

ENVIRONMENTAL IMPACT ASSESSMENT

M/S ASHIQ MUHAMMAD & SONS (PVT.) LIMITED

Mouza Alipur Tehsil Jalalpur Peer Wala, District Multan

September 2023



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EXECUTIVE SUMMARY

The proposed project is a gas storage and distribution terminal to be established by the project proponent which will store LPG gas prior its distribution in storage tanks in different parts of the country for regional supply as per demand. The project will be LPG Storage and Filling Plant under the title of **"M/s ASHIQ MUHAMMAD & SONS PRIVATE LIMITED"** to be located at Khewat No. 1097, Khatooni No. 1097 to 1098, Khasra No. 9, 10, 11, 12, 19 & 20, Mouza Alipur, Tehsil Jalalpur Peerwala, District Multan.

The proposed project for the commissioning of its objective and construction requires fulfilling the legal requirements of the Punjab Environmental Protection Act-1997, Section 12, for which this Environmental Impact Assessment (EIA) report is being submitted.

NAME OF PROPONENT

Name : Muhammad Zawar S/o Ashiq Muhammad
CNIC No. : **36301-8032763-1**
Address : Mouza Ghazipur Bahalli, Tehsil Jalalpur Peerwala, District Multan

THE CONSULTANT

CHEMSA as independent environmental consultants, has been appointed by the proponent to conduct Environmental Impact Assessment (EIA). Company office address is House No. 76, Gulshan-e-Sardar Housing Colony, MA Jinnah Road, Multan Contact # 0305-6763158 & 0331-6763158, email address chemsa001@gmail.com

PROJECT'S SALIENT FEATURES

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

Title	M/s Ashiq Muhammad & Sons Private Limited
Location	Mouza Alipur, Tehsil Jalalpur Pirwala, District Multan
Google coordinates	29.549781, 71.234892
Total Cost	Rs. 46.2-Million
Project area	29-Kanal 15-Marla
Electricity Requirements	400-KVa
Standby Power Generator	100-KVa
Process	Storage of Gas for regional supply
Storage Capacity	LPG = 200 MT

BRIEF OUTLINE OF PROJECT

The project is to be located at Mouza Alipur, Tehsil Jalalpur Peerwala, District Multan. The project in its vicinity has infrastructure like roads, transport, electricity, telephone, land and even the environment is of ideal condition for establishment of LPG Storage & Filling Plant.

ENERGY AND WATER AVAILABILITY

The electricity supply is the usual 400-KVa supply from local electricity board that is WAPDA. In order to meet the emergency as well as critical power requirements during WAPDA shut down the project also have a supportive facility for standby power generation. The water requirements of the facility will be fulfilled by extracting water from soil by bore wells, for all the construction and operational activities.

PROJECT IMPACTS AND RECOMMENDATIONS FOR THEIR MITIGATION

The table given below shows the project impacts; related with construction and operation of the Project. Accordingly, mitigation measures have also been proposed to manage the environment and for sustainable development.

Table 1: Project impacts and mitigation measures

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
CONSTRUCTION PHASE		
Dust emissions likely to occur during the excavation of the top soil and loading and transportation of the construction waste.	Minor / Short term	• Watering all active construction areas when necessary. • Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of free board. Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites. • Provision of PPEs to workers
Hydrology and water quality degradation.	Minor / Short term	• Installation of the septic tank. • The proponent will prepare a hazardous substance control systems and emergency response plans that will include preparations for quick and safe clean-up of accidental spills.
Oil spills from machines to be used on site and vehicles.	Minor / Short term	The contractor will control the dangers of oil spills during construction by maintaining the machinery in specific areas designed for this purpose hence will not be a serious impact as a result of the construction.

Noise pollution due to the moving machines (mixers, tippers, communicating workers) and incoming vehicles	Minor / Short term	• Install portable barriers to shield compressors and other small stationary equipment where necessary. • Limit pickup trucks and other small equipment, observe a common-sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible.
Worker's accidents and hazards during construction.	Minor / Long term but reversible	• Provision of appropriate and adequate Personal Protective Equipment (PPE) to employees. • Enforcement and proper use of PPE by all construction workers. • Provision of appropriate tools, equipment, and machinery in sound working conditions to employees.
OPERATION PHASE		
Municipal Solid Waste production during the operational activities.	Major/ Long term	• Municipal Solid Wastes generated from residences will be disposed of properly to avoid any threat to the environment. • The contractors to whom any waste recyclable material is to be sold shall be fully made aware of the environmental impacts and health effects of the waste to be sold to him if there is any.
Noise will be generated from the standby generator.	Minor/ Long term	• Proper covering of standby generator, to reduce the noise. • Noise reduction measures like buffering of noise through trees should be adopted where deemed necessary to reduce the noise level at the project boundary.
Air Emissions will be generated from standby power generator	Minor / Long term	HVAC equipment's will help cleaning the air that can be potential source of air emissions.
Disruption of water quality due to mixing of oils, grease, and lubricants during	Minor / Short term	• Water quality monitoring should be carried out at the site. • Parameters to be monitored at all locations should include the same as prescribed by the PEQS. • Installation of septic tanks

operations and indiscriminate disposal of sewage water		
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PROPOSED MONITORING

The monitoring program is designed to ensure that the requirements of the environmental approval awarded by the EPA are met. Monitoring Program (MP) provides important information that allows for more effective planning and an adaptive response based on the assessment of the effectiveness of mitigation measures. The monitoring of various parameters will help to determine the extent to which project construction/operation activities will cause an environmental disturbance.

Table 2: Environmental Monitoring Plan

Environmental segment/element	Monitoring parameters	Reference location/monitoring Point	Monitoring frequency
CONSTRUCTION PHASE			
Water Quality	As prescribed by the Punjab environmental Drinking Water Quality Standards	Main Drinking Water Source	Quarterly
Ambient air emissions	SPM, SO _x , NO _x , CO	Use of generators, movement of materials, digging or excavation.	Quarterly
Waste water including Sewage	Ensure that all wastewater will be treated to the level set by the PEQS-Punjab.	sewage or sanitary wastewater of the campsite and usage in other construction activities.	Quarterly
Noise	The Levels prescribed as in Punjab Environmental Quality Standards	The noise produced by the machinery during construction work.	Quarterly
Solid Waste Disposal	Ensure that all wastes are disposed of according to legal requirements of the country.	The waste material, rubble and solid waste produced by the camp site	Quarterly
OPERATIONAL PHASE			

Water Quality	As prescribed by the Punjab Environmental Drinking Water Quality Standards	Main Drinking Water Source	Quarterly
Ambient air emissions	Carbon Dioxide, PM, CO, O ₃	Generator Area	Quarterly
Waste water including Sewage	Ensure that all wastewater is treated to the level set by the PEQS - Punjab	Main Disposal Site	Quarterly
Noise	Noise levels	Generator and parking area	Quarterly
Solid Waste Disposal	Ensure that all wastes are disposed of according to legal requirements of the country.	Municipal solid waste/ storage area	Regularly in terms of environmental and safety rounds.

Table 3: Environmental management cost

Environmental Component	Quantity	Approximate Cost (PKR)
(i) Tree Plantation	1000	200,000.00
(ii) Health and Safety Measures and Provision of PPEs	L.S.	100,000.00
(iii) Environmental Monitoring Reports	04	200,000.00
Total Environmental Management and Monitoring Cost		500,000.00

STAKEHOLDER CONSULTATIONS

Public discussions were held with the inhabitants of the surrounding area. They are quite positive about the project and see the project as growing the business and accomplishing positive development in the area at local and in the country as a whole. The people observe strong positive impacts regarding employment, business and structural development due to this project. IEE findings depict that people perceive overall positive social and economic impacts by the project. Their attitude towards the project installation is highly optimistic. Majority of the people are convinced for development in the area and they correlate this progress with the pace of their social mobility.

CONCLUSION AND RECOMMENDATION

The report provides a conclusion based on the impacts assessed and mitigation measures suggested. The report recommends that EMP will be made a part of all contract documents. The design of the scheme should meet the PEQS parameters in all aspects. The contractor will be bound to completely implement relevant mitigation measures set out in the EMP during construction phase while during regular operation of the project. The proponent will be responsible to ensure all

the compliance of PEQS. If there are any changes in the design/ layout, or any other changes in project description then changes should be carried out through amendments in the environmental assessment report and EMP of the IEE.

SECTION-1

SCREENING

The proposed project is bulk LPG storage terminal to be established by M/s Ashiq Muhammad & Sons Private Limited. The company will store LPG (Gas) prior to distribution in storage tanks. The project under the name of **"M/S Ashiq Muhammad & Sons Private Limited"** to be situated at Mouza Alipur, Tehsil Jalalpur Peerwala, District Multan. The total cost of the proposed project is PKR Rs. 46.2-Million.

Screening was performed at the first stage of the IEE process which resulted in a key IEE decision, namely to either conduct the assessment (based on the likely significant impacts) or not conduct it (in the anticipated absence of such impacts). Screening was done as early as possible in the development of the proposal in order for the proponent and other stakeholders to be aware of possible IEE obligations.

The standardized approach i.e. defined in applicable regulations was applied. The proposed project was assessed based upon a set of criteria determined by Environmental Protection Department (EPD) i.e. Review of IEE/EIA Regulations, 2022 were considered for the purpose of screening mainly.

In compliance with the Environmental Protection Agency, Punjab, requirement an Environmental Impact Assessment (EIA) study in respect of the proposed project is submitted under Review of IEE/IEE Regulations, 2022. Moreover, following factors were also considered at the earlier stage:

- Magnitude of change in environmental conditions
- Diversity of new features with the existing environment
- Potential for trans-boundary or over large area impact
- Likelihood of effecting receptors of other types (fauna and flora, businesses, facilities) be affected?
- Probability of affecting valuable or scarce features or resources
- Risk of breached environmental standards
- Risk of affected protected sites, areas, features
- High/low probability of the effect occurring
- Long/short duration of effect
- Either effect is permanent or temporary
- Is the impact continuous rather than intermittent?
- If it is intermittent, will it be frequent rather than rare
- Reversibility of impacts
- The likelihoods to avoid, or reduce or repair or compensate for the effect

After detailed analysis on the basis of these factors; Environmental Impact Assessment (EIA) Study of the proposed project is submitted.

SECTION-2

INTRODUCTION

This Section of the report provides an overview of the rational of the Project, objective of project, requirement of the project, purpose of the report and approach adopted to conduct the Environmental Impact Assessment (EIA) study for a project involved in installing a gas storage and distribution facility. The project will be located at Mouza Alipur, Tehsil Jalalpur Peerwala, District Multan. Environmental Impact Assessment (EIA) study is submitted for fulfilling the legal requirements of Section-12 of the Punjab Environmental Protection Act-1997.

2.1 Purpose of Report

The report has been prepared in order to obtain Environmental Approval of the proposed project LPG storage and distribution facility of **M/s Ashiq Muhammad & Sons Private Limited**. As per EPA requirement filling of an EIA is required for the said projects. Hence EIA is submitted accordingly.

This report provides detailed basic information and facts of project; including especially among others environmental, economic, social, etc., enabling its assessment and justification that the project will meet the requirements of environmentally sustainable practices; both during installation and regular operation stages; as desired under the Punjab Environmental Protection Act – 1997, the Punjab Environment Quality Standards and the rules and the regulations thereof. 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 sectoral guidelines

Different environmental aspects like social, physical and biological etc. and other related features of the project both during installation and its regular occupancy are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision-makers, EPA Punjab in the present case, before issuing the desired Environmental Approval (EA).

2.2 Identification of Project

In accordance with the Punjab Environmental Protection Act - 1997, the project falls under Schedule I (List of projects requiring an IEE), Category B (Energy), (Oil and gas transmission systems) of Review of IEE/IEE Regulations, 2022. As per EPA requirement filling of an EIA is required for the projects involved in storage and distribution of LPG. Hence EIA is submitted for getting Environmental Approval under Section 12 of the Act *ibid*.

2.3 Identification of the Proponent

Name Muhammad Zawar S/o Ashiq Muhammad
CNIC No. 36301-8032763-1
Address Ghazipur Bahalli, Tehsil Jalalpur Peerwala, District Multan

2.4 Details of Consultant

CHEMSA as independent environmental consultants, has been appointed by the proponent to conduct EIA Study. Company office address is Ahmad Street, Gulistan-e-Ali, near Model Town Chowk, Multan. **Con# 0305-6763158 & 0331-6763158** chemsa001@gmail.com

2.5 Objective of report

Objectives to conduct this EIA are as following:

- i. A legal binding in accordance to the Punjab Environmental Protection Act – 1997.
- ii. To identify the potential environmental issues pertaining to the proposed site.
- iii. To evaluate the ability of the site by keeping in view the social acceptance and environmental soundness.
- iv. Providing maximum information to the proponent and other stakeholders, regarding existing environmental conditions and the implications of the proposed project.
- v. Collection of available data, reports, drawings and other relevant information about the proposed project.
- vi. Review of applicable existing environmental legislation and Punjab environmental quality standards (PEQS).
- vii. Propose mitigation measures to eliminate or to reduce the negative impacts to an acceptable level.
- viii. Development of well-resourced environmental management and monitoring plans to identify mitigation strategies targeted towards avoidance, minimization, and rehabilitation of the impacts.

2.6 Extent of the Study

In compliance with PEPA-1997 requirements, an EIA report has been prepared and submitted by the proponent. This document covers all environmental impacts, due to the proposed project, in and around the project area comprising the physical, ecological and socio-economic aspects together with identification of the potential positive and negative impacts. Any developmental activities outside the project area and establishment of the other factories outside the project vicinity have not been covered under this study.

2.7 Methodology

The methodology adopted to carry out the EIA study of the proposed project was as follow:

- a) Orientation

- b) Planning of Data Collection
- c) Data Collection
- d) Site Reconnaissance Surveys
- e) Analysis of Maps and Plots
- f) Literature Review
- g) Public Consultations
- h) Field Studies/visits
- i) Laboratory Analysis
- j) Evaluation of Impacts and their analysis
- k) Categorization of impacts based on their potential environmental significance and prescription of preventive / mitigation measures.

In addition to the evaluation and review of the available records, data and the facts for the previous project, detailed discussions were held with the concerned members of the project management as well as other project stakeholders. Notes and proposals for measures to be taken in order to mitigate and compensate for any determined/detrimental environmental impacts are contained in the Environmental Management Plan (EMP) as well as a Monitoring Plan, including all parameters that need to be measured, and the frequency of monitoring actions.

A comprehensive qualitative and quantitative methodology was adopted to conduct this study inter-alia in due compliance with the EIA requirements. The study included a collection of both primary and secondary data regarding environmental status and other relevant factors. This report has been accomplished after carrying out thorough visit to the proposed site and detailed investigation to identify the following Environmental areas of concern:

- 1) To achieve the desired environmental compliance standards; as per the national environmental regulatory requirements; as applicable to the project.
- 2) Plans and activities to prevent/mitigate any potential impacts and the gaps that could probably remain after implementation.
- 3) Any other points/steps to be taken which could be beneficial to mitigate environmental adverse impacts that may accrue both during construction and regular operation of the project.

Table 2.1: Environmental Process Assessment

Phase	Activities	Status	Responsibility
Screening and Scoping	Reconnaissance and initial site visit and consultations, identification of environmental and social issues & applicable safeguard environment policy, categorization and working out an action plan.	Carried out during the present EIA	Proponent
Impact Assessment	Identification of potential environmental and social impacts through site visits, stakeholders' consultations, review of drawings, alternatives etc.	Carried out during the present EIA	Proponent
Impact categorization	The significant potential impacts were tabulated and mitigation/preventive measures were prescribed	Carried out during the present EIA	Proponent
EMP Preparation	Stakeholders/Women consultation	Carried out /prepared as part of the present EIA	Proponent
	EMP		
	Social Framework Agreement (SFA)		
Final EMP	Final version of EMP produced	Included in the present EIA	Proponent

2.8 The report structure

This IEE document is structured as follow:

- Section–1: Screening of the Project:** Containing information in which schedule project falls
- Section–2 Introduction:** Containing general information about the project and process of carrying out the study.
- Section–3: Description of the Project:** Describes an overall detail of the works to be done.
- Section-4: Environmental Baseline Profile:** Gives information on Physical, Biological and Social conditions collected through a survey of the Project Area.
- Section–5: Screening of Environmental Impacts and Mitigation Measures:** Identifies various environmental impacts and their preventive actions. This makes the basis of the Environment Management Plan.
- Section–6: Environmental Management and Monitoring Program:** Contains comprehensive prescriptions regarding environmental

impacts and their mitigation measures. This also includes institutional arrangements and Environmental Management & Monitoring Plan.

Section–7: Stakeholders Consultations: Explains the process of public consultation and disclosure of the project in related stakeholder. It makes this document a legal public document.

Section–8: Conclusion and Recommendation: Concludes the IEE report with some practical recommendation

SECTION-3

DESCRIPTION OF THE PROJECT

3.1 Type and Category of Project

The project is gas storage facility in nature. In accordance with the Punjab Environmental Protection Act - 1997, the project falls Schedule I (List of projects requiring an IEE), Category B (Energy), (Oil and gas transmission systems) of Review of IEE/IEE Regulations, 2022, for which Initial Environmental Examination (IEE) report is required for Environmental Approval. However, EPA requires submission of an EIA for a project involved in storage and distribution of LPG. Therefore, to fulfill the legal requirements of the Section-12 of the Punjab Environment Protection Act-1997, the client is required to submit EIA report in the Environmental Protection Agency, Government of the Punjab, in order to obtain the required Environmental Approval (EA).

3.2 Objectives of Project

The proposed project is the bulk gas storage terminal in favour of M/s Ashiq Muhammad & Sons Private Limited will store LPG prior its distribution in storage tanks for regional supply. The proposed project will also contribute to the development and economic growth after its construction.

3.3 Alternatives considered and reasons for their rejection

The proposed project is gas storage and filling plant which will store LPG and distribute in cylinders. To fulfill the industrial aspects of the project under the reference of this EIA Report, it is to be sited at a place having commercial processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act-1997. Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, 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 opportunity of employment and others related facilities.

Keeping the aforementioned requirements in view, feasibility and other basic infrastructural requirements are available at the selected propose site.

3.4 Location Alternatives

The installation of the project is within commercial area of M/s Ashiq Muhammad & Sons Private Limited. There is no alternative of location of project as the proponent purchased the land at best financial proposal which will not hinder the project activities in future. Furthermore, there is access of roads to the proposed site which make it suitable for project installation. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997.

3.5 Cost and magnitude of operation

Total cost that has to be spending on the project is approximately Rs. 46.2-Million while total area for the proposed project is 29-Kanal and 15-Marla. The quantities have been worked out from the design drawings and project feasibility.

3.6 Location of the project

The project is located at Mouza Alipur, Tehsil Jalalpur Peerwala, District Multan. The project in its vicinity has infrastructure like roads, transport, electricity telephone, land and even the environment is ideal condition for the construction of a buildings (homes).

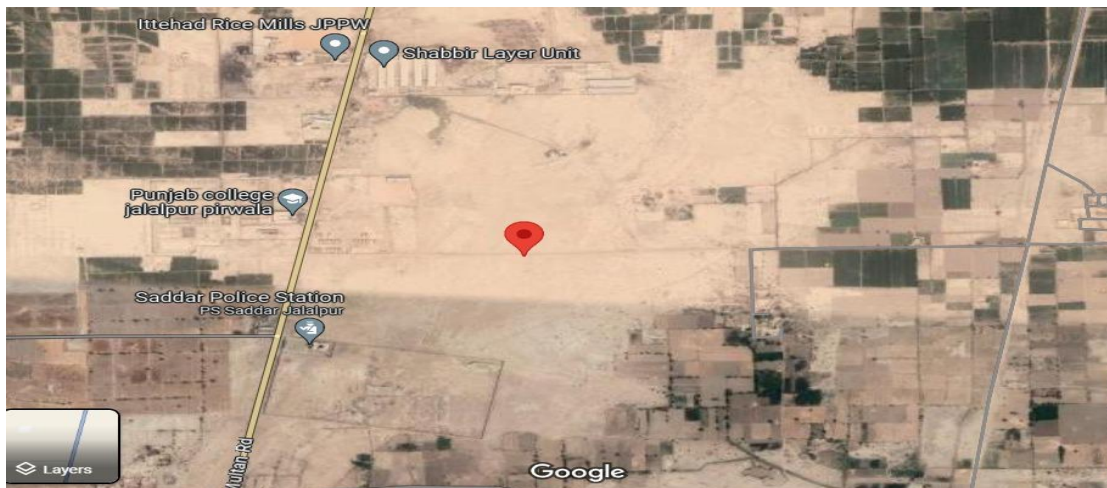


Figure 3.1: Google map of the Project (Site).

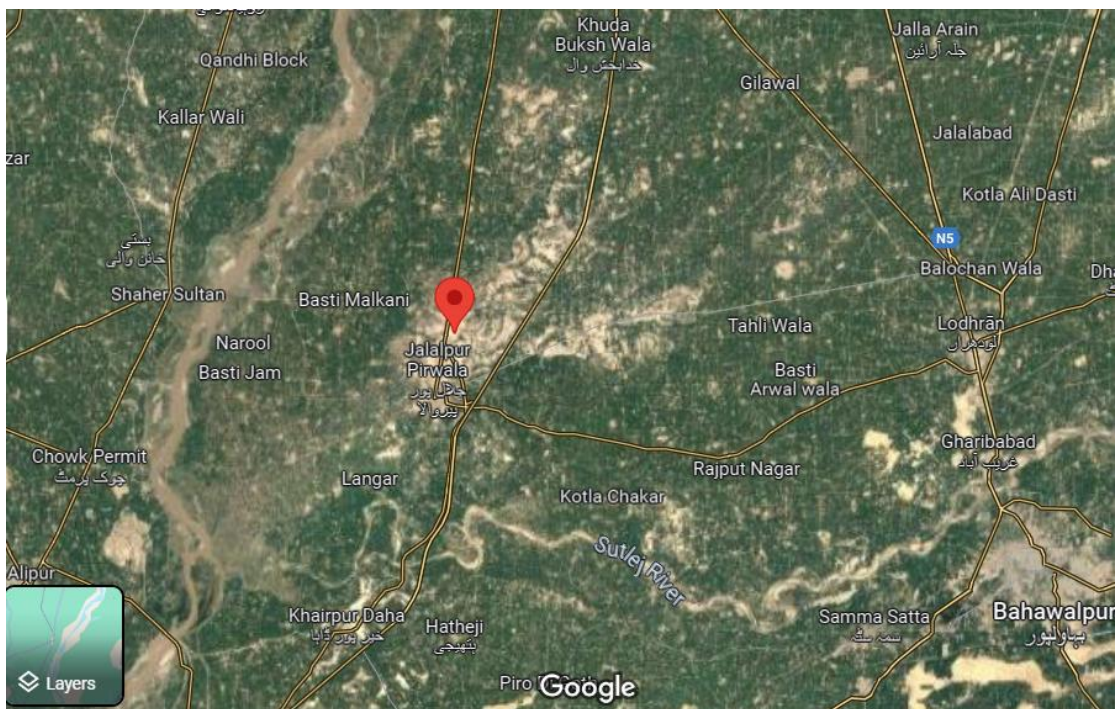


Figure 3.2: Google map of the Project (Areal View).

3.7 Area statement

The total area is 29-Kanal,15-Marla.

3.8 Land use

The land occupied for the construction is open barren land within agriculture zone.

3.9 Road Access

The project is accessible through Jalalpur Peerwala - Shujabad (Multan) Road. The access road to the project site is a 25 feet wide link Road off Chak No. 82 Road which is 22 feet and it is in good condition.

3.10 Construction period and cost

The project cost estimated about Rs. 46.2-Million has been developed in 2022. The quantities have been worked out from the design drawings. The rates for cost estimates are based on construction work, contractor cost, cost of land, and cost of the raw materials with 10% escalation for the year 2023. It is planned that the following schedule of project implementation will be adhered. This is subject to the conditions that everything goes according to planning and no serious bottlenecks are encountered. The implementation stages of the project activity include:

1st Stage

The stage –1 comprises the onsite contouring studies and soil investigations and the finalization of the project designs.

2nd Stage

The stage –2 comprises the following task:

- i. Laying of foundations excavation and commencement of erection work.
- ii. Shoring and piling
- iii. Start of civil, electrical and mechanical work.
- iv. Development of basic infrastructure.
- v. Fitting of instrumentation.

3rd Stage

The stage –3 comprises the following task:

- i. Residential building civil structure erection completion.
- ii. Completion of the basic infrastructures water supply system, electricity supply etc.

4th Stage

The last stage will be the commencement of regular use.

3.11 Energy use

The electricity supply is the 400KVa transformers. In order to meet the emergency as well as critical power requirements during power shut down the project also have a supportive facility for standby power generator with capacity of 100KVa.

3.12 Water use

The water requirements of the facility will be fulfilled by the extraction of ground water, for all the construction and operational activities.

3.13 Operational arrangements

At operation stage, the project proponent will be involved in operation and maintenance of the proposed facility.

3.14 Working equipment and utilities

The construction machinery and the utilities or equipment that is required in the operational phase which will be utilized for construction is shown in Tables below

Table 3.1: List of Construction Staff

Sr. No.	Category of Staff	Tentative Number
1	Engineer	1
2	Construction Manager	1
3	Planning Engineer	1
4	Material Engineer	1
5	Site Engineer	1
6	Supervisor	1
7	Foreman	1
8	Skilled Worker	10
9	Semi-Skilled Worker	20
10	Machinery Operator	1
11	Administration	2

Table 3.2: List of Construction Machinery to be used for Construction

Sr. No.	Type of Machinery	Quantity
1	Excavator	1
2	Dumper & Loader	1
3	Tractor & Trolley	2
4	Water Bowser	1
5	Lift/Crane	1
6	Generator	1
7	Concrete Pump	1
8	Water Pump	1
9	Welding Plant	1
10	Concrete Mixing Plant	1

3.15 General description of project

The project “**M/s Ashiq Muhammad & Sons Private Limited**” is located at Mouza Alipur, Tehsil Jalalpur Peerwala, District Multan. The project in its vicinity

has infrastructure like roads, transport, electricity, telephone, land and even the environment is of ideal condition for the installation of gas storage facility.



Figure 3.3: Process Flowchart

3.16 Restoration or rehabilitation plan of project

There will be no issue of rehabilitation will be involved as the proposed site is barren land owned by the proponent and his family member. The facility will be designed in such a way that there will be no rehabilitation. There will not be any kind of let off regarding safety factors as applicable from time to time for such project on all accounts.

Debris or any other wastes resulting from construction activities will be disposed of in environmentally sustainable fashion.

After completion; all construction matrix, debris, and garbage will be removed off immediately from the site within the minimum possible time under safe conditions. Any minor spillover of these materials will be cleared adequately. The land, if and where pitted will be adequately leveled. On the whole, the project site and the area in its near vicinity will be made neat and clean.

3.17 Government approval and leases required by the project

Water and Power Development Authority will be approached for sanctioning of the electricity supply. Layout plan will be got approved from Tehsil Council Jalalpur Peerwala soon after getting approvals from the concerned departments. EPA, Punjab has been approached for obtaining environmental approval according to the Section 12 of Punjab Environmental Protection Act-1997 which is the mandatory requirement of the project and basic document for according approval by the District administration.

SECTION-4

ENVIRONMENTAL BASELINE PROFILE

This section describes the baseline conditions, which cover the existing Physical, ecological and socio-economic environment of the project as well as study area. Data was collected by reviewing secondary data and field survey.

4.1 General

Description of the environmental settings (also referred to as "baseline", "existing", "background", or "affected environment") is an integral part of an environmental impact assessment and/or initial environmental examination. There are two major purposes of describing the environmental settings in an environmental study, namely:

- To ascertain and evaluate the existing environmental quality, as well as environmental impacts of the alternatives being studied, including the no-action or no-project alternatives, and
- To identify environmentally significant factors or geographical areas that could preclude the development of a given alternative or alternatives

Additional purposes of describing the baseline settings include, but are not limited provision of sufficient information so that the decision makers and the report reviewers, who might be unfamiliar with the general location, may develop an understanding of the project's needs and environmental characteristics of the area.

One of the significant environmental impacts of a development could be the likely changes in the land use profile. If implementation of a development involves massive conversion of agriculturally useful land into non-agricultural or otherwise less useful lands or leads to deterioration of the ecological environment by substantially altering the land use pattern in a manner, which is less favorable for propagation of agriculture, then the resultant impacts can be labelled as deleterious and harmful for the environment. Conversely, if a development project envisages very little or negligible changes in the existing land use scenario or the new land usage is of superior nature, then the development is regarded an environment friendly activity to the extent of this parameter.

It would not be out of context to mention here that usually the format of an IEE/EIA is either project specific or area specific or a combination of both. The baseline environmental conditions, therefore, have been described according to this format approach and contains a description of the baseline characteristics of the project area and the district, wherever relevant.

The Consultant's Professional Team in conjunction with the proponent and other concerned agencies undertook various studies and surveys relating to the project, such as: -

- Studies and investigations into the baseline environmental profile of the project area, where relevant

- Physical, geological, hydrological, and topographic environmental surveys of project area, where relevant
- Surveys about education profile and services in the area, where relevant
- Soil quality surveys and investigations, where relevant
- Socioeconomic surveys of the project area, where relevant
- Water quality investigations and analyses
- Ambient noise profile in the vicinity of the site
- Social surveys
- Surveys and interactive meetings with the neighbouring populations to know their understanding of the project and to solicit their specific concerns over the project, if any

The objectives of the social surveys were:

- Finding out impacts of the project on education, health, hygiene, lifestyle and social value system of the workers and inhabitants within the site's zone of influence
- Any probable dislocation of the persons and property and removal of encroachments, if any from project's construction, expansion or operation
- Assessing the prospects of employment and job opportunities and impacts on the economic portfolio of the beneficiary population of the project area ascertaining likelihood of cropping up of any social conflicts and sources of frictions with the neighboring community or the locals
- Finding out any sources of social and physical nuisances for the project or the local community

The above-mentioned studies included visits and physical surveys of the site and the nearby populations within a radius of 1 km from the site. The social surveys were carried out through random selection of the beneficiaries and the stakeholders. The nearby residents and the businesspersons, being the important stakeholders, were consulted in particular to solicit their views over various aspects of the project facility. Direct interviewing and soliciting the requisite information by asking short questions was found the best mode of eliciting the requisite information. The collective public gatherings were found another effective mode of procuring the requisite information.

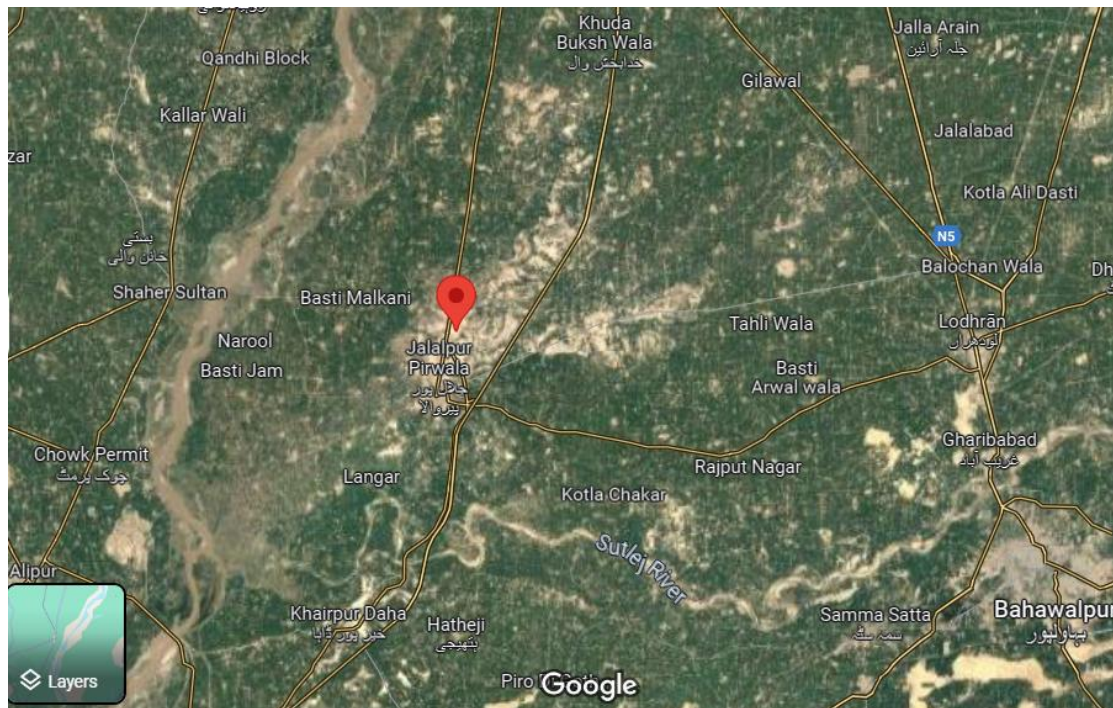
4.2 Physical environment

4.2.1 Geography and Geology

The soil of Multan is mostly alluvial. The alluvial deposits transported by the Chenab and Indus River and its tributaries have contributed soil characteristics very specific to a River Flood plain. Generally, the soil is silt clay in character and inclined to be dry. However, it is rich in potential nutrients and suitable for agriculture.

4.2.2 Topography

Multan is located in a bend created by five rivers of central Pakistan. It is built on a mound just east of the Chenab River. Multan District is surrounded by Khanewal to the North, Vehari to the East and Lodhran to the South. The Chenab River passes on its Western side, across which lies Muzaffargarh.



Fig

Figure 4.1: Topography of the Project Area

4.2.3 Climate

Weather of Multan is generally hot. The summer season starts in April and continues till September. Duration for the winter season is from November to March. The average maximum and minimum temperatures are 45°C and 3°C during the month June and January respectively. Rainfall is light to moderate during winter and high during the monsoons, which usually occurs in July and August. The maximum and minimum intensity of rainfall recorded is 210 and 42 mm in the month of July and April, respectively. Climate of the project site is mild where temperature during days remain slightly warm while the nights are cold during summer whereas winter experience even colder temperatures during day and night respectively.

The major part of the province of Punjab receives less than 250 mm of rainfall in a year. Southern Punjab receives less than 125 mm of rainfall and as such mostly falls in an Arid Zone. True humid conditions appear after the rainfall increases to 750 mm in plains and 625 mm in highlands. There are two sources of rainfall in Pakistan:

Monsoon and the Western Depression.

The earlier takes place from July to September and the latter during December to March.

*Rainfall in Multan is light to moderate during winter and high during the monsoons, which usually occurs in July and August. The maximum and minimum intensity of rainfall recorded is 210 and 42 mm in the month of July and April, respectively. Figure presents the map showing the precipitation regime of Pakistan.

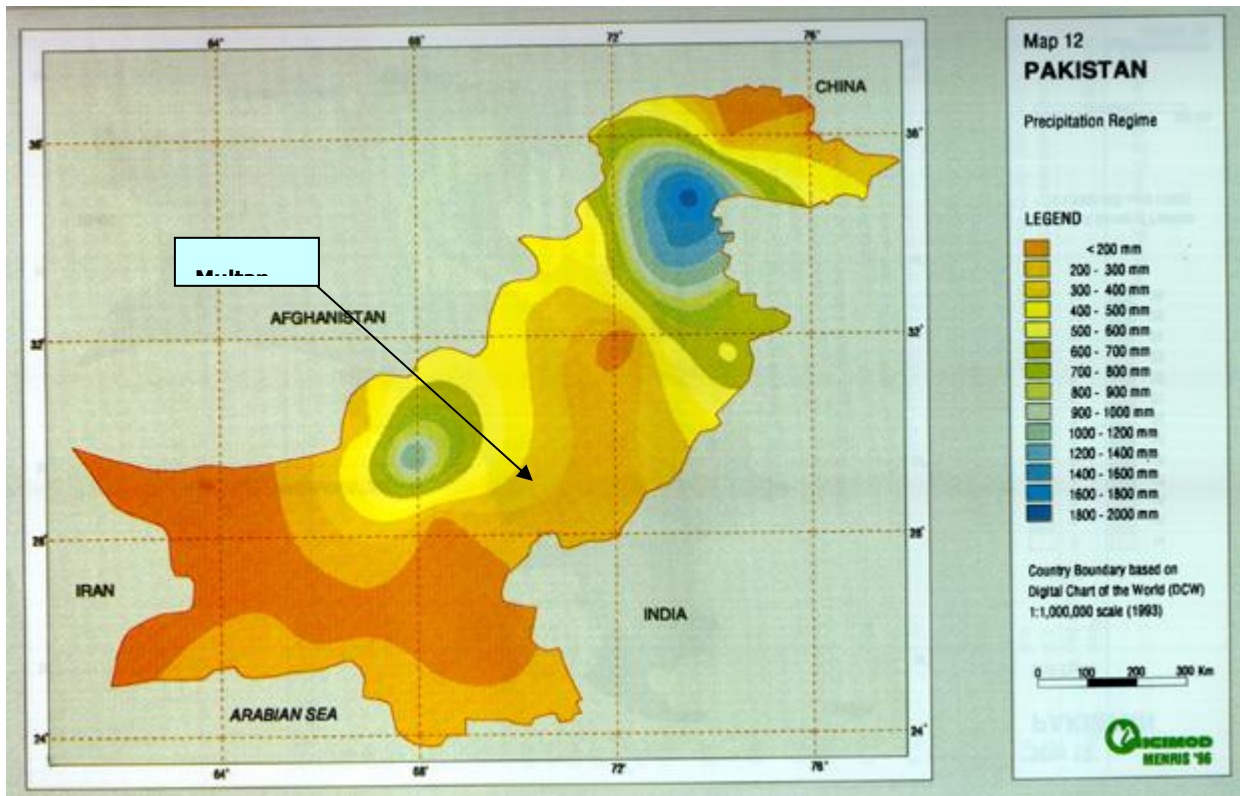


Figure 4.2: Precipitation Regime

Source: UNEP Environment Assessment Programme for Asia and the Pacific (<http://www.rrcap.unep.org>)

**Source: District Census Report of Multan*

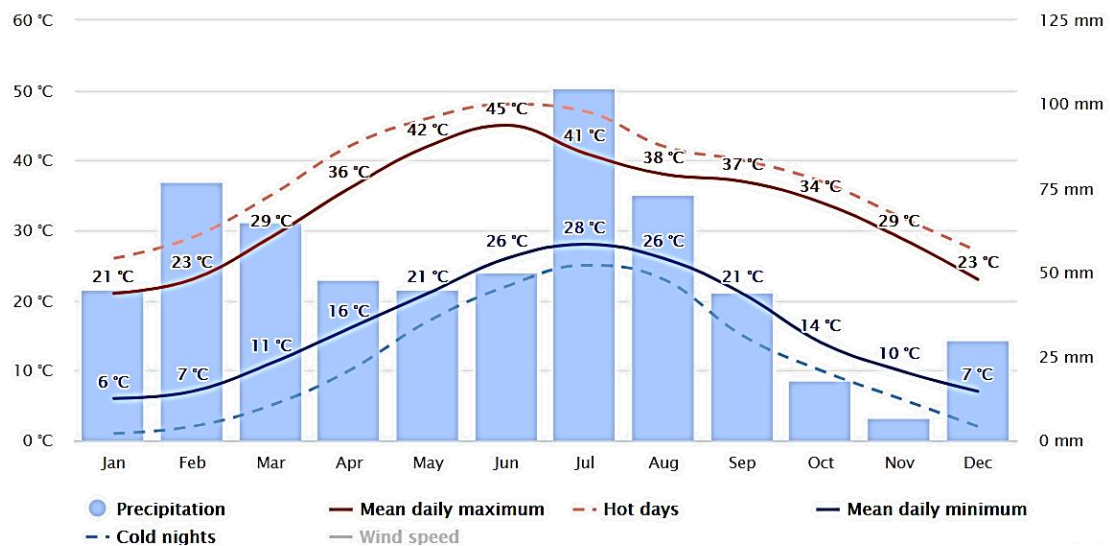


Figure 4.3: Average Annual Temperature and Precipitation

The average daily wind speed was highest in July which was 38 km/h. In recent years, the maximum sustained wind speed has reached 38 km/h. The diagram shows how many days within one month can be expected to reach certain wind

speeds. Monsoons create steady strong winds on the Tibetan Plateau from December to April, but calm winds from June to October.

The wind speed directly affects the dispersion and transport of plume. So, the greater is the wind speed, the greater will be the dispersion and the distance at which plume strikes the ground and the lesser will be the pollution concentration.

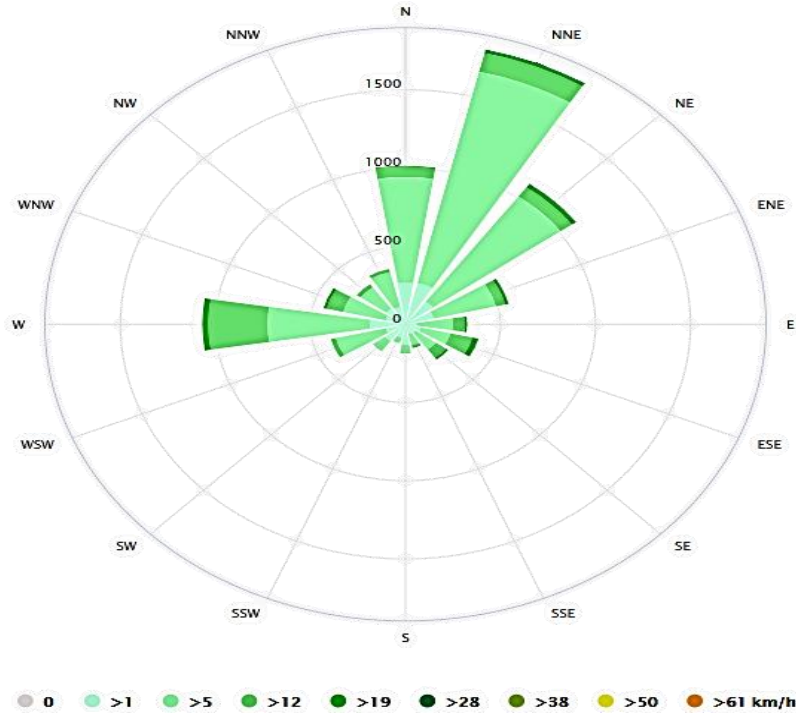


Figure 4.4: Average Wind Speed

4.2.4 Seismicity

According to Seismic Zoning of Pakistan, the project area lies in Zone 2A and represents minor to moderate damage due to earthquakes.

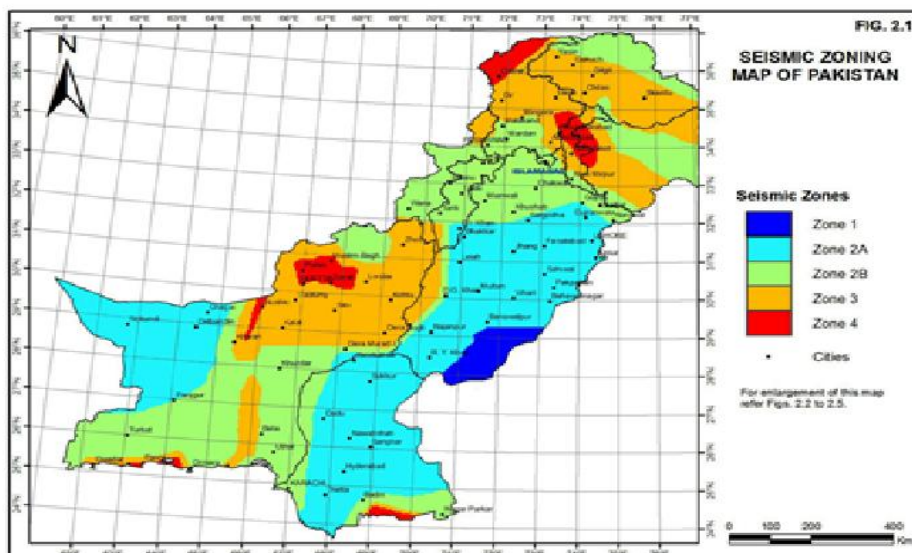


Figure 4.5: Seismic Zoning of Pakistan

4.3 Ecological Environment

Since the project site falls in agricultural area, hence the factors like ecological resources fisheries, aquatic biology, wildlife, forests, rare or endangered species are not applicable.

4.3.1 Water Resource

The main source of the water consumption is the ground water which is being pumped from 100 ft and its being used in the study area for domestic purposes. To check the quality of the water in the area, ground water was collected and analyzed. The ground water was collected from bore hole adjacent to the project area. The detail of the water quality of the project has been annexed with base line study report. The results of the groundwater analysis showed that all the parameters were within the limits as prescribed in WHO guidelines.

4.3.2 Ambient Air

The project site is surrounded by other industrial units. The major sources of air pollution in the area are surrounding industrial units and transportation or vehicular traffic. To record the baseline ambient air quality of the project area, monitoring was conducted at advised locations to assess the concentration of priority pollutants (Carbon monoxide, Nitrogen dioxide, Sulphur dioxide and PM₁₀) in the air. Detail of the ambient air and noise level quality of the project have been reported in base line study report.

4.4 Socio-Economic Environment

This section provides collective information about the existing socio-economic and environmental condition of the project area within the AOI. The different types of socio-economic aspects were covered such as demographic profile, occupation, education and health facilities. This data helped in identifying major interventions for the development of Environmental Management and Monitoring Plan (EMMP). The study also helped to assess the positive or adverse impacts on local community. The major occupation of the people in the study area is agriculture and the detail of crops, being sown in this specific area is given below:

4.4.1 Cultivated Crops

The main crops that are being cultivated in the study area includes; Rice, Wheat, Sugarcane, Onion, Tomato and Potatoes. The area is famous for best Basmati rice production in the world.

4.4.2 Livestock

People in the study area have common livestock which include; Cows, Buffalos, Sheep, Goats and Hens. However, there is no proper cattle or poultry farm observed within the study area.

4.4.3 Demographic Information of Study Area

The installation of gas storage facility will be located in the sparsely populated area at Jalalpur Peerwala, District Multan. The demographic features include the

information on population, family system and size, occupation, income and other social amenities available, etc.

The project site is 5-km away from Jalalpur Peerwala. During the survey of project area, socio-environmental team of CHEMSA Consultants visited nearby residential area which is in the closest to the project site.

4.4.4 Social and Public Amenities Available

The social and public amenities present in the area are given below:

a. Physical structures

There is no population living in the project area but the study area is semi populated. The land use on the project site is agricultural. The people in this area are deprived of basic facilities like health, proper sewerage and sanitation facility, medical facilities, provision of safe drinking water, etc.

b. Religious Structure

There a mosque located at 0.9-km from the project area. There is no shrine, structure or any other religious infrastructure present in the proposed project site that could be damaged and dislocated due to the proposed project establishment.

c. Protected Structures

There is no protected site, structure or any other social infrastructure present in the proposed project site.

d. Cultural Heritage and Community Structure

As stated earlier that the project area has no population and physical structure that may be damaged. CHEMSA Consultants' team also visited the study area but did not find any cultural heritage and community structure within the study area that could be impacted due to the proposed project.

4.5 Quality of Life Values

Socio-Economic Questionnaire and Environmental Checklist were used as survey tools by the IES survey team to collect desired information. Graphical representation of results of Socio-Economic Survey is given below:

4.5.1 Occupation of Respondents

Majority of the respondents (20%) belongs to the labor class, 33% have their own business, 13% daily wagers, 13% attached with agriculture, 7% shopkeepers and remaining 7% are private employees. During survey, efforts were made to interact with people representing all walks of life. The detailed graphic representation of occupational status is given below:

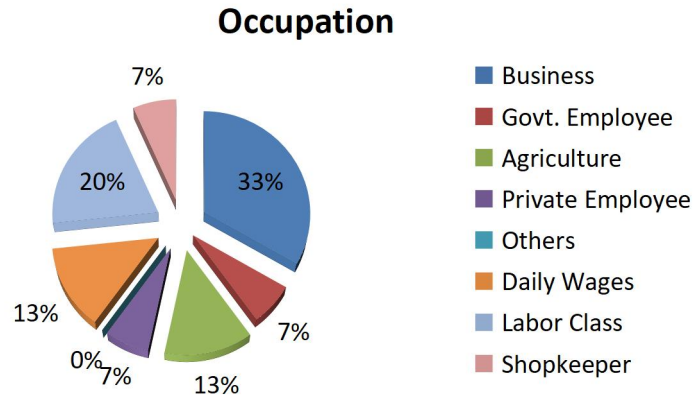


Figure 4.6: Occupation of Respondents

4.5.2 Personal Income

Based on the sample survey results, as the figure shows that nobody was earning less than 20,000 rupees, 69% of respondents fall within the income range of 20,000 – 25,000, 23% respondents earn 30,001 – 40,000 while only 8% of the respondents earn within the range of 40,001 – 45,000.

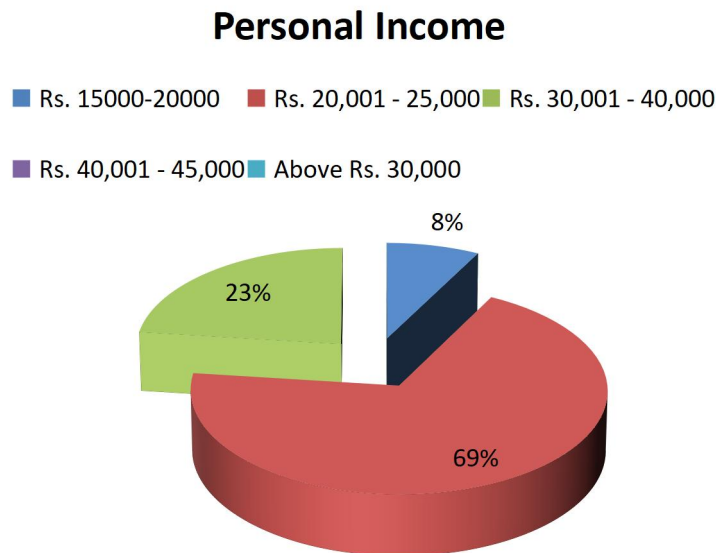


Figure 4.7: Personal Income

4.5.3 Educational Institutes

There is one primary school, secondary school and Government & Private Colleges present in the study area.

4.5.4 Facilities Available

Facilities available at the houses, shops and factories are depicted here. It shows that electricity, water supply, telecommunication, sewerage, gas supply and every other routine facility is available in study area.

4.5.5 Literacy Rate

From survey results, it was found that 14% of the studied population was illiterate, 36% was up to primary level, 43% studied up to middle level and only 7% of the respondents studied up to higher secondary level.

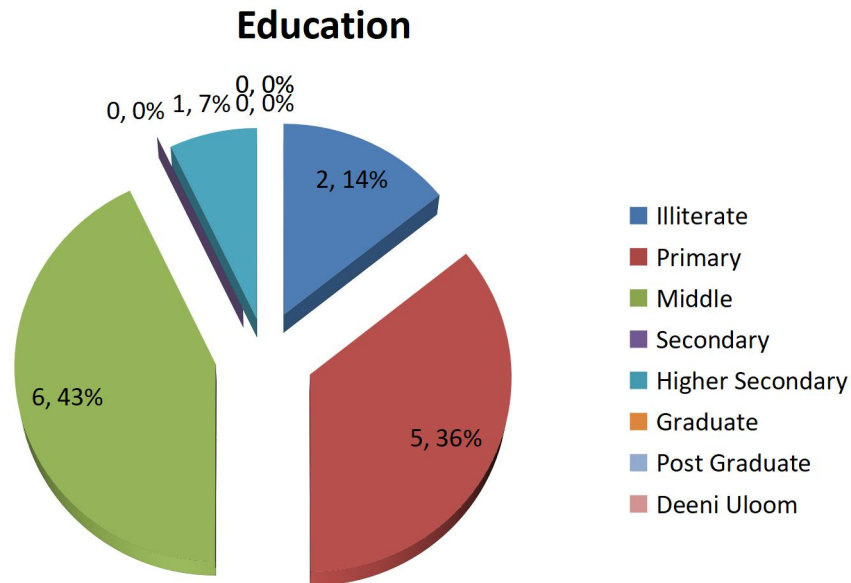


Figure 4.8: Literacy Rate

4.5.6 Common Diseases

According to the survey the common diseases recorded in the project area were, Diabetes, Fever, Hepatitis, Hypertension, stomach problems, Malaria, Typhoid, Nephritis and Diarrhea.

4.5.7 Favor for the Project

Respondents were inquired about their views regarding the proposed project. Out of total 14 respondents 70% of the respondents knew about the project whereas, rest of the respondents doesn't have prior knowledge of the project planning and commencement. Almost 85% respondents were in favor of the establishment of metal refinery unit in their vicinity as this will increase the employment opportunities and raise the overall socio-economic status of the area.

4.5.8 Community Issues

Community was asked about the burning issues they are facing. The majority of respondents complained about lack of sewerage system, solid waste management system, lack of safe drinking water supply, proper health and educational facilities.

SECTION-5

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

The following chapter will describe the overall possible impacts of said project on the physical, biological and socioeconomic environment due to the location, Design, during construction phase, during operation phase of the project and mitigation measures to minimize the significance of the possible impacts. The anticipated impacts related to this project have been assessed and mitigation measures provided accordingly.

5.1 Problem and its Occurrence

On the basis of the findings of the EIA, it is concluded that the project will not pose any adverse impact on the local population and the environment. A proper management plan shall be prepared in case of an accident like;

- Any health hazard to workers/other persons during construction or operation phase.
- Gaseous emissions to the environment.
- Inappropriate waste handling.

As mention above that, the project will not pose any adverse impacts to the environment. An assessment of impact during construction and operation phase is given in **Table below** - which indicates the impact and their magnitude.

Table 5.1: Anticipated Impacts and their magnitude of the Proposed Project

Environmental Components	Physical Environment												Biological Environment								Social Environment					
	Agricultural Lands	Soil (Erosion/Stability)	Housing	Cultural/Religious Properties	Infrastructure	Mineral Resources	Downstream River Flows	Flooding	Surface water quality	Groundwater quality	Air quality	Noise	Aquatic Ecosystem	Wetland Ecosystem	Terrestrial Ecosystem	Endangered Species	Natural Flora	Wildlife	Disease Vectors	Public Health/Safety	Land Use	Communication System	Employment	Community Stability	Cultural and Religious Value	
Components/ Activities																										
Construction Phase																										
Construction Camp site	N A	L A	O	O	O	O	N A	N A	O	L A	LA	LA	O	O	O	O	O	O	L A	O	L A	O	LB	O	O	
Digging and excavation activities	N A	L A	O	O	O	O	N A	N A	O	O	LA	LA	O	O	O	O	O	O	O	O	O	O	LB	O	O	
E&M of Equipments	N A	L A	O	O	O	O	N A	N A	O	O	LA	LA	O	O	O	O	O	O	O	LA	O	O	M B	O	O	

Vehicular Movement	N A	L A	O	O	O	O	N A	N A	O	L A	LA	M A		O	O	O	O	O	O		LA	L A	O	O	LA	O
Machinery and Equipment work	N A	L A	O	O	O	N A	N A	N A	O	O	LA	M A		O	O	O	O	O	O		LA	L A	O	LB LA		O
Operation Phase																										
Solid Waste	N A	L A	O	O	O	N A	N A	N A	O	L A	O	O		O	O	O	O	O	O		LA	O	O	O	O	O
Fire Fighting Arrangement	N A	O	O	O	O	N A	N A	N A	O	O	O	O		O	O	O	O	O	O		H B	O	L B	LB	M B	O
Health and safety	N A	O	O	O	O	N A	N A	N A	O	O	O	O		O	O	O	O	O	O		H B	O	L B	LB	M B	O
Waste water	N A	L A	O	O	O	N A	N A	N A	O	L A	O	O		O	O	O	O	O	O		LA	O	O	O	O	O

LA: Low Adverse

MA: Medium Adverse

HA: High Adverse

NA: Not Applicable

O: None or Insignificant

LB: Low Beneficial

MB: Medium Beneficial

HB: High Beneficial

ND: Not Determinable

5.2 General

This section identifies the potential impacts; related with design, construction and operation of the project on the physical, ecological and socio-economic domains of the environment. Accordingly, mitigation measures have also been proposed to manage the environment and for sustainable development. Strict environmental management will be observed during the project construction and regular operation phases. Legal requirements of the PEPA and the PEQS will be the rating standard for the activities. Compliance with the EMP and EMTP, as per recommendations in this EIA report will be adhered to with full spirit. The project proponent is filing with the EPA Punjab, written Affidavit, and Undertaking on judicial papers, that the project throughout its life will operate under Environmental Management Order. Under these conditions, the project at its all stages including from construction to the regular operation will go in compliance with the PEQS. The project activities will, therefore, neither adversely affects the population nor the environment around the project site.

5.3 Environmental Problems due to the Project Location

Environmental problems related to location of the project are mostly in the areas of physical setting, socioeconomic setting, ecological setting and special areas. Field survey revealed that the impacts of the project due to its location are mostly insignificant in nature as the project is housing scheme in its nature.

5.4 Environmental Problems due to the Project Design

The design of projects has sought to minimize any environmental potential impacts by ensuring that the project should be in according to the environmental standards. Local aesthetic value is another issue to be considered during project design.

5.5 Environmental Problems Associated with Construction and Operation

The construction will also sometimes go round the clock, therefore, during all construction activities the followings will be the major pollutants/wastes or project related pollution aspects:

Table 5.2: Project Impacts Associated with Construction

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
Dust emissions likely to occur during the excavation of the topsoil and loading and transportation of	Minor / Short Term	- Watering all active construction areas when necessary. - Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of free board. Pave, apply water when necessary, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
the construction waste.		areas and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites. • Fast growing trees will be planted around the project area to act as a windbreaker to reduce the particulate matter. • Provision of PPE to workers.
Hydrology and water quality degradation due to Storm-water runoff from the site and excavation	Minor / Short Term	• Installation of the septic tank. • The proponent will prepare a hazardous substance control systems and emergency response plans that will include preparations for quick and safe clean-up of accidental spills.
Oil spills from machines to be used on site and vehicles.	Minor / Short Term	The contractor will control the dangers of oil spills during construction by maintaining the machinery in specific areas designed for this purpose hence will not be a serious impact as a result of the construction.
Noise pollution due to the moving machines (mixers, tippers, communicating workers) and incoming vehicles	Minor / Short Term	• Install portable barriers to shield compressors and other small stationary equipment where necessary. • Use quiet equipment (i.e. equipment designed with noise control elements). Install sound barriers for pile driving activity. • Limit pickup trucks and other small equipment, observe a common sense approach to vehicle use and encourage workers to shut off vehicle engines whenever possible
Worker accidents and hazards during construction.	Minor / Long Term but reversible	• Provision of appropriate and adequate Personal Protective Equipment (PPE) to employees. • Enforcement and proper use of PPE by all construction workers. • Provision of appropriate tools, equipment, and machinery in sound working conditions to employees. • Proper arrangement of lighting to reduce accidents. • Development of clear policies on treatment of injured personnel.

Table 5.3: Project Impacts Associated with Operation of the Project

Possible Impact	Impact Magnitude	Proposed Mitigation Measures
Solid waste production during the operational activities.	Major / Long term	- There will be no generation of process related solid waste. The only solid waste generated from offices will be disposed of properly to avoid any threat to the environment. - The contractors to whom any waste recyclable material is to be sold shall be fully made aware of the environmental impacts and health effects of the waste to be sold to him if there is any.
Air Emissions will be generated from standby generator	Minor / Long Term	HVAC Equipment are used to reduce the emissions and clean the air
Disruption of water quality due to mixing of oils, grease, and lubricants during operations	Minor / Short Term	Water quality monitoring should be carried out at the site. Parameters to be monitored at all locations should include the same as prescribed by the PEQS.

5.6 Potential Environmental Enhancement Measures

As described above the worth mentioning wastes will be scrap waste, municipal solid waste and sludge. In order to enhance environment, the following measures will be adopted:

5.7 Solid waste & effluent management

Solid wastes are likely to be municipal solid waste and sludge from foodstuffs eaten by employees and from effluent treatment plant (ETP). The proponent will address all waste in the following ways:

- Rainwater disposal will be done through the adequate system to be provided at all levels of the project building.
- Sewage will be discharged to the main sewerage system; after its treatment and also getting the permission from the competent authority.
- Sale of recyclables and reusable materials to minimize waste for disposal.
- Establishing a waste generation and collection register for tracking the disposal of waste.
- All hazardous chemicals will be stored in original containers for ease of identification and handling.
- Appropriate PPE will be provided, and usage at all times ensured, to the workers handling hazardous substances

SECTION - 6

ENVIRONMENTAL MANAGEMENT & MONITORING PROGRAM

6.1 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.

6.2 Environmental Management Plan

The EMP provides mitigation and management measures for the following phases of the project:

6.2.1 Construction Phase

This section of EMP provides management principles for the construction phase of the project. Environmental actions, procedures, and responsibilities as required within the construction phase are specified. These specifications will form part of the contract documentation and therefore, the contractor will be required to comply with the specifications to the satisfaction of the Project Manager and Environmental Control Officer, in terms of the construction contract.

6.2.2 Operation and Mitigation Phase

This section of EMP provides management principles for the operation and maintenance phase of the project. Environmental actions, procedure, and responsibilities are required from proponent within the operation and maintenance phase are satisfied.

6.3 Schedule of Implementation and Environmental Budget

The implementation of an EMP will be based on ISO guidelines for continuous improvement environment management.

6.4 EMP implementation stages

To implement an EMP, four steps will be taken:

Stage I. Environmental Planning. Planning is one of the most important stages in the process of building and implementing EMP. For this the following must be determined:

- The organization's environmental policy;
- Environmental matters;
- Legal procedures and other requirements;
- General objectives and specific targets;
- Environmental management program, including;
 - designation of responsibility for achieving objectives and targets at each relevant function and level of the organization;
 - the means and the time to be achieved.

Stage II. Implementation and operation. For an effective implementation of the environmental management plan, the organization will develop resources and support mechanisms necessary to perform environmental policy, objectives and targets in this domain.

For the implementation of an EMP the following must be defined:

- Structure and accountability;
- Training and awareness;
- Documentation of the EMP;
 - Document control;
 - Operational control);
 - Prevention (emergency preparedness and response capacity).

Stage III. Checking and corrective action.

This step is a key element of the environmental management, which comes after planning and implementation of the environmental policy. The organization will control and correct, where appropriate, key elements of the environmental management. The organization will monitor and evaluate its environmental performance by;

- Monitoring and measurement;
- Non-conformity, corrective action and preventive action;
- Recordings (reports);
- Environmental management system audit (internal and external).

Stage IV. Management analysis. The organization will analyze and continuously improve its environmental management, aimed at improving overall performance. These analyzes can be made with the analyzes quality management system done by the leadership.

To maintain continuous improvement, fitness and effectiveness of the EMP, and through this, its performance, the organization management will review and assess the EMP at defined intervals. The management review will ensure that the necessary information is collected to allow management to continue this assessment.

This review shall be documented. Management review will address the possible need to change the strategy, objectives or other elements of the Environmental Management, in light of the audit systems of environment management results, changing circumstances and the commitment to continuous improvement. Reviewing the strategy, objectives and procedures will be carried out at the managerial level which defined them.

The review shall include:

- the audit results;
- the extent to which they achieved objectives and targets;
- continuous convenience of the EMP related to the changing information and conditions.

The implementation requires the involvement of all staff of the organization, whatever level of seniority and functions involved, and especially the employment of a dynamic and cyclic process of continuous improvement and self-assessment of environmental impacts.

The management cost that has to be spending on the mitigation measures has been estimated and is included in the following table.

TABLE 6.1: Environmental Management Cost

#	Component	Particulars	Estimated Cost	Allocation Capital Investment	Allocation Recurring Expenditure
1.	Water Pollution Control	Installation of in-house treatment facility comprising of primary & secondary treatment.	10,00,000	15,00,000	1,00,000
2.	Occupational Health, Safety & Environment	Glares, Breathing Masks, Gloves, Boots, Helmets, Ear Plugs etc. & annual health-medical checkup of workers and water filtration plant	10,00,000	12,00,000	2,00,000
3.	Noise Pollution Control	Installation of anti- vibration pads.	1,00,000	1,50,000	--
4.	Waste Management	Disposal of hazardous waste.	--	--	1,00,000
5.	Green Belt	Green belt development & maintenance	1,00,000	1,50,000	1,00,000
6.	Energy conservation	Installation of solar street lights within project premises	3,00,000	5,00,000	--
7.	Environment Monitoring	Environment Monitoring Parameters	--	--	4,00,000
		Emissions from standby generator			
		Noise of working area			

#	Component	Particulars		Estimated Cost	Allocation Capital Investment	Allocation Recurring Expenditure
		Effluents	All parameters as required by EPA			
Total (Rs.) =				25,00,000	35,00,000	9,00,000

6.5 Environmental Management Team along with their Roles and Responsibilities

The proponent will make sure the implementation of EMP through its qualified team of professionals. The trainings will be arranged as required for the implementation of the Environmental Management and Monitoring Program.

Sr. No	Designation	Responsibility
1	Assistant Manager	To ensure legal requirements are addressed in legal register and implemented. Conduct frequent review of legal requirements and other requirements and record the compliance review. Communicate with senior management and arrange meetings regarding required actions for the legal compliances.
2	SHE Engineer / Assistant Manager	➤ To conduct EHS risk assessment of all activities in plant (routine and non-routine) in liaison with operations. Ensure frequent review of risk assessments and verify implementation of control measures. ➤ To implement recommended practices for conservation of natural resources.
3	SHE Engineer	To assist central EHS in conducting all relevant internal and external communication.

6.6 Environmental Monitoring Program

The monitoring program is designed to ensure that the requirements of the NOC awarded by the EPA are met. Monitoring Program (MP) provides important information that allows for more effective planning and an adaptive response based on the assessment of the effectiveness of mitigation measures. The monitoring of various parameters will help to determine the extent to which project construction/operation activities will cause an environmental disturbance. Following is a tentative plan for environmental monitoring.

Table 6.2: Environmental Monitoring Program

Environmental segment / element	Monitoring parameters	Reference location / monitoring point	Monitoring frequency
CONSTRUCTION PHASE			
Water Quality	As prescribed by the Punjab Environmental Drinking Water Quality Standards	Main Drinking Water Source	Quarterly
Ambient Air Emissions	Dust, smoke, PM, SO _x , NO _x , CO,	Use of generators, movement of materials, digging or excavation	Quarterly
Wastewater including Sewage	Ensure that all wastewater is treated to the level set by the PEQS-Pakistan.	The sewage or sanitary wastewater by the campsite and use for other construction activities	Quarterly
Noise	The Levels prescribed as in Punjab environmental quality standards	The noise produced by the machinery during construction work.	Quarterly
Solid Waste Disposal	Ensure that all wastes are disposed of according to legal requirements	The waste material, rubble and solid waste produced by the construction activities	Quarterly

6.7 EMP Reporting and Reviewing Procedures

The EMP intends to be a 'living' document that will be responsive to changes in construction plans, stakeholder priorities and research results. Notwithstanding the evolution of the document in response to an expanding knowledge base, the logic behind the EMP should remain. Amendments to the EMP may require engagement with relevant stakeholder groups. As a minimum, the EMP will need to be reviewed and, if necessary, revised in conjunction with changes to the construction and operation phase. Changes to the construction and/or operation schedule or methods, and recommendations based on the performance monitoring of the control measures, will necessitate changes to the EMP. The performance of the EMP should be audited periodically (annually).

6.7.1 Environmental Monitoring

A schedule of statutory and internal monitoring requirements for the site is to be included. Monitoring is to be carried out in accordance with the Monitoring and Reporting schedule.

6.7.2 Reporting

Various statutory and internal reports will need to be prepared and submitted to assist in monitoring and advising on environmental performance. Examples that are applicable to the operation phase include:

Monthly internal monitoring report

A quarterly report is required. This is to be included with contract administration documentation. This report will include a summary and an analysis of monitoring results collected following the previous month's report along with the third-party monitoring reports. Areas of concern are to be reported together with corrective actions (if required). The report will include provision for the following.

- Environmental Incidents and Corrective Actions
- Environmental Monitoring
- Audits and Regulatory Non-conformance
- Land Management (including clearing and rehabilitation)
- Water Management
- Waste Management
- Stakeholder Engagement
- Community and Safety Monitoring
- Community and Safety Incidents and Corrective Actions
- Licenses and Legislation.

6.7.3 Annual internal environmental audit report

An Annual Internal Environmental audit and Social (Sustainability) Report is required. This report will compile information from the quarterly monitoring reports into one document.

6.7.4 Records

All records shall be stored in an electronic format and retained for a period of not less than five years.

6.7.5 Auditing

Periodic audits (internal as well as third party) will be undertaken. The audits will be of the systems and, importantly, of the environmental outcomes.

6.7.6 Management review

A management review of the EMP will be carried out annually with third party assistance.

6.8 Need of Training to Implement EMP

Periodic training will be carried out by the proponent with the help of third-party consultant to ensure the implementation of the EMP. Furthermore, the auditing process will be formulated to check the overall performance of the EMP.

Table 6.3: ENVIRONMENTAL MANAGEMENT PLAN (CONSTRUCTION PHASE)

Sr. No.	Project Component/ Impact	Project Activities	Targets to be Achieved	Mitigation/ Preventive Action	RESPONSIBILTIIY	
					Implementation	Monitoring
CONSTRUCTION PHASE						
1.	Air Quality	Storage, Handling, and Transport of Material	Compliance with prescribed PEQs to control air pollution	- Necessary measures like a sprinkling of water on a regular basis, especially during dry climatic conditions, should be taken to limit pollution from dust and other windblown materials. - Periodic maintenance and management of construction machinery and vehicles - Waste burning will not be allowed.	During Construction Phase by Contractor with coordination of Proponent staff	Proponent Consultant
2.	Water Quality	Sanitation and wastewater disposal at campsite Storage, Handling and Oil spills due to rough handling of the materials. Stagnant water causes diseases and bad odor problems. Construction work on water body increases the risk to water quality.	Control of groundwater or surface water pollution from construction activities	- Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater/surface water. - Furthermore, septic tanks will need to be constructed which will be cemented to prevent the groundwater contamination. - Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater/surface water Prohibit illegal dumping of waste. - The contractor will repair/replace / compensate for any damages caused by the Construction activities to the drinking water source/s.	During Construction Phase by Contractor with coordination of Proponent staff	Proponent Consultant

3.	Waste	Generation and Disposal of Solid waste near campsite. Dust and particulate matter emissions due to excavation digging and during other construction activities of the project	Proper & safe handling and disposal of Construction related waste Compliance with applicable waste management rules for hazardous and non-hazardous waste disposal Implementation of waste management plan	• Ensure prevention of inappropriate disposal of waste material. • Conduct separate collection of construction and office waste to promote recycling and re-use. • Dispose of non-recyclable and hazardous waste material properly according to waste management rules. • Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing of the excess material. • No waste or debris will be thrown into the nearest canal water or other water bodies. • The contractor will prepare waste management plan related to construction activities; get its approval from site engineer and ensure its full implementation.	During Construction Phase by Contractor with coordination of Proponent staff	Proponent Consultant
4.	Noise	Haulage Roads and Movement of Construction Vehicles. The use of heavy machinery and equipment causes noise. Noise generated by generator.	Compliance with prescribed PEQs to control Noise pollution	• The contractor will strictly follow the PEQs for ambient noise • Control noise through control of working hours and selection of less noisy equipment. • Prohibit use of pressure horns • Provision of acoustic enclosures (hood and shrouds) on generator • Proper maintenance of vehicles and construction equipment. • Minimize/avoid unnecessary use of pneumatic drills and other noisy machinery.		Proponent Consultant

				The personal protective equipment (PPE) will be provided to the construction workers and its usage will be made mandatory During Construction Phase by Contractor with coordination of Proponent staff		
5.	Materials Management	Transport of Hazardous Material (oils, Oil products). Storage areas for the hazardous material and other construction material.	Safe and secure environment for construction workers	- Stockpiles shall not be situated such that they obstruct natural water pathways. - Stockpiles shall not exceed 2m in height unless permitted by Concerned Engineer on site. - If stockpiles are exposed to windy conditions or heavy rain, they shall be covered either depending on the duration of the project. Stockpiles may further be protected by the construction of low brick walls around their bases. - All substances required for vehicle / machinery maintenance and repair must be stored in sealed containers until they can be disposed of / removed from the site. - Hazardous substances / materials are to be transported in sealed containers or bags. - Spraying of insecticide shall not take place under windy conditions	During Construction Phase by Contractor with coordination of Proponent staff	Proponent Consultant
6.	Workers Health & Safety	Risk of damage to worker health Risk of any damage by machine, chemicals, liquid	Prevention of any possibility of work site accident/impact on worker's health	- Provision of Personal Protective Equipment to the workers. - Provision of first aid box at work site to cope with emergency situation. - Safety training to the workers.	During Construction Phase by Contractor with coordination of Proponent staff	Proponent Consultant

		waste etc. can be reduced by using safety signs at construction site and campsite		• Safe driving training to the drivers. • Adequate safety signs on site. • Provide training regarding proper handling and use of chemicals/ paints. • Install fire extinguishers at fire handling places. • Inspect and ensure that any lifting devices, such as cranes, are appropriate for expected loads. • Any loss of public/ private property will be compensated by the contractor. • Regular checks should be carried out to ensure a contractor's is following safe working procedures and practices.		
7.	Socioeconomic Impacts	Conflicts between locals may arise during construction activities	Prevention of conflicts among locals and make the project socially acceptable Empowerment of locals to possible extent Increase in employment and business opportunities for locals	• Contractor's activities and movement of staff to be restricted to designated construction areas. • The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time. • Lighting on the construction site shall be pointed downwards and away from oncoming traffic. • The site must be kept clean to minimize the visual impact of site. • Machinery and vehicles are to be kept in good working order for the duration of the project to minimize noise nuisance to neighbors. • Noisy activities must be restricted to the times given in the Project Specification or General Conditions of contract. • The Contractor is responsible for	During Construction Phase by Contractor with coordination of Proponent staff	Proponent Consultant

				ongoing communication with those people that are interested in / affected by the projects. • Employ local residents as much as possible. Promote communication between external workers and local people (e.g. join local events).		
8.	Clearance of site from extra/surplus material and construction equipment	The cutting of trees or flora of the site. Removing extra soil by excavation and digging	Restoration of site to a similar condition prior to the commencement of the work or to a condition agreed with the project management and landscaping of the site	• Timely removal of waste from the site to avoid congestion at workplace. • Construction waste should be collected and disposed separately of other waste. Care will be taken during handling and disposal of waste. • Contaminated soil (if generated) due to accidental spills will be removed and transported to the suitable site for disposal. • Safe transportation of construction equipment from the site. • The contractor must ensure that all structure, equipment, materials, and facilities used or created on site for/or during construction activities are removed. • Empty/available space will be covered with grassy lawns. • Use of native vegetation as a part of the landscape. Ornamental plant species like roses, jasmine, and seasonal flowers can be used in proposed landscaping, which is a common practice in this part.	During Construction Phase by Contractor with coordination of Proponent staff	Proponent Consultant

TABLE 6.4: ENVIRONMENTAL MANAGEMENT PLAN (OPERATIONAL PHASE)

Sr. No.	Project Component / Impact	Project Activities	Targets to be Achieved	Mitigation / Preventive Action	RESPONSIBILTYY	
					Implementation	Monitoring
OPERATIONAL PHASE						
1.	Solid waste	The waste produced is specifically the municipal solid waste.	Compliance with waste management rules. Proper Management of waste. Prevention of inappropriate waste disposal	The contractors to whom any waste recyclable material is to be sold shall be fully made aware of the environmental impacts and health effects of the waste to be sold to him if there is any.	HSE Executive of Project / Proponent	Proponent
2.	Noise Impacts	The noise generated by machinery and standby generator	Compliance with prescribed PEQS to control Noise pollution	- Noise will be generated from the standby generator. - Proper covering of standby generator, to reduce the noise. - Noise reduction measures like buffering of noise through trees should be adopted where deemed necessary to reduce the noise level at the project boundary. - Mitigation measures during operation for noise impacts on workers will include standard occupational health and safety practices	HSE Executive of Project / Proponent	Proponent
3.	Water quality	The proper disposal of the sewage water into the drains	Compliance with wastewater standards of PEQS	- Installation of ETP so any wastewater produced complies with wastewater standards of PEQS - Runoff water is collected in the pond and after appropriate treatment will be utilized for	HSE Executive of Project / Proponent	Proponent

				horticulture		
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TABLE 6.5: ENVIRONMENTAL MANAGEMENT PLAN (DE-COMMISSIONING PHASE)

Project activities	Type of impact	Potential impacts on environment	Extent / Magnitude	Mitigation Measure	Institutional Responsibility	
					Implementing body	Supervision
DE-COMMISSIONING PHASE						
Noise Generation	Physical, Social & Biological	Nuisance to Local community	Less/ adjacent area	- Carrying out the decommissioning works only during the specified time where permissible levels of noise are high and acceptable. - Vehicles should be maintained regularly to reduce noise resulting from friction. - Providing workers with PPEs such as earmuffs	Contractor	Proponent
Demolition waste generation	Physical, Social & Biological	Disturbance to local community	Less	- Removing reusable and recyclable material from the building before demolition to minimize the amount of waste. - Making available suitable facilities for the collection, segregation and safe disposal of the wastes.	Contractor	Proponent
Emission of Air Pollutants	Physical, Social & Biological	Disturbance to surrounding environment and local community	Less/adjacent area	Using efficient equipment and machines with efficient engines meaning low emission.	Contractor	Proponent
OSH Risks	Physical & Social	Health hazards to workers	Less	- Ensuring all storage parts are labeled. - Raising awareness and educating workers on risks from equipment and ensuring they	Contractor	Proponent

				receive adequate training on the use of the equipment. • Providing the workers with adequate PPEs and monitoring regularly		
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6.9 Emergency Response Plan & Evacuation / Exit Plan

6.9.1 Emergency Response Plan

The objective of this plan is to prepare the workers at the project site to rescue from various emergencies that may occur at the workplace during the operation or else activities at project site.

6.9.2 Scope

This plan assesses risks, assign roles and responsibilities, and outlines steps to be followed in any emergency situation. It increases understandings of employees in the handling of different types of emergencies which may occur at the project site.

6.9.3 Types of Emergencies

Enlisted below are some emergencies which may occur at workplace/dormitories:

- Fire Hazards
- Chemical/Oil/ spillage
- Hazardous / Toxic Gas Release
- Extreme Weather Conditions
- Earthquake
- Flood

6.9.4 Responsibilities

The overall responsibility lies with EHS Manager supported by Departmental Heads/BUM's/Country Security Manager. Central EHS Team will be overall responsible for implementation of ERP Plan. EHS Manager and Departmental (EHS Rep) will be responsible for emergency preparedness that includes the availability of resources, training of staff and monitoring and maintenance of emergency equipment's and conduction of drills.

Response Measures

- Ashiq Muhammad & Sons Private Limited will maintain a dedicated emergency response department equipped with fire tenders along with all required emergency handling accessories. Fire water network mains coupled with hydrants are encircling the whole premises. A pump maintains the network pressure at 100psi (7 Bar) in normal conditions. A fire diesel engine & electric driven pumps are also installed to maintain the fire network pressure at 7 Bar during the firefighting. A fire water reservoir capacity of approx. 100,000 USG firefighting is also located inside facility. Likewise, an overhead tank of capacity 12000 USG and a Chest of capacity 2,64,000 USG is also available.
- Scenario based emergency response drills & evacuation plans.
- Fire Extinguishers, fire alarm system, fire blankets, Hydrants & monitors, Eye washers, Hose reels, are installed in all buildings, plant areas and other offices.

6.9.5 Important Records

- HSE Executive / Security Officer / Supervisor must maintain the following updated records at all times:

- List of staff trained in firefighting procedures.
- Location of hazardous materials in each section.
- List of evacuation zones and their assembly points.
- Location of isolation switches/valves.
- List of firefighting and first aid equipment available in each section.

6.9.6 Support Services

One electrician, one mechanic and four general workers (for salvage operations) will be arranged to ensure the necessary services to the unaffected areas continue and removal of any equipment etc. which may be affected by the incident.

6.9.7 Emergency due to Fire Hazards

6.9.7.1 Fire Fighting System

The fire protection systems shall be designed as per NFPA codes:

- NFPA 101 – Life Safety Code,
- NFPA 14 – Stand Pipe and Hose system
- NFPA-22 – Standard for water tanks for fire protection
- NFPA-10 – Standard for portable fire extinguishers

The fire-fighting system shall include the following:

- External Fire Hydrant system
- Portable Fire extinguisher
- Self-triggered standalone type fire extinguisher filled with clean agent shall be provided in the Server room.
- Fire pumps and electrical control panel.

Water will be drawn from fire reserve tanks by electrically driven jockey pumps (independent for fire hydrant), electrical pumps & standby diesel engine driven pump into a common suction header for fire hydrants. Fire water network mains coupled with hydrants are encircling the whole premises. A jockey pump maintains the network pressure at 100psi (7 Bar) in normal conditions. A fire diesel engine & electric driven pumps are also installed to maintain the fire network pressure at 7 Bar during the firefighting.

6.10 Training

- All concerned residents and contractors will receive training in the general plan procedures and specific departmental procedures related to the plan. Training will cover evacuation procedures, incident discovery, notifications, basic firefighting, fire extinguishers and first aid.
- All supervisors will receive additional training, for the safety of personnel, visitors, and the protection of facility assets.
- All emergency response team members receive specialized training for the response to and handling of emergency situations that could occur at the facility.

SECTION - 7

STAKEHOLDERS CONSULTATION

7.1 General

General Public consultation refers to the process by which the concerns of local affected persons and others who have plausible stake in impacts assessment of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. According to the IEE & EIA Regulations, 2022 public consultation is mandatory for any socio-environmental study. For this purpose, assessment survey and public consultation sessions held with different stakeholder groups that may be impacted. The consultation process was carried out in accordance with the guidelines laid by EPA, Punjab.

The objectives of this process were to

- Share information with stakeholders on proposed project installation and operation.
- To access the impacts on the physical, biological, and socio-economic environment. Stand Understand stakeholder concerns regarding various aspects of the project.
- Understand the perceptions, assessment of social impacts and concerns of the communities of the project area.
- Find out the awareness level and situation of acceptability to identify any issues for the implementation of said project.
- To invite people to express their views about the positive / negative impacts on their life styles and environment.

This report includes all the comments, which were taken into account in preparing the definitive development concept for the installation of the project.

7.2 Consultation Mechanism

Primary stakeholders were consulted during informal and formal meetings. The consultation process was carried out in the Urdu language. During these meetings a simple, non-technical, description of the project was given, with an overview of the project's potential human and environmental impact. This was followed by an open discussion allowing participants to voice their concerns and opinions. In addition to providing communities with information on the proposed project, their feedback was documented during the primary stakeholder consultation. The issues and suggestions raised were recorded in field notes for analysis, and interpretation.

By reaching out to a wider segment of the population and using various communication tools such as participatory needs assessment, community consultation meetings, focus group discussions, in - depth interviews, and participatory rural appraisal IEE involved the community in active decision-making. This process will continue even after this IEE has been submitted, as well as during future IEE in which similar tools will be used to create consensus among stakeholders on specific environmental and social issues.

Secondary stakeholder consultations were more formal as they involved government representatives and local organizations, consulted during face-to-face meetings. They were briefed on the IEE process, the project design, and the potential negative and positive impact of the project on the area's environment and communities. It was important not to raise community expectations unnecessarily or unrealistically during the stakeholder consultation meetings in order to avoid undue conflict with community's leaders or local administrators. The issues recorded in the consultation process were examined, validated, and addressed in the IEE report.

This section involves communication of possible impacts and concerns with

- ✓ Proponents Environmental Management Team
- ✓ The responsible authority
- ✓ Other departments and agencies
- ✓ Environmental practitioners and experts
- ✓ Affected and wider community

7.3 The responsible authority

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.

7.4 Other Departments and Agencies

Officers/ officials of all the line Government departments were consulted regarding the proposed project.

7.5 Summary of Issues Raised by Stakeholders

A summary of the key issues raised by stakeholders and how these are being addressed by Project Proponent is provided in Table below.

Table 7.1: Summary of issues and commitments by Proponent

Issue	Aspect / Concern raised by Stakeholders	Project Proponent Commitments
Employment Opportunities	Expectations of employment are very high. Job opportunities are less for herders as they generally have less skills and training.	Employment is the main priority of the industry. Mostly locally skill and unskilled labor will be prioritized and also there will be job in executive level. Max. persons according to the requirement will be employed by the industry.
Training Opportunities	People are keen to consult with subject industry if the Project offers training and upgrading opportunities to enhance their trade or professional skills.	Development of the Training Strategy, including commitment of allocation of budget investment for training infrastructure, delivery and design.
Health	Truck traffic is a main	● Keep check on the road corridor

Issue	Aspect / Concern raised by Stakeholders	Project Proponent Commitments
& safety	concern because the road used by the Project passes through a number of small communities and different industries and there will be a high volume of trucks transporting concentrate.	and safety aspects, including on herder and animal crossings. • Development of Transport Management Plan including traffic safety training. • Traffic advisory signs will be installed along project site and all nearby specific areas.
Local economy and business development	Local service providers are keen to participate in providing services to provider a material and expect to receive in order to adjust their businesses to meet specific needs. Local businesses want to receive support in terms of finance and facilities to diversify their businesses. Local/regional companies and entrepreneurs have limited understanding about meeting the high volumes required by the Project and the quality standard, but are keen to know these requirements so they can become suppliers.	• Proponent has main focus that they will all the material regarding construction and plant operation to buy from the local market. • This will help the local and small business and to people who are keen interested to become suppliers.
Environmental Issues	Dust and noise impacts, particularly from the construction activities and in operation of mechanically unfit machines, are of concern to herders and other residents. Environmental degradation during road construction and use. Loss and change of vegetation due to soil degradation. Increased waste along project boundary and around economic zone.	• Implementation of controls under the Environmental Management Plans, including on and off-site dust and noise monitoring. • A Participatory Environmental Monitoring Program will be launched to spread awareness on HSE.

SECTION-8

CONCLUSION AND RECOMMENDATIONS

8.1 Conclusions

Based on the study conducted for Environmental Impact Assessment (EIA) of the project, the following recommendations are made:

- Plantation as far as permissible and within the scope of the project is carried out.
- Sustainable development approach through conservation of the natural environment is followed.
- Environmental aspects of the project should be well-taken care through implementation of the Environmental Management Plan as recommended in this report.
- Quarterly monitoring of all-out environmental pollution sources by a third party would be required who will also certify that the project is running in accordance with legal requirements

8.2 Recommendations

On the basis of the findings of the EIA, it is concluded that the construction and installation of the proposed project will not pose any adverse impact on the local population and the environment. Therefore, it is recommended that the competent authority may please issues Environmental Approval for the construction and operation phases of this project.

GLOSSARY

Words

Air Quality Sensitive Receptors

**Air Quality Standard
Annual Average
Rainfall**

Annunciation

Anticipated Impacts

Aspects

Atm

Baseline

Biodiversity

Climate

Climate Change

Compliance

Cutting

Decibel(S)

Discharge

Discrepancies

Dust

Earthworks

Ecosystem

Effluent:

Environment

Dictionary

People, property, species or designated sites for nature conservation that may be at risk from exposure to air pollutants potentially arising as a result of a proposed development.

Air quality limiting values and objectives.

Average amount of precipitation falling at a specified site recorded by the Meteorological Office. It gives a measure of the overall wetness of the local climate.

A formal public statement

Expected Impacts

A distinct feature or element in a problem

Standard unit of atmospheric pressure; the pressure exerted by the weight of air in the atmosphere of Earth

Existing environmental conditions present on, or near a site, against which future changes can be measured or predicted.

The variety of life in the world or in a particular habitat or ecosystem.

The climate can be described simply as the 'average weather', typically looked at over a period of 30 years. It can include temperature, rainfall, snow cover, or any other weather characteristic.

A change in the state of the climate, which can be identified by changes in average climate characteristics that persist for an extended period - typically decades or longer.

Acting according to certain accepted standards

A linear excavation of soil or rock to make way for a new railway or road. Cuttings help reduce the noise and/or visual impact of passing trains or road vehicles.

A unit used to express relative differences in sound power or intensity. There is a million to one ratio in sound pressure (measured in Pascal (Pa)) between the quietest audible sound and the loudest tolerable sound. The decibel (dB) scale, based on a logarithmic ratio, is used in sound measurement because of this wide range. Audibility of sound covers a range of approximately 0-140dB.

Spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping

A difference between conflicting facts, claims or opinions

All airborne particulate matter.

The removal or placement of soils and rocks such as in cuttings, embankments and environmental mitigation, including the in-situ improvement of soils/rocks to achieve desired properties.

A biological community of interacting organisms (e.g. plants and animals) and their environment.

Any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapour.

Air, water and land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and

	works; all social and economic conditions affecting community life; and the inter-relationships between any of the factors mentioned.
Environment Agency	Government agency established to protect and improve the environment and contribute to sustainable development. Responsibilities include: water quality and resources, flooding and coastal risk management and contaminated land.
Environment Budget Evaluated	Monetary assets reserve for Environmental activity Estimate or determine the nature, value, quality, ability, extent, or significance of
Excavated Material	Soil, rock and other material that has been removed from the ground during construction.
Fauna	All the animal life in a particular region or period
Flora	Variety of Plants found in an area
Greenhouse Gas	A gas such as carbon dioxide, methane, chlorofluorocarbons, nitrous oxide, ozone, and water vapor that contributes to the greenhouse effect by absorbing infrared radiation.
Groundwater	All water that is below the surface of the ground and within the permanently saturated zone.
Groundwater Body	A distinct volume of groundwater within an aquifer
Heavy Metals	A loosely defined term which refers to a group of metal and metalloids, many of which are toxic to some degree. Impact Used throughout this IEE Report to refer to changes to the environment that have the potential to occur as a result of the construction and/or operation of the Proposed Scheme.
Impact	Used throughout this Environmental Impact Assessment report to refer to the consequence of an impact to the receiving environment.
Initial Environmental Examination	A preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an environmental effect for requiring preparation of EIA
Legislation	Law enacted by a legislative body
Million	10,00,000
Mitigation	The measures put forward to prevent, reduce and where possible, offset any adverse effects on the environment.
Mitigation Measures	Measures aimed to curtail or entirely control an adverse impact or to compensate some loss or cause additional improvements
Punjab	The permissible standards for emission of air pollutants and noise and for discharge of effluent and waste specifically in Punjab.
Environmental Quality Standards	
Nuisance	Annoyance
Orientation Session	Direction Session
Potential Issue	Problems likely to arise
Proposed Project	Planned activity
Rehabilitation	The conversion of wasteland into land suitable for use of habitation or cultivation
Residual Impacts	Impacts left behind after implementation of the mitigation measures
Risk Assessment	An assessment of the probability of a hazard occurring that could result in an impact.

Sand	Soil particles from 0.06mm-2.0mm in equivalent diameter. Fine sand particles are from 0.06mm-0.2mm; medium sand from 0.2mm-0.6mm; and coarse sand from 0.6mm-2.0mm.
Scoping	An initial stage in the Initial Environmental Examination process to determine the nature and potential scale of environmental effects arising as a result of a proposed development, and an assessment of what further studies are required to establish their potential environmental impacts and effects.
Screening	The first stage in an Initial Environmental Examination. It is used to determine if further assessment is necessary and to categorize the project.
Significant Soil Erosion	Important The detachment and movement of soil by the action of water and/or wind.
Soil Profile	A vertical cross-section through a soil.
Stakeholders	A person or organization with an interest or concern in Something
Statutory Requirements	Legal Requirements
Substitutions	An event in which one thing is substituted for another
Surface Water	Waters including rivers, lakes, reservoirs, canals, streams, ditches, coastal waters and estuaries.
Sustainability	such developments that meet the needs of the present generation without compromising the ability of future generations to meet their needs.
Topography	The natural or artificial features, level and surface form of the ground surface.
Topsoil	Upper layer of a soil profile, usually darker in color (because of its higher content of organic matter) and more fertile than subsoil, and which is a product of natural biological and environmental processes.
Waste	Any material, substance, or by-product eliminated or discarded as no longer useful or required after the completion of a process

List of abbreviations

°C	Degree Celsius
°F	Fahrenheit
BOD	Biochemical Oxygen Demand
CC	Construction Contractor
CDM	Clean Development Mechanism
CO	Carbon Monoxide
CO ₂	Carbon dioxide
COD	Chemical Oxygen Demand
dB(A)	A weighted decibel scale
DO	Dissolved Oxygen
IEE	Initial Environmental Examination
EMMP	Environmental Mitigation and Monitoring Plan
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
EPO	Environmental Protection Order
ERP	Emergency Response Plan
GHGs	Green House Gases
GOP	Government of Pakistan
EIA	Environmental Impact Assessment
Km	Kilometer
Ltd.	Limited
m ³ /h	Cubic meter per hour
MW	Megawatt
NA	Not Applicable
NCS	National Conservation Strategy
NEP	National Environmental Policy
PEQS	Punjab Environmental Quality Standards
NGO	Non-Government Organization
No.	Number
NOC	No Objection Certificate
NO _x	Oxides of Nitrogen
OHSAS	Occupation Health and Safety Assessment Series
PEPA, 1997	Pakistan Environmental Protection Act, 1997
PEPA, 2012	Punjab Environmental Protection Act, 2012
PEPC	Pakistan Environmental Protection Council
PEPO	Pakistan Environmental Protection Ordinance
PHA	Parks and Horticulture Authority
PKR	Pakistani Rupees
PM	Particulate Matter
PPEs	Personal Protective Equipment
Pvt.	Private
SOPs	Standard Operation Procedures
SO _x	Oxides of Sulfur
TDS	Total Dissolved Solids
Tpd	Tons per day
TSS	Total Suspended Solids

REFERENCES

- 1 Environment related Laws in Pakistan and the Province of Punjab;
- 2 Google earth, maps.
- 3 Guidelines for Preparation and Review of Environmental Report
- 4 Guidelines for Public Consultation
- 5 Information and data provided by project proponents;
- 6 Information collected from the Technical documents of various suppliers of machinery/equipment.
- 7 Information gathered through discussions with the project related persons of the project proponent;
- 8 Labor Laws
- 9 Meteorological data from meteorological department and website
- 10 National Environmental Policy 2005
- 11 National Environmental Quality Standards (Self-Monitoring and Reporting by Industries) Rules, 2001
- 12 Pakistan Environmental protection act 1997
- 13 Punjab Environmental Protection Agency IEE/EIA Regulations, 2022.
- 14 Pakistan Environmental Protection Order (PEPO) 1983
- 15 Pakistan Penal Code, 1860
- 16 Provincial Wildlife Act, 1974
- 17 Punjab Environmental Protection Act 1997
- 18 The Land Acquisition Act, 1894
- 19 workplace safety and health act 2011

TERMS OF REFERENCES

These terms and references are being submitted for the subject EIA study under clause 5(f) of policy and procedure for the filing, review and approval of environmental assessment. These TORs of EIA has been prepared by ChemSA in consultation with proponent of the project. Proposal and TORs for the EIA accepted by the M/s Ashiq Muhammad & Sons Private Limited.

1. INTRODUCTION OF PROJECT

Subject project is M/s Ashiq Muhammad & Sons Private Limited" situated at Mouza Alipur, Tehsil Jalalpur Peerwala, District Multan which will be designed for residential homes.

2. COST OF PROJECT

The total cost of subject project is about Rs. 46.2-Million.

3. AREA OF THE PROJECT

Total area of the proposed project is 29-Kanal, 15-Marla

4. NAME OF PROPONENT

Name : Muhammad Zawar S/o Ashiq Muhammad
CNIC No. : **36301-8032763-1**
Address : Ghazipur Bahalli, Tehsil Jalapur Peerwali, District Multan

5. ENVIRONMENTAL CONSULTANT & CLINT

The project proponent appointed M/s ChemSA as Consultant for the subject project to conduct the Environmental Impact Assessment. M/S ChemSA will be called as "CONSULTANT" and "M/s Ashiq Muhammad & Sons Private Limited" will be called as "CLIENT".

6. OBJECTIVE OF THE STUDY The objective of the study includes the compliance of Section 12 of Punjab Environmental Protection Act-1997, Punjab Environmental Quality Standards and fulfillment of HSE conditions.

7. PURPOSE OF THE STUDY

The key objectives of the EIA are to:

- i. Document the ecological and socioeconomic baseline conditions of the study area and the affected communities.
- ii. Inform and obtain input from stakeholders (e.g. government authorities, public and indigenous communities) and capture their relevant issues and concerns.
- iii. Assess in detail the environmental, social and health impacts that would result from the Project.
- iv. Identify environmental and social mitigation measures to address the impacts identified.
- v. Develop the EMPs as discussed above, based on the mitigation measures developed in the EIA.
- vi. Meet the requirements or recommendations of the applicable National Environmental Laws and Guidelines.

8. CLIENT RESPONSIBILITY

We expect the following inputs from the clients:

- I. As soon as the Proposal is accepted, the Consultants will request for the nomination of senior officer to be nominated as Coordinator who will be responsible for all coordination activities as required by the Consultants and to whom the Consultants will refer for information and assistance. All correspondence between the Consultants and the CLIENT will be routed through the Coordinator.
- II. ChemSA require free access to all relevant information available with the Client.
- III. Assess and identify major potential issues and impacts particularly those which may have influence on design, construction and operation at any stage.
- IV. The report developed for the CLIENT shall be the property of the CLIENT and the Consultant shall adhere to confidentiality morality as well as legally.
- V. Client will provide relevant documents as,
 - a) Signed application on company letter head (pattern will be provided).
 - b) Affidavit on Rs 100- Stamp Paper (pattern will be provided)
 - c) Undertaking on Rs. 100/- Stamp Paper (pattern will be provided)
 - d) Demand Draft of Rs. 30,000/- in favour of Director General, Environmental Protection Agency Punjab, Lahore
 - e) Copy of NIC of proponent
 - f) Signature on Schedule IV (pattern will be provided)
 - g) Detail Company Profile
 - h) Details of firefighting Equipment
 - i) Layout Map of the project
 - j) Other NOCS/Certificates form other concerned departments (if any)
- vi. If any legal litigation arises from stockholders during the proceeding of EIA. The consultants will not be responsible for the delay in the approval process.

Signature:
CONSULTANT
M/S CHEMSA

Signature:
CLIENT
M/s Ashiq Muhammad & Sons Private Limited