIFICATION:

The methodology adopted for impact evaluation includes the Project Impact Evaluation Matrix.

6.7.1 PROJECT IMPACT EVALUATION MATRIX

The impact Evaluation matrix was developed by placing project activities on x-axis and different environmental parameters likely to be affected by the proposed project actions grouped into categories i.e., Physical, Biological and Socio-Economic Environment. For the impact assessment, project impact assessment matrix is used by dividing the project action into different phases (Construction phase and operation phase). A project impact evaluation matrix is attached in next section of this chapter.

The evaluation of impacts has been carried out on the basis of developing matrix, in which impacts have been rated on the basis of their significance. For rating impacts significance following criterion has been developed;

NA – Not Available

O – Insignificant (No or minimal impact)

LA – Low Adverse (Short term, reversible or less damage to environment)

MA- Medium Adverse (Long term reversible damage to environment)

HA – High Adverse (severe irreversible adverse damage to the environment)

LB – Low Beneficial (Short term benefits or less beneficial to the environment)

MB – Medium Beneficial (Long term benefits to environment)

HB – High Beneficial (Continuous benefits to environment

	Physical Environment							**Biological Environment**		**Socio-Economic Environment**							
Environmental Component / Project Activities	**Topography & Drainage**	**Soil Quality**	**Landscape**	**Surface water quality**	**Ground water quality**	**Air quality**	**Noise**	**Flora**	**Fauna**	**Agricultural Land**	**Health & Safety**	**Disruption of Public Utilities**	**Employment**	**Population Disturbance**	**Social Disorder**	**Cultural Values**	**Traffic Management**
Placement of construction machinery on site	LA	LA	MA	LA	O	O	O	MA	LA	MA	LA	O	O	MA	LA	LA	HA
Parking of heavy vehicles	LA	O	LA	O	LA	O	O	LA	O	LA	LA	O	O	MA	MA	MA	HA
Transportation of raw construction material	LA	MA	MA	LA	O	HA	HA	MA	HA	LA	HA	O	MB	HA	HA	LA	HA
Temporary storage of raw material	LA	LA	LA	MA	LA	MA	O	LA	O	LA	LA	O	LB	LA	O	O	HA
Loading and unloading of raw material	LA	LA	MA	MA	O	HA	MA	LA	LA	LA	MA	LA	MB	HA	LA	O	MA
Labour camping on site	O	O	LA	LA	O	O	LA	LA	O	LA	LA	HA	O	HA	MA	MA	O

Storage of oil and fuel	LA	MA	LA	LA	O	LA	O	LA	LA	LA	MA	O	LB	O	O	O	O

Extraction of ground water	O	O	O	O	MA	O	O	MA	O	MA	LA	HA	O	O	LA	O	O
Construction material mixing/ preparation	LA	MA	LA	LA	LA	LA	HA	O	O	O	HA	HA	HB	MA	LA	MA	O
Welding/ cutting and steel fix ring process	O	O	O	O	O	MA	HA	O	O	O	HA	O	HB	MA	LA	LA	O
Shuttering/ beams	O	O	O	O	O	MA	HA	O	O	O	HA	LA	HB	MA	MA	MA	O
Excavation	HA	MA	MA	LA	LA	HA	HA	MA	LA	O	HA	O	HB	LA	O	O	O
Water tank/ pond on site for temporary storage	O	O	O	LA	LA	O	O	O	B	O	LA	LA	B	LA	O	O	O

Legend: O=Negligible/No impacts B=Beneficial LA=Low Adverse MA=Medium Adverse HA=High Adverse

6.7.2 IMPACT ANALYSIS AND PREDICTION:

In order to evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. For the impact analysis and predictions following methods were adopted:

a) CONSULTATIONS/ CASE STUDIES:

To study the impacts of the project on physical and biological environment, site visits were conducted by the environmental practitioners and experts and possible physical and biological impacts which may arise due to the subject project were identified through consultations and case studies and their mitigation measures were suggested accordingly.

b) MEETINGS:

For the identification of the social impacts of the project, meetings and group discussions were held with the local people, stakeholders, nearby residents and passerby because social acceptability of the project and the area is a key to success. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and built understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long-term viability and enhances its benefits to locally affected people and other stakeholders.

To identity the different types of stakeholders and ascertain their perceptions about the project, an initial environmental examination was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following.

The EIA team carried out public consultations at various locations around the Project Site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices, Govt. offices, shops, etc. near the Project area:

1- Selection of the stakeholders for consultation, reconnaissance of the proposed project site and initial discussions with the neighboring factory workers, villagers, shopkeepers, drivers etc.

2- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

6.8 ENVIRONMENTAL IMPACTS ASSESSMENT

The project activities during construction phase will involve clearing of trees along the route alignment wherever required, excavation for installation of towers, erection of towers, civil works related to transmission line and line stringing. For Grid station, it will involve excavation for building and equipment foundations, civil works and erection of equipment.

During the operation phase, most of the construction phase impacts will get stabilized and the impacts will be restricted only to the operation and maintenance of the project.

The impacts on the environment from various activities of the project can be categorized as follows:

6.8.1 IMPACT ON PHYSICAL RESOURCES

1. Impact on Topography

6.8.2 IMPACT ON ENVIRONMENTAL RESOURCES

1. Impact on Air Quality
2. Impact on Noise Levels
3. Impact on Surface Water Quality
4. Impact on Ground Water Quality
5. Impact on Soils and Geology

6.8.3 IMPACT ON ECOLOGICAL RESOURCES

1. Terrestrial Ecology
2. Wild Life
3. Aquatic Ecology

6.8.4 IMPACT ON HUMAN ENVIRONMENT

1. Health and Safety
2. Agriculture
3. Socio-economics
4. Resettlement and Rehabilitation
5. Cultural sites

6. Traffic and Transport

6.8.5 WASTE DISPOSAL

1. Solid waste disposal
2. Liquid waste disposal

6.8.1 IMPACT ON PHYSICAL RESOURCES

1. IMPACT ON TOPOGRAPHY

During the construction of the transmission line and substation, the topography will change due to excavation and erection of tower, fill and cut for leveling the tower erection place. The most prominent impact on the surface topography will be due to the removing of the vegetation at the tower erection site and all along the Right of Way for construction facilitation.

This will lead to change in the surface features only. The impact will be irreversible as the present features along the 15m Row will be changed due to presence of the transmission line. No topographical changes are envisaged during the operation phase of the transmission line and the substation. The existing access routes will be utilized during the operation and maintenance of the transmission lines.

IMPACT ON ENVIRONMENTAL RESOURCES

1. IMPACT ON AIR QUALITY

During the construction phase, the activity would involve excavation for the tower erection, movement of transporting vehicles carrying the construction materials etc. along the haul road (through un-built roads, but are not maintained). At majority of locations, movement of heavy vehicles may not be possible; from approach road to construction site material will be head loaded. All these activities would give rise to emission of dust particles thereby affecting air quality marginally at the site which will be transitory in nature.

MITIGATION MEASURES

Sprinkling of water during excavation will reduce the dust emission to a great extent. The operation of transmission line and the Grid station will not have any negative impact on the air quality of the region.

2. IMPACT ON NOISE LEVELS

During the construction phase, the major sources of noise pollution are movement of vehicles transporting the construction material and equipment to the site. Most of the access roads along the alignment are feasible for motor vehicles. The major work of the construction is expected to be carried out during the day time. All areas have heavy load of traffic and public access. People shall be fairly warned about the severity of the works.

MITIGATION MEASURES:

Following measures will help to keep noise and vibration in acceptable level during Construction phase:

- Contractor shall equip their heavy construction equipment and plants with exhaust silencers to limit the engine noise so as not to exceed 75 dB (compacters, loaders, vibrators and cranes) and regularly maintain all construction vehicles and machinery that should meet the Punjab Environmental Quality Standards.
- Contractor shall limit working time for activities that create noise only from 7.00 am to 8.00 pm except for construction site near public sensitive receptors. Construction related activities closer to sensitive receptors have to be scheduled in coordination with the relevant authorities. During the operation phase of the project, there will be corona noise from the conductors which will be felt only up to 15 to 30 m area; hence the ambient noise level shall meet the 85dB limit of NEQS.

3. IMPACT ON SURFACE WATER QUALITY

The construction and operation of the transmission lines will not have any significant impact on the surface water quality in the area since no surface water body was found. Proposed activities will create temporary impacts to the existing drainage system in the area. Stagnation of water will also create temporary breeding sites to mosquitoes, which will have direct impact on public health.

MITIGATION MEASURES:

Ensure that minimum water is lost during construction activities and no water remains stagnant at any place.

4. IMPACT ON GROUND WATER QUALITY

Ground water contamination might take place during construction activities. In case of an accidental spill or maintenance works of vehicles, machineries and different components of the transmission line and grid station; chemical substances and oily wastes, which are often used in the construction vehicles and machineries, may leach into the soil and percolate to the ground water. In rainy seasons, the quality of soil is vulnerable since the porosity increase and leachate formation is escalated which may eventually bring an impact on the ground water resources.

MITIGATION MEASURES:

Thus, following measures will be required in order to prevent deterioration of water from the construction and construction related activities:

All construction vehicles and equipment should be maintained in proper conditions to avoid any leakage

- Contractors shall use silt traps and erosion control measures where the construction is carried out in close proximity to the water bodies to avoid cement particles, rock, rubbles and waste water entering the surrounding water bodies.
- Construction activities should be restricted to dry season.
- All liquid raw materials and semi-liquid components must be kept at impermeable floorings and covered properly with appropriate labeling which shall avoid any leakage that might occur due to accidental spill or rain water runoff.

5. IMPACT ON SOIL AND GEOLOGY

Project activities including excavation, cut and fill operations, removal of trees and green cover vegetation etc., will enhance the soil erosion during the rainy season. Removal of trees and green cover vegetation will reduce infiltration rate of rainwater. The impact on soils will be due to the soil erosion at the tower construction site and along the access routes. Excavation activity and land clearance in the erosion prone areas have to be minimized while conducting site selection for towers. Leveling and stabilization of tower construction sites will be done after completion of construction activity which will avoid surface runoff and damage to the topsoil.

MITIGATION MEASURES:

The impact associated with landslides due to excessive erosion and other civil works can be avoided or minimized by following mitigation measures:

- Maximum effort should be taken to minimize removal of trees and green cover vegetation.
- Minimize obstruction or destruction to natural drainage pattern of the surrounding area.
- Proper treatment of clearing and filling areas against flow acceleration
- Turfing work should be taken prior to rainy season around the Grid station.
- Contractors shall restrict cut and fill operation around sharp/deep slope areas.
- Top soil (2-3 cm from the top of the soil), which is removed during construction from the cultivated lands must be stored separately for future utilization of cultivated lands near tower leg locations.

6.8.3 IMPACT ON ECOLOGICAL RESOURCES

There is no national wildlife park, bird sanctuary, wetland in the route alignment of the proposed transmission line. The study area for route alignment has sparse plantations area.

The ecological impacts are briefly described in the following sections

1. EFFECT ON FLORA AND FAUNA

None of the declared environmentally sensitive areas is located within the project-affected area since it is an urban settlement. Migratory paths of small mammals and reptiles may be affected due to construction activities. However, noise, vibration and emission from construction vehicles, equipment will occur during construction and pre-construction stages in temporary manner.

MITIGATION MEASURES:

The impacts related to above activities are temporary and can be mitigated through following measures:

- Strict attention on worker force regarding disturbance to surrounding habitats, flora and fauna including hunting of animals and unnecessary cutting of plants
- Construction activities must begin with low intensity which may serve as an early warning system for the fauna to leave the area and go to safer areas
- Ensure habitat conservation by avoiding dumping of construction and sanitary waste like debris, bricks, gravel, litter, food leftovers in open areas and seek a place with the municipal office to extricate a place to release them.

2. IMPACT ON TERRESTRIAL ECOLOGY

There is no sensitive ecological area / protected forest area such as national wildlife park, or bird sanctuary crossing the proposed route alignment. The removal of herbaceous vegetation from the soil and loosening of the top soil generally causes soil erosion. However, such impacts would be primarily confined to the project site during initial periods of the construction phase.

MITIGATION MEASURES:

These would be minimized through adoption of mitigation measures like paving and surface treatment and water sprinkling.

3. REMOVAL OF TREES

No plant species will be removed from the area. The initial construction works along the alignment involving land clearance, cutting, filling, and leveling may cause loss of vegetation. This will be irreversible impact.

MITIGATION MEASURES:

Care has been taken to avoid the thick plantations/vegetation as far as possible and tower locations are selected at plain paddy fields where the vegetation is thin. This will minimize the tree loss. Replanting of similar species with the ratio of 6 against 1 will be implemented.

6.8.4 EFFECT ON LOCAL ROAD NETWORK

Transformers, tower material, substation equipment, iron bars, concrete materials, equipment etc. will be transported through the provincial and local road network to the project site. Heavy transportation vehicles might disturb the local traffic specially at peak working hours. Excavation at roads will bring impact on traffic flow and also lead to traffic jams. Visibility is usually minimum during night time where there are fewer street lights, this will pose as a hazard for the local traffic travelling in night time.

MITIGATION MEASURES:

- Contractor should properly maintain all road sections, which will be utilized for the construction related activities
- Construction vehicles will only be allowed to operate at times when there is minimum traffic load
- The site that has to be excavated will be barricaded by means of safety signs and symbols, such as using reflectors to improve indication of excavated sites in night time
- Diversion routes must be allocated for normal and construction vehicular traffic to maintain normal traffic flow
- Emergency routes must be kept clear and ensure that they are easily accessible.

6.8.5 IMPACT ON HUMAN ENVIRONMENT

1. HEALTH AND SAFETY

Health and safety are one of the major concerns during the construction and operational phase, almost all activities are having potential to cause harm, this includes; Manual lifting of construction material resulting in severe body pains as well as work related stress.

The activities like manual lifting, lifter operation as well as operations of other construction vehicles and other activities associated with construction and operation phase will enhance the work-related stress. The accidents may be caused due to electrocution, lightening, fires and explosions. The local people living nearby the site where excavation and erection has to be done are more susceptible to road side accidents and noise. Improper lifting of extra tools and storage, while erecting towers is a potential

hazard. The accidents may be caused due to electrocution, lightening, fires and explosions.

MITIGATION MEASURES:

- Organize awareness programs relevant to personal safety of the workers and public in the area
- Installation of warning signs to particular locations such as transverse points of local road network by transmission lines, additional workers and general people specifically children will not be entertained for accessing the work place especially during erection
- Necessary training regarding safety aspects to the personnel working at the line will be provided by the contractor

- Ensure that hazards associated with manual lifting are controlled by proper lifting techniques, work rotation system will reduce the chances of being exposed to work related stress associated with construction activities
- All the workers involved in construction, operational and maintenance activities will be provided with proper PPEs including; safety belts, footwear, helmets, goggles, eye shields, and clothes to workers depending on their nature of work
- During operational phase it will be ensured that the site having high electrical voltage will be barricaded by means of impermeable walls, this would reduce the probability of being exposed to severe electrical shocks
- Only trained operators will be allowed to access high voltage area.

2. SOCIO-ECONOMICS

Social services like road, traffic, utility lines as well as routine market activities and general business may be affected, however the impact is only limited to the construction phase. The positive impact during construction of transmission line will generate local employment, as number of unskilled labors (men/women) will be required at the time of construction activities, in summary there is no major impact on social environment, rather it is a developmental activity for the benefit of community.

MITIGATION MEASURES:

The following measures will have to be taken:

- Advance notice to the public as well as major utility providers about the time and the duration of the utility disruption, and restore the utilities immediately to overcome public inconvenience

- Alternate routes should be planned and will be kept clear to keep the traffic and general public services in flow and momentum.

6.9 ELECTRO MAGNETIC FIELDS (EMF)

EMFs are generated at the operational phase when the current is passed from the lines. There are no significant impacts on the environment but there are some aspects of minor concerns. EMF causes changes in flight directions of migratory birds. Moreover, referenced from WHO research archives, it is found that EMF has some effects on human health, such as neuropsychological disorders or cardiovascular diseases, but the data is not sufficient to confirm the risks, however more research is being done in this regard.

MITIGATION MEASURES:

There are no mitigations to consider, however the following steps can be taken to Minimize any possible risks:

- Appropriate cabling with protective shields to suppress electron flux.
- Health-based exposure limits must be mandated to protect public health.
- A labeled zone shall be highlighted to indicate EMF in the area.
- Telecommunication service providers must be alerted about the activities and the level of EMF in the corridors and around stations to minimize exceeding levels in other communication devices.

6.10 CONSTRUCTION WASTE MANAGEMENT

Almost all the activities from excavation to erection will generate waste, however the waste will be of inert nature, in addition the waste will mainly comprise of cement and concrete waste, the concrete material resulting from batching and mixing will harden the ground surface resulting in growth inhibition of plant growth. This would also result in unaesthetic environment of the site

MITIGATION MEASURES:

Thus, following measures are needed to protect and enhance the quality of environment during the construction stage:

- It is strongly recommended that waste should be reduced at source and by reusing the residual waste
- It will be ensured that waste will be segregated and collected, however recyclable waste will be sent to the recycling industry to generate revenue
- The waste which cannot be reused or recycled will be dumped to the proper and allocated containment facility

6.11 OTHER ENVIRONMENTAL IMPACTS

1. ELECTRIC SHOCK

This may lead to death or injury to the workers and public in the area.

Mitigation Measures:

This can be minimized or avoided by:

- Security fences around Grid station and looping areas
- Display of warning signs

3. NOISE GENERATION

Nuisance to the community around the site can occur during the project implementation stage.

MITIGATION MEASURES:

- Workers and operators, working in close proximity to the grid station will be provide adequate PPEs
- General public will be restricted to stay away from those areas to a safe zone
- Construction activities must be limited to day time and avoided at night
- Properly tuned vehicles and machineries will be used for all construction activities to reduce noise generation.

6.12 OIL SPILLAGE

Contamination of water on land/nearby water bodies by the transformer oil can occur during operation due to leakage or accident.

MITIGATION MEASURES:

Substation transformers will be located within secure and impervious areas with a storage capacity of 75% spare oil. Also, proper drainage facilities will be constructed to avoid overflow or contamination with natural flow paths

6.13 CONCLUSION

Management of M/S Panther Tyres Limited has to achieve the following goals.

- Identification of regulatory requirements that apply to the project activities in the context of environmental protection.
- Identification of the environmental features of the project area and the likely impact of the project on the environment,
- Recommendation of appropriate mitigation measures that management will incorporate into the project implementation to minimize all adverse environmental impacts.
- Baseline environmental and socioeconomic information collection from a variety of sources, including field surveys.

The impacts of project in area will be insignificant, provided the generic mitigation measures proposed in this report are implemented.

After assessing the project activities and investigating the project area, it is concluded that, if the activities are undertaken in this report, and the recommended mitigation and environmental management measures are adopted, the project will not result in any long-term or significant impacts on the local community or the environment.

CHAPTER # 7

ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

7.1 PURPOSE AND OBJECTIVES OF THE EMP:

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define the responsibilities of the project proponent.
- Define a monitoring mechanism and identify monitoring parameters in order to:
- Ensure the complete implementation of all mitigation measures.
- Ensure the effectiveness of the mitigation measures.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- Identify training requirements at various levels.

7.2 MANAGEMENT APPROACH:

The overall responsibility for compliance with the environmental management plan rests with the project proponent.

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

7.3 INSTITUTIONAL CAPACITY

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE/Project Manager
- In-Charge Administration
- Supervisor of project
- Environmental Engineer

7.4 TRAINING SCHEDULES

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged on biannually basis during the constructional phase of the project and on quarterly basis during the operational phase of the project. It will be imparted by a team of experienced trainers.

7.5 TRAINING OF CONTRACTOR

Training of contractor & workers will be the part of the TORs regarding the construction of the scheme. The provisions given in EIA Report *Chapter 6 Environmental Impacts & Their Mitigation Measures* will be followed.

TORs will be including the training and submission of reports in the following area:

1. Handling of Machineries in a safe way
2. Use of PPEs
3. Maintenance of vehicles and submission of Environmental Monitoring Reports
4. Maintenance of Water Consumption records
5. Testing of water and waste water and submission of Environmental Monitoring Reports
6. Placement of safety signs/boards during construction
7. Sprinkling of water on the roads and dusty tracks
8. Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

7.6 Institutional Arrangements, Environmental Reporting and Record Keeping

The organizational structure for the Environment Management Plan is outlined below:

- **PRIMARY RESPONSIBILITIES**

The primary responsibility for implementing EMP lies with the owner of Housing Scheme.

- **OPERATION MANAGEMENT & CONTROL**

Conducting the operational activities in environmentally sound manner will be the responsibility of the concerned Manager; for which he will be trained.

- **SUPERVISION & MONITORING**

Senior Supervisor will be responsible for all environmental issues and for the implementation of EMP.

- **EMP REPORTING AND RECORD KEEPING**

Concerned Manager will be responsible for all the applicable environmental reporting and record keeping related to the EMP.

- **EMP REVIEW AND REVISION**

The EMP will specify the procedures for the review and revision of the EMP during Project implementation and will have a version control procedure. At a minimum, the site-specific EMP will be reviewed by the Environmental Management Team to determine if an amendment or a major revision is warranted:

- At least once every six (6) months or on a seasonal basis;
- As a result of changes in the project or changes in the anticipated environmental effects of the project;
- After corrective actions will be taken in response to an environmental incident;
- after an adaptive management measure will be proposed by the Environmental Management Team;
- After a material revision of the EMP will be proposed by the Environmental Management Team. A material revision is one which would be relevant to the question of whether an adverse environmental effect is more likely to occur, or become more adverse, and be significant;
- After a material revision of the EMP is proposed that changes a commitment such as:
    - a reduction or increase of monitoring or reporting requirements; or
    - making a specification less stringent or more stringent.

Any proposed amendment or revision will be provided Environmental Management Team in writing for acceptance prior to action. Amendments and revisions will be tracked in accordance with an accepted version control procedure.

7.6 RESPONSIBILITY OF EMP

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint an HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage all HSE condition at the PEQS.

SUMMARY OF IMPACTS AND THEIR MITIGATION MEASURES

Serial	Environmental Issues/ Impacts	Mitigation Measures
PLANNING, SITE SELECTION AND DESIGN STAGE		
1	**Responsibilities of administrative and legal formalities**	The approval of all other approvals will be responsibilities of proponent after getting environmental approval.
2	**Acquisition of land**	The proposed land is the property of the project proponent.
3	**Loss of environmentally sensitive areas**	There is not any sensitive area near the project site however the project proponent will achieve the PEQS at the boundary wall of the subject project to avoid the environmental impacts on the nearby industrial unit.
4	**Changes in traffic pattern**	There is no need to change the traffic pattern due the development of the subject project only few vehicles will visit the project on daily basis.
5	**Potential conflicts with stakeholders**	There is not any conflict at the current stage of the project. Local residents were visited regarding their concerns. They have no objection regarding development of the subject project as per proposed design. It is recommended to settle the issues through scoping and specific group discussions.
6	**Resettlement issues**	No resettlement issues
7	**Project Design**	Provision of Emergency Exits, Assembly Points, firefighting arrangements, water storage for firefighting, EMF control arrangements should be incorporated in the design.

SITE DEVELOPMENT STAGE		
1	**Erosion due to stripping and site clearance**	Sprinkling of water on road sides or dusty tracks
2	**Generation of dust**	Careful loading and unloading of construction materials is recommended. Sprinkling of water on construction site and surrounding areas is recommended.
3	**Generation of noise**	• Avoid suing forbidden horns at the site. • Do not throw heavy equipment and construction materials in haphazard manner.
4	**Local flooding/ponding**	Immediate repair and maintenance of water supply pipes and sewers in case of any defect will be undertaken.
5	**Outbreak of fire**	Firefighting equipment must be maintained at the site in good working condition.
6	**Safety**	Safety of the workers and others must be ensured. Privacy of the neighbors must not be disturbed.
7	**Labor issues**	Employ the local labor as far as possible Wages of the labor should be as per Government policy
CONSTRUCTION STAGE		

1	**Minor erosion of land**	Wind Erosion • Clearing of land should be step wise; vegetation should be removed only from

		the area where main building will be developed. • Add more vegetation, restore the land by more plantation • Sprinkle water on dusty tracks is recommended
2	**Contamination of land and water**	Hazardous substances like oil, fuel, etc. should be kept on concreted surface. Essential services like water supply, sewerage disposal and solid waste management must be in working condition.
3	**Impacts of dust, noise and flue gases on neighbors**	Sprinkling of water on dusty tracks is recommended. Avoid suing forbidden horns at the site. Do not throw heavy equipment and construction materials in haphazard manner. Proper tunings of vehicles and machinery must be ensured. Schedule construction timings should be implemented for minimum disturbance to neighbors. Continuous Environmental monitoring must be ensured as per proposed monitoring plan.
OPERATION STAGE		
1	**Contamination of land and water sources**	Continuous vigilance on maintenance of services. Tarpaulin sheets must be placed to avoid leaching of oil into ground.

2	**Fire breakouts**	Training of workers regarding flammable
		substances will be ensured. SOPs of fire prevention will be adopted like forbidden of smoking, regular testing of electricity infrastructures. Firefighting equipment must be kept in working condition at site.
3	**Safety/security concerns**	Safety of the workers and others will be ensured. Privacy of the neighbors will not be disturbed.
4	**EMF generation**	Appropriate cabling with protective shields to suppress electron flux Health-based exposure limits must be mandated to protect public health A labeled zone shall be highlighted to indicate EMF in the area.
4	**Malfunction of utilities**	It is proposed to appoint maintenance engineer with technicians like plumber and electrician for smooth operation of utility services.

5	**Occupational Health, Safety and Environment**	• Regular medical check-ups must be ensured to improve the working condition and efficiency of workers. • Safety of management, workers and visitors must be ensured. • Observance construction and safety codes must be ensured. • Provision of emergency exits must be ensured.
6	**Production of Solid Waste**	Area for solid waste must be reserved within the subject project. The solid waste must be managed on regular basis. The domestic waste will be disposed-off in environment friendly way.

7.7 EQUIPMENT MAINTENANCE DETAIL

The subject project is the Installation of 132 KV Grid Station by M/S Panther Tyres Limited situated at 29.5-KM Lahore Sheikhupura Road, District Sheikhupura, Pakistan".

The company will maintain the records for Health Safety & Environment and will hire HSE manager to check and deal with the HSE issues. The company shall maintain PPEs, medical facilities, firefighting Equipment's as fire buckets, fire hydrants and fire extinguishers and records for their periodic fillings or replacement.

7.8 ENVIRONMENTAL BUDGET

The cost which is required to effectively implement the mitigation measures is important for the sustainability of the Project in operation stage of the Project.

Company will allocate the Environmental Budget of 500,000/- annually for the Training, maintenance and management of Environment that will include filling and maintenance of equipment's, restoration, plantation, and availability of PPEs, strategic planning to cope with any emergency situation and formulate the disaster management plan to cope with natural disaster. Any equipment or devices failure or replacement will not be included in this budget.

7.9 PURPOSE OF MITIGATION MEASURES

1. What is the problem i.e., in terms of "major environmental impacts" which may arise by the subject project activity?

The major impacts may arise by the subject project include particulate matter & dust, noise, solid waste and wastewater. Other impacts are of minor importance. These impacts will arise during construction and operation but precautionary measures will be adopted prior to start the activity, during the activity and post activity.

2. When the problem will occur and when it should be addressed?

Any impact that would arise due to the subject project activity will be addressed on site. Trainings will be conducted on site prior to start work while other precautionary measures will also be adopted to make the project safe and environment friendly.

3. Where and how the problem should be addressed?

HSE manager/environmental manager along with site manager will be appointed to assess any impact that could be arisen during both phases. He would be responsible to address the problem and to mitigate it.

4. Whys of achieving mitigation measures

a) Changing in planning and design:

By adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The details of impacts and mitigation measures have been discussed in previous chapters.

b) Improved monitoring and management practices:

Management of M/S Panther Tyres Limited take appropriate measures to provide pollution free and safe environment during the proposed project activity by implementing improved management practices and monitoring techniques suggested in EMP.

c) Compensation in money terms:

M/S Panther Tyres Limited adopt such plan that will assure the minimum impact on the environment and health by implementing proper mitigation measures. Design of the project will assure the structure stability and project life in a long run.

d) Replacement, relocation and rehabilitation:

Management of M/S Panther Tyres Limited develop Restoration/ reclamation or tree planation plan to restore the project area. Maximum Plantation will be done with native species within the building, along the boundary wall and along the road side if directed by EPA. Also, in-front of main area, horticulture plan will be formulated and area for this will be kept reserved.

7.10 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) is a framework for the implementation and execution of mitigation measures and alternatives. It usually covers all phases of the project, right from pre-construction to the operation and maintenance phases of the transmission line project. The plan outlines mitigation measures that will be undertaken to ensure compliance with environmental laws and regulations and to eliminate adverse impacts. The objectives of an EMP, thus, are:

- To ensure that mitigation measures are implemented;
- To establish systems and procedures for this purpose;
- To monitor the effectiveness of mitigation measures;
- To ensure compliance with environmental laws and regulations;
- To take any necessary action when unforeseen impacts occur;

ENVIRONMENTAL IMPACT MITIGATION PLAN

Aspects		Impacts
CONSTRUCTION PHASE		
1	**Land Disturbance**	
	The potential problems that can arise from land installation of underground cable is disturbance.	There is possibility of land disturbance at project area. It is expected that there are small chances of change in land at project area. The only change in land use for underground cables installation will be due to earth works and excavation activities which may damage paved road.
Mitigation Measures		➢ Earth work should be technically designed according to geological feature of project site. ➢ Obtain all the exact approved routes and locations which have been selected for grid station and shall issue "Notices of intent" to all concerned authorities at least four weeks prior to commencement of the work, such as the employer, Municipality, Telecommunication Department, Traffic police, etc. Also excavate the material with care to avoid damaging the existing services and electric cables. ➢ Excavation operations shall be confined to a minimum working area

		consistent with efficient operations. ➢ Damage to road, footpaths, ditches, etc. caused by the project activities should be repaired during completion of earth work on immediate bases. ➢ The trenches (excavated area) shall be located exactly within the approved reservation and no more than two adjacent sections of excavated trench shall be open at a time. ➢ Restore the paved and unpaved roads. Road need to be paved and backfilled rapidly and properly where cable transmission line is installed.
2	**Ambient Air Quality**	
	The potential problems that can arise is the dust emissions from the excavated material and Gaseous emissions from the construction equipment's/vehicles.	Fugitive dust emission from construction activities like excavation, trench foundations, backfilling or road leveling. Gaseous emission from the construction equipment's, power generators, moving equipment's and erection machinery. After removal of top soil and vegetation cover, soil does have to tend erosion and dispersive potential which is proportional to environmental risk.

Mitigation Measures	➢ Use dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust and during earthmoving activities, prior to clearing, excavating, backfilling, compacting and grading. ➢ Excavated material need to be disposed of away (which is not in use) from the construction area to prevent dust emission. ➢ Dust emissions from soil piles and aggregates storage stockpiles will be reduced by

	appropriate measures. These may include by sprinkling of water at appropriate frequency and erecting the windshield walls on the three sides of piles. ➢ Post and enforce speed limits to reduce airborne fugitive dust caused by vehicular traffic. ➢ Cover construction materials and stockpiled soils if they are a source of fugitive dust. ➢ Workers and drivers should wear dust masks and safety goggles during dry and windy weather conditions to avoid health risks.
3	**Noise pollution**

	The potential problems that can arise from the noise from the construction equipment/vehicles. Noise produces by transportation and erection of material as well as during construction and installation of cable.	➢ Material loading/unloading vehicles and other transport used by contractors. ➢ While construction noise can be unwelcomed during night time in residential areas when people are trying to sleep, sometimes it may be too loud, be impulsive, and interrupt people's activities. Contain annoying pure tones; occur unexpectedly and at undesirable times of day
Mitigation Measures		➢ If the right-of-way is in a residential area, construction hours and the amount of equipment operating simultaneously may need to be limited to reduce noise levels. ➢ Noise pollution due to construction works should be controlled by completing this task in a short period of time and also be confining it to day time hours. ➢ Use of noise barriers or noise canceling acoustic devices should be considered as

		necessary. ➢ Site labor working in high noise area such as where noise level exceeds limit, should wear earplugs. ➢ Blowing of horn by the project related vehicles should be strictly prohibited.
4.	**Ground water Contamination**	
	Sewage water line leakages/damage, grey water (used in construction) by project activities.	Sewage water leakages or sewage pipe damages during excavation work of trenches which can contaminate ground water quality.

Mitigation Measures		➢ In case of incidental leakages from sewage line, it is recommended that leakage line should be replaced to reduce the ground water contamination and leachate formation. Also use municipal tankers to collect water filled in excavated/trench area. ➢ Before any earth work consult with concerned department.
5	**Sewage Water Line**	
	Sewage water line leakages/damage, grey water (used in construction) by project activities.	➢ Sewage water leakages or sewage pipe damages during foundation excavation and grey water may contaminate water. Improper excavation may cause deteriorate water quality.
Mitigation Measures		➢ Before any excavation work take inform the concerned Departments. ➢ Excavation techniques should be efficient to avoid water utility damage ➢ Avoid any damage of sewage and other utilities which may cause water contamination

6	**Soil and Land Contamination**	
	Oil, lubricant chemical spillage, construction debris and damages of sewage line may cause land contamination.	Spillage of Oil, lubricant and spillage may cause soil contamination, slippery surface and Soil contaminated with over spill of sewage water by damaging sewage line.

Mitigation Measures		➢ The secondary containment facility should be available to avoid any spillage or fire hazard and material should be stock according to the inventory requirement. ➢ Construction debris should be collected and dispose of properly ➢ Avoid any damage to sewage and other utilities which may cause land and soil contamination
7	**Solid waste**	
	Lubricants and chemicals, construction debris and other waste installation material (metal, wooden, plastic & cable pieces, excavated (dredging) material and packaging material	Debris, vegetation, excavated soil, scraps metal from the equipment fabrication and waste from domestic nature from workers activities in construction camps may cause land contamination, slippery site surface and harm natural environment, excavated material with trench may slide on workers, choking of drains, etc.
Mitigation Measures		➢ Use waste minimization techniques to reduce, reuse & recycle waste material. ➢ Excavated materials should be segregated from other wastes to avoid contamination thereby ensuring acceptability for refilling and avoiding the need for disposal at

		landfill. ➢ Arrival of materials and products should be planned, according to designated place on site and to production requirement ➢ Raw material inventory records should be maintained and avoid excessive stocks. ➢ Stockpiles of sand, gravel, soil and other similar material should be managed properly so that they do not spread and cannot be washed in the adjacent drain/street ➢ Integrated waste management plan should be prepared to minimize a waste generation ➢ Hazardous waste should be stored in identified mark with air tight lid container. ➢ Waste disposal should be according to nature of the waste with approved EPA certified contractor.
8	**Ecological Impacts**	
	Underground Transmission Line & Grid Station Ecological disturbance from project activities.	No major vegetation clearing will be carried out during the excavation, foundation and line installation phase except for common vegetation which is also in negligible quantities. The plants species within the vicinity of the proposed site are of minor ecological importance. Possibility of marine birds to perch on the corners of shore is considered.
Mitigation Measures		➢ Construction techniques should be environment friendly to minimized local vegetation clearance of the project site. ➢ Clearance of vegetation to be kept minimum. ➢ Avoiding night construction whenever possible to minimize fauna disturbance. ➢ The trenches should be properly covered to avoid any incidents of livestock and other

		animals. ➢ Wild life should not be harmed from project activities ➢ Birds will not be affected as they will be relocating to adjacent suitable habitats.
9	**Health & Safety**	
	Incident may occur in case of improper management and work practices	Excavation way may interfere by numerous public utilities and service systems including water, sewer which may cause incidents and fire hazard by electrocution, fractures gas and dust emissions may harm far community, Structure collapse, accidents during transportation, handling, installation of high transmission line and land (excavated material sliding may cause serious injury).

Mitigation Measures	➢ Establish and maintain a safety and health program for the worksite ➢ Provide adequate systematic policies, procedures, practices ➢ Health and safety Impact assessment should be prepared before starting project activity to prevent hazards to workers or nearby community. ➢ Contractor should be aware of health hazards from project activities. ➢ Contact with concerned department before starting excavation ➢ Surface encumbrances that create hazards must be removed/supported ➢ Employees must be trained to operate heavy equipment ➢ Use barricades, hand or mechanical signals, stop logs to keep operators safe ➢ Barricades should be used at excavated site ➢ Appropriate PPEs should be providing to workers.

		➢ Safety sign boards should be placed for construction work and traffic safety purpose at project site. ➢ Preliminary safety precautions should be taken before earth work ➢ Workers are prohibited from entering excavation sites with accumulated water unless adequate protection has been provided ➢ Keep surface materials at least 2 feet away from the edge of excavation sites. ➢ Understand the minimum approach distances outlined for specific live line voltages ➢ Ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system ➢ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents, changing the location of conductors, and / or using raptor hoods ➢ The worker is properly isolated and insulated from any other conductive object (live line work).
10	**Traffic**	
	Traffic flow in the project vicinity slightly increase during the project activities of project construction.	Construction proposed activities would temporarily affect transportation facilities within the project area. Construction is likely to cause temporary traffic delays.

Mitigation measures		o During construction stage, the contractor should organize detailed temporary traffic management schemes using updated traffic counts and on-site trial runs for the works. o Use temporary traffic management schemes to be approved by the relevant authorities prior to its implementation. o Heavy equipment should be transported in the early morning. o Vehicles will be maintained regularly to reduce emissions.
11	**Social impacts**	
	Incidents by opening the trenches or by the construction vehicular movements	Visual and auditory disturbance due to the presence of machinery, construction workers and associated equipment
Mitigation measures		➢ People to be informed about the construction activities and surveys. ➢ Impacted people to be given Preference for local employment as labor. ➢ Compensation to be paid on time and based on the prevailing market rates. ➢ Community should involve during all project activities. ➢ Contractor should inform before any earth work to residents of project sites. ➢ Incidents should be avoided and construction vehicles should be placed at designated areas to avoid any incident.
12	**Geo Hazards Earthquake**	

	Grid Station Could cause any Towers to fall.	Limited potential for harm unless people were very close to the line.

Mitigation measures		➢ Maintenance of 30-meter buffer zone for houses. ➢ Foundation/maintenance should be inspected periodically. ➢ Emergency system should be efficient in working condition
13	**Meteorological impacts**	
	Equipment's and construction structure caused by heavy rainfall, flooding & wind storms.	Excavated material in wind storms may harm the environment. Improper back filling may cause serious incidents in rainy season Rainfall may affect the construction work. Heavy rain has tendency to collapse foundation or trench structure.
Mitigation measures		➢ Safety measures should be efficient in case of any natural hazards. ➢ Prohibit the construction work during heavy rainfall, flooding and windstorms.
POST DEVELOPMENT PHASE		
1	**Meteorological impacts**	

	Equipment's and construction structure caused by heavy rainfall, flooding & wind storms.	➢ Damage lines may fall on the residents which may cause any serious conditions. ➢ Improper back filling may cause serious incidents in rainy season ➢ Heavy rain has tendency to collapse foundation or trench structure. ➢ These hazards may work as a medium between ground objects and energized conductors. This may cause any serious incident.
Mitigation Measures		➢ Safety measures should be efficient in case of any natural hazards. ➢ Prohibit the maintenance work during heavy rainfall, flooding and windstorms.
3	**Electric and Magnetic field**	

	Underground Transmission Line & Grid Stations there is public and scientific concern over the potential health effects associated with exposure to EMF.	There is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern

Mitigation Measure	➢ Identification of potential exposure levels in the workplace, including surveys of exposure levels in new projects and the use of personal monitors during working activities. ➢ Training of workers in the identification of occupational EMF levels and hazards. ➢ Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers. ➢ Considering sitting new facilities so as to avoid or minimize exposure to the public. Installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g. schools or offices), should be avoided. ➢ EMF can be reduced by Shielding with specific metal alloys, increase depth of cables and modifications to size, spacing, and configuration of conductors ➢ Since Pakistan does not have PEQS for EMF levels, it is suggested to follow international standards of WHO, IFC etc.
4	**Oil Spillage**

	Transformer oil spillage can occur during operation due to leakage or accident.	Contamination of land and soil of the facility Leaching into water bodies located nearby grid station

Mitigation Measure		➢ Substation transformers will be located within secure and impervious areas with a storage capacity of 100% spare oil. ➢ Proper drainage facilities will be constructed to avoid overflow or contamination with natural flow paths.
5	**Health and Safety**	
	Grid Station Towers or bays Incident may occur in case of improper management and work practices	Towers or bays may interfere by numerous public utilities, fire hazard by electrocution and Structure collapse maintenance of high transmission line.
Mitigation Measure		➢ Establish and maintain a safety and health program for the worksite ➢ Provide adequate systematic policies, procedures, practices ➢ Health and safety Impact assessment should be prepared before starting project activity to prevent any incident hazards to workers or nearby community. ➢ Contractor should be aware of health hazards from project activities. ➢ Employees must be trained before working with heavy voltage lines during maintenance. ➢ Use barricades, hand or mechanical signals, illuminants painted towers for traffic safety in night hours, stop logs to keep operators safe ➢ Appropriate PPEs should be providing to workers during maintenance work.

	➢ Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others. ➢ Understand the minimum approach distances outlined for specific live line voltages ➢ Ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system ➢ The worker is properly isolated and insulated from any other conductive object (live line work).

ENVIRONMENTAL MANAGEMENT PLAN

Aspect	Impact	Mitigation	Monitoring parameters	Location	Monitoring	Frequency monitoring	Responsibility
Construction phase							
Air	Chronic health affects Reduced visibility on roads	Sprinkling of water Tuning of construction vehicles & machines Dust masks for laborers	Particulate Ma Smoke CO, Sox	All project locations	Vehicular emissions Dust Ambient air quality	Monthly for emissions and daily for dust	HSE Manager/ Proponent
Noise	Stress Hypertension Hearing loss Headache	Avoid working at night Lubrication of construction vehicles Ear plugs	Noise levels	Project location close to residential areas	Noise monitoring device		HSE Manager/ Proponent
Land & Soil	Erosion due to excavation Formation of pits due to improper backfilling	Proper backfilling and stone pitching around the excavated site if required	Surface topography	All project locations	Visual assessment Photographic evidences	From beginning till completion of project	HSE Manager/ Proponent
Vegetation	Cutting of trees	Avoid unnecessary cutting of trees In case of cutting of trees, one plant should be replaced by 6 plants	No oftrees cleared cut of Disposal cho trees Ensure replantation ratio of same by	All project locations	Visual assessment Photographic evidences	From beginning till operational phase	HSE Manager/ Proponent

			species				
Water	Wastage and misuse of water	Avoid un necessary use of water Prevent leakages	Water supply and use	All project locations	All project locations	From beginning till the end of project	HSE Manager/ Proponent
Construction debris	Formation of heaps Remaining concrete material results in hardening of ground surface	Avoid wastage of concrete material Reuse remaining construction material	Quantity & quality of construction material	All trenching areas	Visual assessment Photographic evidence	Weekly	HSE Manager/ Proponent
Social Environment	Disturbance to routine market and local business activities Conflicts between laborers and local communities	Specify time scale for construction activities Discussion with local people regarding conflicts if any	Maintenance of complaint register	All project locations	Review of complaint register Local consultations	Monthly	HSE Manager/ Proponent
Roads and networks	Traffic congestion Night time visibility of drivers is reduced	Diversion routes must be allocated to maintain traffic flow Signs and reflectors must be boarded for driver's visibility	Signs and detours are being followed	Intersections of diversions	Observations Local residents consultations and log book	Weekly	HSE Manager/ Proponent

Health and safety	Lack of awareness to general public about safety may lead to accidents Incompetent and untrained workers might cause harm	Safety symbols and instructions will be boarded at work sites Trained personnel will be appointed for the specific work	Safety precautions	On all project sites	Tool box talk Visual assessments Record of PPEs	Daily	HSE Manager/ Proponent
	to themselves and others. Construction works may include many risks and hazards that may lead to injuries or even death	Appropriate PPEs must be used for technical work	Use of PPEs				
Operational Phase							
Electric Magnetic Field (EMF)	Human health impacts such as, neuropsychological disorders or cardiovascular diseases	Increase depth of cables to suppress the EMF levels Appropriate cabling with protective shields to suppress electron flux	EMF Intensity	Residency units near the corridor and grids	Electromagnetic meter	Biannually	HSE Manager/ Proponent
Transformer oil spillage	Contamination of soil and water bodies	Regular checking of storage tanks and machines	Soil sampling for oil and grease	Grid station	Visual assessment Soil analysis Equipment maintenance record	Bi annually	HSE Manager/ Proponent

CHAPTER # 8

CONCLUSION AND RECOMMENDATIONS

Based on the study conducted for Environment Impact Assessment (EIA) for the subject project, the following conclusions are made:

The EIA of the proposed transmission network project has achieved the following goals:

- Identification of national environmental regulatory requirements that apply to the proposed project activities;
- Identification of the environmental features of the project area including the physical
- , biological and social disturbance and likely impact of the project on the environment; o Recommendation of appropriate mitigation measures that Management of M/S Panther Tyres Limited will incorporate and ensure as per this EIA into the project to minimize the adverse environmental impacts.

Baseline physical, biological and socio-economic and cultural data and information was collected from a variety of primary and secondary sources, including field surveys, review of relevant literature and online publications. The collected data was used to organize profiles of the physical, biological and socio-economic environments, likely to be affected by the project. Communities were consulted as per public consultation processes including women, men and institutional stakeholders. The aim of public consultation was to assure the quality, comprehensiveness and effectiveness of the EIA; as well as to ensure that the views and opinions of the local people were adequately taken into account in the decision-making process.

Further an Environmental Impact Assessment Report was made to highlight the potential impacts of the described project on the area's physical, biological and socio-economic, gender and cultural environments.

It is concluded that the potential impacts of the proposed project (Grid addition) will be insignificant on most of the environmental receptors, provided that the EMP and its mitigation measures proposed in this report are implemented in true spirit. However, some

area will need special care with regards to the disturbance to the community of the area. Management of M/S Panther Tyres Limited Develop must be constituted to ensure minimum impacts.

8.2 Recommendations

- In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.
- Tree plantation inside the unit and near the unit is recommended.
- The untreated wastewater will not be reused for irrigating the vegetation and lawns.
- High standards of bio-security and safety will be enforced during operation stage. Safety of the workers will be top priority for the management.
- The Management of y M/S Panther Tyres Limited Developers will continue to assist the local communities as a corporate/social responsibility.
- The present EIA report is enough to meet the administrative and legal framework. Therefore, the environmental approval may be accorded for the present project.