

EXECUTIVE SUMMARY

TITLE OF PROJECT

This executive summary presents an overview of the main findings of the Environmental Impact Assessment Report for Establishment of LPG Storage and Refilling Plant of M/s “Heaven Gas (Pvt.) Limited”. The objective of the project is to construct and operate LPG Storage and Filling Plant in an environment friendly manner.

As per the statutory notification of Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), The project for the Establishment of LPG Storage and Refilling Plant falls under **Schedule II** (List of projects requiring an EIA). For this instance, Environmental Impact Assessment of the Project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 2022. The process for conducting environmental assessment and the results of EIA is described in this document.

LOCATION OF PROJECT

LPG Storage and Refilling plant of M/s Heaven Gas (Pvt.) Limited is located at Chak No. 156/E.B, Link Road Burewala-Iqbal Nagar Road, Tehsil Burewala, District Vehari. Coordinates of site are 30.196098, 72.579691. Access to project site is provided Burewala Road.

NAME OF PROPONENT AND ORGANIZATION PREPARING THE REPORT

The details of the proponent are as follow:

Proponent Details	
Proponent Name	Muhammad Ijaz S/o Muhammad Aslam
Address	Gulshan e Farid Town, Chak No. 147/E.B, Post Office Arifwala, District Pakpattan

In order to comply with the regulatory requirement of environmental laws of Punjab, management of project has entrusted M/s EHS Services with the assignment of carrying out an EIA Study of the said project. The details of the consultant are as follows:

Consultant Details

Consultant	EHS Services Pvt. Ltd.
Address	House No.#12, Street No.#06, V-Lane Cavalry Ground Extension, Lahore Cantt
Focal Person	
Name	Engr. Muhammad Asif
Contact No.	0304-4404111, 0345-3122696

PROJECT OUTLINE

The main objective of the proposed project is to develop LPG gas refilling plant that will be in unison with the environment void of any conflict with the neighborhood. In order to achieve these goals, the objectives of the project are to –

- Construct a plant for manufacture of LPG refilling plant in accordance with local and international design standards
- Create employment professionally qualified individuals of operating the facility
- Ensure optimum sourcing of LPG in bulk for bottling and sale to the customers, and
- Maintain sound and high standards EHS management system while operating the plant.

In order to meet the desired goal and objectives, the facility will comprise the following primary features:

- Storage Tanks on RCC foundation
- Loading gantry
- Offices
- offloading points
- cylinder filling point
- LPG cylinders offloading zone
- Firefighting facilities

- Approved piping and pumping systems

Proposed Project	LPG storage & Refilling plant
Name of company	Heaven Gas (Pvt.) Limited
Coordinates of project	30.196098, 72.579691
Filling capacity	20 MT/Day
Storage capacity	100 MT
Total area of plot	117012 Sq. Ft
Cost of project	Approx. 40 million

MAJOR IMPACTS AND RECOMMENDED MITIGATION MEASURES:

Potential Positive impacts of the proposed project facility

The proposed project will have positive impacts to the society and the general environment. Some of the benefits include the following: -

1. Provision of a convenient LPG refilling facility
2. It will optimize use of the land; hence increasing its utility.
3. Increase economic investment hence increases in wealth which will translate in Government revenue increase.
4. The proponent will enjoy income generated through sale of products.
5. The project will also provide employment during both construction and operation phases.
6. It will create a market for goods and services, especially construction inputs which include raw materials, construction machinery.
7. Many secondary businesses are also likely to spring up during the operation phase especially those providing foods and beverages to the workers.

8. Increased competition for the provision of service, which might encourage price incentives by vendors leading to lower pricing of the products as well as increased quality of offered service.

Negative Impacts

Assessment of the Impacts during Construction

While the project's construction poses certain environmental risks, these are short term, and/or easily reversed. The major effects expected during the construction phase include: soil pollution caused by spillage from construction machinery; surface/ground water contamination as well as minimal levels of air and noise pollution. There is also expected to be an increase in the congestion of vehicular traffic and solid waste, however these negative impacts are short term. Positive impacts highlighted include the social benefits of migrant worker influx and the micro-economic development this will induce in the local area.

Mitigation Measures

- There shall be limited earthworks. Soil compaction and watering of loose soil shall be done on all disturbed areas during construction phase to minimize air pollution (by dust) and erosion by the agents of soil erosion.
- A management system for the control of vehicular emissions to be instituted.
- All loose material to be kept on site for the shortest possible time and provided with suitable covering.
- Waste, including soil debris shall be properly disposed of by backfilling and landscaping.
- Good working practices will be implemented to minimize noise and also reduce its impacts on human health (ear muffs, safe distances, enclosures).
- No machinery to be running when not required.
- All solid waste to be appropriately disposed of in drums or specified containers.
- No untreated discharge to be leaked to surface water, groundwater or soil.
- Care taken in disposing wastewater generated such that soil and groundwater resources are protected.

Assessment of the Impacts during Operation

During operational phase of the proposed project, no process wastewater will be generated except cleaning and sanitary waste. No Air emissions are expected during operational phase. Noise can be an issue due to operation of bowsers. The facility will create employment opportunities for skilled and non-skilled workers both during operation phase, thus generating wealth and livelihoods.

Mitigation Measure

- No untreated discharge will be leaked to surface water, groundwater or soil.
- Domestic wastewater will be treated in septic tank before discharge.
- Storage Tanks will be mounted on R.C.C foundation
- Gas detectors will be installed and emergency response system will be developed to cater any emergency
- Fire extinguishers and sand buckets will be placed at site for an emergency situation.
- Fire protection and safety measures will be adopted to take care of fire and exposure hazards, to be assessed and steps will be taken for their prevention.
- National Fire Protection Association USA (NFPA-58) standards will be followed to ensure safe operation of LPG storage tank.
- Keep the cylinder valves closed when not in use and fit and tighten the plug to the cylinder valve internal thread.
- Ensure that the cylinder is stored upright (vertical) at all times and is not at risk of tipping over.
- Inspect the cylinder on a regular basis to ensure it is in good condition, free from rust and housed properly.
- Store LPG away from the oxidizing gases (e.g. oxygen) by at least 3 meters.
- Do not store the cylinder in close proximity to an ignition source, or in locations that could jeopardise escape from the building in the event of a fire.
- Storage tanks will be constructed to modern specifications with secondary containment, impervious linings and leakage monitoring wells in place

ENVIRONMENTAL MANAGEMENT PLAN & PROPOSED MONITORING:

For effective implementation and management of mitigation measures, an Environmental Management Plan has been prepared. The EMP provides a delivery mechanism to address potential impacts of project activities, to enhance project benefits and to introduce standards of good practice in all project activities. The EMP has been prepared with the objective of:

- Defining legislative requirements, guidelines and best practices that apply to the project;
- Defining mitigation/ monitoring plan required for avoiding or minimizing potential impacts assessed by the EIA;
- Defining roles and responsibilities of the project proponent and the contractor;
- Defining requirements for environmental monitoring and reporting;
- Defining the mechanism with which training will be provided to the project personnel.
- Environmental sensitivities and impacts, as well as the associated mitigation plan have been addressed in the EMP.

An Environmental Management Plan (EMP) has been prepared and provided in report, providing:

- A systematic approach to ensure that mitigation strategies prepared in this EIA are implemented during project activities.
- An appropriate monitoring plan is devised to ensuring strict adherence to the environmental mitigation and control measures.
- A training program is devised to providing awareness training on all potential environmental issues of the project to all personnel at site.
- A waste management plan, identifying the most suitable waste disposal and pollution control options throughout the project lifecycle.

Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. During construction phase ambient air quality for dust level in particular, vehicle and equipment exhaust, noise level (tests), solid waste management and soil contamination, and community and workers' safety (visual) need to be monitored. During operation solid waste management and community and workers' safety (visual), gas detection system efficiency, generator exhaust needs to be monitored. **Plan has been included in Chapter 6**

CONCLUSION

The Environmental Impact Assessment contains description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. It is concluded in this study that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context. This report further draws the conclusion that the impacts identified are easily manageable and reversible, no long-term impact is expect and no deterioration or consequential depletion of local natural resources is expected. It is accordingly recommended that Environmental Approval for the project should be issued by the Punjab Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponents of the project.

Table of Contents

1	INTRODUCTION	15
1.1	GENERAL	15
1.2	OVERVIEW	15
1.3	IDENTIFICATION OF THE PROJECT AND PROPONENT.....	16
1.3.1	Nature of Project	16
1.3.2	Area/Size of project	16
1.3.3	Location of the Project.....	17
1.3.4	Proponent	17
1.4	DETAILS OF CONSULTANTS	17
1.5	PURPOSE OF REPORT.....	19
1.6	OBJECTIVES OF EIA.....	19
1.7	APPROACH & METHODOLOGY	20
1.7.1	Approach for EIA	20
1.7.2	Orientation	20
1.7.3	Desktop Studies	21
1.7.4	Review of Environmental Laws and Institutional Requirements	21
1.7.5	Delineation of Study Area / AOI	21
1.7.6	Survey of AOI.....	21
1.7.7	Environmental Baseline Survey of the Project	22
1.7.8	Stakeholder Consultations	22
1.7.9	Screening of Potential Environmental Impacts and Mitigation Measures.....	22
1.7.10	Environmental Management Plan (EMP).....	22
1.8	STRUCTURE OF REPORT	23
2	SCREENING	25
3	SCOPING	26
3.1	INTRODUCTION	26
3.2	OBJECTIVES	26
3.3	SPATIAL AND TEMPORAL BOUNDARIES OF ENVIRONMENTAL ASSESSMENT	26
3.4	IMPORTANT ISSUES AND CONCERN RAISED DURING CONSULTATION	26
3.5	SIGNIFICANT IMPACTS AND FACTORS TO BE DETERMINED.....	27
4	ALTERNATIVES.....	28
4.1	NO PROJECT OPTION (NPO).	28
4.1.1	Site Alternatives.....	28
4.1.2	Technology/Environment/Economic Alternative	29

5	PROJECT DESCRIPTION.....	33
5.1	OBJECTIVE OF THE PROJECT	33
5.2	LOCATION AND LAYOUT OF PROJECT	34
5.2.1	Location of the Project.....	34
5.3	LAND OWNERSHIP	34
5.4	GOVERNMENT APPROVALS	34
5.5	LAND USE ON SITE	35
5.6	ROAD ACCESS	35
5.7	RELOCATION AND REHABILITATION PLANS.....	35
5.8	VEGETATION FEATURES OF SITE	36
5.9	DESCRIPTION OF PROJECT	36
5.9.1	Raw Materials	36
5.9.2	Final Product.....	36
5.9.3	Capacity	36
5.9.4	Area of Project	36
5.9.5	Process Description.....	36
5.10	CONSTRUCTION DETAILS OF TANK:	39
5.11	SUPPLIES.....	40
5.11.1	Water supply	40
5.11.2	Electricity.....	40
5.11.3	Manpower	40
5.11.4	Firefighting	40
5.11.5	Health & Safety.....	41
5.11.6	Gas Detection System	41
5.12	SAFETY PLAN IN CASE OF LPG LEAKAGE	42
	What are the general requirements?.....	43
5.13	EMISSIONS AND EFFLUENTS	44
5.13.1	Wastewater.....	44
5.13.2	Air emissions	44
5.13.3	Noise	44
5.13.4	SOLID WASTE	45
5.14	COST AND MAGNITUDE OF OPERATION	45
5.15	SCHEDULE OF IMPLEMENTATION	46
6	DESCRIPTION OF THE ENVIRONMENT	47
6.1	GENERAL	47
6.2	PURPOSE OF BASELINE.....	47

6.3	STUDY AREA/ AOI	47
6.4	PHYSICAL ENVIRONMENT	48
6.4.1	Topography	48
6.4.2	Seismicity.....	49
6.4.3	Geography	49
6.4.4	Hydrology	50
6.4.5	Climate.....	50
6.5	BIOLOGICAL ENVIRONMENT	52
6.5.1	Flora	52
6.5.2	Fauna.....	52
6.5.3	Protected areas / National Sanctuaries	53
6.6	SOCIOECONOMIC BASELINE	53
6.6.1	Reconnaissance Field visit.....	53
6.6.2	Data Collection and Field Survey	53
6.6.3	Community/Stakeholders' Participation	54
6.6.4	Population	54
6.6.5	Religion.....	54
6.6.6	Language.....	54
6.6.7	Agriculture	55
6.6.8	Industries.....	55
6.6.9	Educational Facilities.....	56
6.6.10	Gender Situation Analysis	57
6.6.11	Social and Cultural Values.....	58
6.6.12	Conflict Resolution Mechanism	58
6.6.13	Health Facilities	58
6.6.14	Means of Transportation	59
6.7	LAB REPORTS OF ENVIRONMENTAL ANALYSIS	59
6.8	SITE SUITABILITY	59
7	IMPACT ASSESSMENT.....	60
7.1	GENERAL	60
7.2	NOTION OF SIGNIFICANCE / CHARACTERISTICS OF IMPACTS	60
7.3	METHODOLOGY FOR IMPACT EVALUATION	61
8	POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES 64	
8.1	GENERAL	64
8.2	SCREENING OF POTENTIAL IMPACTS	64
8.3	IMPACTS DUE TO PROJECT LOCATION	65
8.3.1	Relocation of People	65

8.3.2	Loss of Vegetation	65
8.3.3	Shifting of Utilities	65
8.3.4	Impact on Archaeological/Cultural Property	65
8.4	IMPACTS DUE TO PROJECT DESIGN	65
8.5	IMPACTS DURING CONSTRUCTION PHASE.....	66
8.6	IMPACTS DURING OPERATIONAL PHASE.....	70
8.6.1	Spills during Fuel Transfer	70
8.6.2	Solid Waste Management	71
8.6.3	Wastewater.....	71
8.6.4	Air pollution.....	71
8.6.5	Noise and Vibration	72
8.6.6	Traffic management	72
8.6.7	Emergency Response	72
8.6.8	Safety Concerns	73
8.7	POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES	74
8.7.1	Employment/Poverty Alleviation	74
8.7.2	Increased Business Opportunities	74
8.7.3	Tree Plantation	74
9	ENVIRONMENTAL MANAGEMENT & MONITORING PLAN.....	75
9.1	GENERAL	75
9.2	ENVIRONMENTAL MONITORING PLAN	80
9.3	REPORTING AND REVIEWING PROCEDURES (COMMUNICATION AND DOCUMENTATION).....	83
9.4	ROLES AND RESPONSIBILITIES OFF ENVIRONMENT MANAGEMENT TEAM	84
9.4.1	Proponent	84
9.4.2	Contractor	84
9.4.3	EIA/IEE Expert.....	85
9.5	ENVIRONMENTAL TRAINING.....	85
9.6	SCHEDULE FOR IMPLEMENTATION & ENVIRONMENTAL BUDGET	86
10	SOCIOECONOMIC SURVEY AND PUBLIC CONSULTATION	87
10.1	OBJECTIVES OF CONSULTATION	87
10.2	IDENTIFICATION OF STAKEHOLDERS	88
☐	Direct.....	88
☐	Indirect	88
10.3	PUBLIC DISCLOSURE	88
10.4	CONSULTATION PROCESS	89

10.4.1	Consultation Methodology.....	89
10.4.2	Consultation Material.....	89
10.4.3	Consultation Mechanism	90
10.5	PRIMARY STAKEHOLDERS CONSULTATION.....	90
10.5.1	Stakeholder Concerns and Recommendations.....	90
10.6	SECONDARY STAKEHOLDERS CONSULTATION	92
11	CONCLUSION AND RECOMMENDATIONS	94
11.1	CONCLUSION.....	94
11.2	RECOMMENDATIONS	94

LIST OF FIGURES

Figure 4-1: Sensitive Receptors near Project site	32
Figure 5-1: Process Schematic Diagram.....	39
Figure 6-1: Location Map of District Vehari.....	49
Figure 6-2: Seismic Zoning	49
Figure 6-3: Avg Temp in Vehari	51
Figure 6-4: Avg Rainfall in Vehari.....	51
Figure 6-5: Relative Humidity in Vehari.....	51
Figure 6-6: Average Windspeed in Vehari	52
Figure 6-7: Industries in Project Area.....	56
Figure 6-8: Education Institutes in Project Area.....	57
Figure 6-9: Health Facilities in Project Area	58

LIST OF TABLES

Table 1-1: List of Experts	18
Table 4-1: Vehari Languages.....	55
Table 4-2: Industries in Vehari	55
Table 4-3: Education Facilities in Vehari	57
Table 7-1: Impact Significance Criteria.....	61
Table 7-2: Impact Screening Checklist (Construction Phase)	62
Table 7-3: Impact Screening Checklist (Operational Phase).....	62
Table 7-4: Impact Assessment (Construction Phase)	63
Table 7-5: Impact Assessment (Operational Phase)	63
Table 9-1: EMP for construction phase	75
Table 9-2: EMP for Operation Phase.....	77
Table 9-3: Schedule for Implementation & Environmental budget.....	86

LIST OF ANNEXURES

- Annexure I:** Proponent CNIC
- Annexure II:** Land/Property Documents
- Annexure III:** Site & Layout Map of Project
- Annexure IV:** Approvals
- Annexure V:** Environmental Monitoring Reports
- Annexure VI:** Glossary
- Annexure VII:** List of Abbreviations
- Annexure VIII:** TORs
- Annexure IX:** List of Experts
- Annexure X:** References
- Annexure XI:** List of Individuals and Organizations Consulted

1 INTRODUCTION

1.1 GENERAL

This chapter includes the data relevant to the undertaking of the Environmental Impact Assessment (EIA) and details of the project title, project proponent, Consultants, the rationale of the project and the approach taken to the EIA study.

1.2 OVERVIEW

Liquefied Petroleum Gas (LPG) is a colourless, odourless and environment friendly mixture of hydrocarbons (mainly propane and butane) which is gaseous at normal temperature and pressure, and liquefiable under reduced temperature or moderate pressure. A chemical ethyl mercaptan is added to impart a pungent odour for leak detection. Currently about 1000 tons/day LPG is being produced domestically contributing less than 1% to the total energy supply mix. Because of its characteristics LPG is fast becoming a fuel of choice in the areas, where natural gas distribution network is not available. Currently out of 27 million households in Pakistan, 6.1 million are connected to natural gas network and the rest are relying on LPG and conventional fuels like coal, firewood, kerosene, dung cake etc. which indicate the strong demand for Liquefied Petroleum Gas (LPG) sector.

Liquefied Petroleum Gas (LPG) is used as fuel for cooking and heating in the northern Pakistan. It is also used as fuel in vehicles particularly taxi and rickshaws. More than 30,000 rickshaws and taxis in Karachi and other parts of the country are run on LPG. The demand of LPG in Karachi is consistent throughout the year and increases during winters in Punjab and Northern Pakistan.

Although demand of LPG is persistent throughout the year, supply of LPG from producers (or extractors) to distributors and marketing companies has been limited due to maintenance and overhauling shutdowns, which often creates shortages. Besides that, LPG producers are also limited in numbers and LPG marketing companies need to have a quota of gas to be allocated by the producer. This factor makes LPG business vulnerable in the hands of LPG producers.

LPG (Liquefied Petroleum Gas) is the generic name for commercial propane and commercial butane. These are hydrocarbon products produced by the oil and gas industries. Commercial Propane predominantly consists of hydrocarbons containing three carbon atoms, mainly

propane (C₃H₈). Commercial Butane predominantly consists of hydrocarbons containing four carbon atoms, mainly n- and iso – butanes (C₄H₁₀). They have the special property of becoming liquid at atmospheric temperature if moderately compressed, and reverting to gases when the pressure is sufficiently reduced. Advantage is taken of this property to transport and store these products.

For any project to be initiated in Punjab, it is mandatory to accord Environmental Approval from EPA Punjab under Section-12 of the Punjab Environmental Protection (Amendment) Act, 2012 by filing an IEE or EIA before EPA Punjab, as may be defined in Review of IEE/EIA Regulations, 2022 or recommended by EPA Punjab. For this purpose, the proponent has decided to engage environmental consultants, **M/S EHS Services** to conduct Environmental Assessment for the execution of project. The purpose of this study is to identify the environmental baseline i.e. physical, biological and socio-economic/cultural conditions and assess all possible impacts arising during the construction and operation phase of the project and to find out appropriate measures for their mitigation, to either eliminate those impacts or to bring them to acceptable level and formulation of Environmental Management Plan (EMP) for implementation of the project in environment friendly manner. This report is prepared by critically examining of the environmental factors which might be affected due to construction and operation of the project. The purpose of this report is to analyze impacts of the project. This EIA provides the basis for a determination of the degree of the environmental impacts of the project. The report provides relevant information, as required under the officially approved format, to help the decision makers i.e. EIA Punjab before issuing for the Environmental Approval.

1.3 IDENTIFICATION OF THE PROJECT AND PROPONENT

1.3.1 Nature of Project

The Environmental Impact Assessment (EIA) report covers the project “Installation of LPG Storage & Filling plant”. The salient features of this project have been described in Chapter 3, and briefly in Executive Summary of EIA.

1.3.2 Area/Size of project

Total area of project is 117012sft.

1.3.3 Location of the Project

Aforesaid project is to be located at Chak No. 156/E.B, Link Road Burewala-Iqbal Nagar Road, Tehsil Burewala, District Vehari.

1.3.4 Proponent

The details of the proponent are as follow:

Proponent Details	
Proponent Name	Muhammad Ijaz s/o Muhammad Aslam
Address	Gulshan e Farid Town, Chak No. 147/E.B, Post Office Arifwala, District Pakpattan

1.4 DETAILS OF CONSULTANTS

For the preparation of the EIA Report of the said project, the proponent has hired the services of the environmental consultants; **M/S EHS Services**. Team comprising of environmental engineers, chemical engineers, environmental experts and environmentalists has worked on this report. EHS Services is one of the pioneers Environmental Consultancy Companies in Pakistan with an unrivalled reputation for providing expert, tailored services and solutions. EHS Services provides the environmental services, litigation and consultancy to clients both industry and government.

EHS Services is providing quality services in various environmental sectors i.e.

- Environmental Assessment Reports i.e. IEE/EIA
- Environment Management Plans (EMP)
- Designing of Emission Control Equipment
- Waste Water Treatment Plant (WWTP) Designing
- WWTP Construction Supervision, Commissioning and Operations
- Establishing Bottled Water Plant based on RO or UF

- Lab testing (Drinking Water & Waste Water Analysis , Soil Analysis, Sludge Testing, Petroleum/ Lube Oil Testing, Fertilizer Analysis, Pesticides in Water, Soil, Fertilizer, Coal, Coke Analysis)
- Monitoring and inspection
- Environmental modeling

Consultant Details	
Consultant	EHS Services Pvt. Ltd.
Address	House No.#12, Street No.#06, V-Lane Cavalry Ground Extension, Lahore Cantt
Focal Person	
Name	Engr. Muhammad Asif
Contact No.	0304-4404111, 0345-3122696

Study team:

The following table lists the names of experts involved in the making of EIA report:

Table 1-1: List of Experts

Sr. #	Name	Qualification	Role
Engineers			
i.	Engr. M. Asif	M.Sc. Chemical Engineering	Monitoring and Testing
ii.	Engr. Muzna Manzoor	M.Sc. Environmental Engineering	Designing and report review
iii.	Engr. Fahad Nazir	M.Sc. Chemical Engineering	Socioeconomic Survey

iv.	Engr. Rida Azhar	B.Sc. Environmental Engineering	Report preparation
v.	Mahtab Alam	M.Sc. Chemical Engineering	Collection of baseline data
vi.	Saad Khattak	B.Sc. Chemical Engineering	Site survey and analysis of impacts on surroundings

1.5 PURPOSE OF REPORT

The establishment/development/construction of any Project leads to positive and adverse changes in environmental and change in social settings of the Project Area. The intensity and level of change, however, depends upon the nature of the Project and the baseline environmental conditions of the area. The construction of said project will cause minor to moderate adverse environmental and social impacts on the surrounding area. Thus, an environmental and social study is mandatory to establish the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures.

Section 12 of Pakistan Environmental Protection Act, 1997 (PEPA, 1997) states “No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Initial Environmental Examination (IEE) and, where the project is likely to cause an adverse environmental effect, an Environmental Impact Assessment (EIA), and has obtained approval from the Provincial Agency in respect thereof.” Later on, Punjab Environmental Protection Agency (Review of IEE and EIA) Regulations, 2022 provided the guidelines for categorizing the Projects. According to Schedule-II of PEPA (Review of IEE and EIA) Regulations, 2022; the construction of the said project falls under category A(5). i.e., the project requires an EIA study.

1.6 OBJECTIVES OF EIA

The main objectives of this EIA study were:

- ✓ To determine and document the state of the environment of the project area to establish a baseline in order to assess the suitability of the said project in that area.
- ✓ To identify pre-construction, construction and operation activities and to assess their impacts on environment.
- ✓ Provide assistance to the proponent for planning, designing and implementing the project in a way that would strengthen environment, improve ecological resilience, eliminate or minimize the negative impact on the biophysical and socio-economic environment and maximizing the benefits to all parties in cost effective manner.
- ✓ To present Mitigation and Monitoring Plan to smoothly implement the suggested mitigation measures and supervise their efficiency and effectiveness.
- ✓ To provide opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development.
- ✓ Prepare an EIA Report for submittal to the Environmental Protection Agency, Punjab for according Environmental Approval.

1.7 APPROACH & METHODOLOGY

The following approach and methodology was adopted for carrying out the EIA study of the proposed project:

1.7.1 Approach for EIA

The approach for conducting EIA of said Project is to follow the requirement of Punjab Environmental Protection Act 1997, Initial Environmental Examination and Environmental Impact Assessment Review Regulations 2022 and the guidelines provided in the Pakistan Environmental Assessment Procedures, 1997

1.7.2 Orientation

Meetings and discussions were held among the members of the EIA Consulting Team. This activity was aimed at achieving a common ground of understanding of various issues of the study. Subsequent to the concept clarification and understanding, a detailed data acquisition plan was developed for the internal use of the EIA consulting team. The plan identified specific

data requirements and their sources; determined time schedules and responsibilities for their collection; and indicated the logistics and facilitation needs for the execution of the data acquisition plan.

1.7.3 Desktop Studies

Prior to mobilization, the consultants conducted a desktop study through collection and review of guidelines, data and reports related to the proposed project, that included (a) review of National and Provincial Environmental Legislations; (b) Google Earth Satellite Imagery; (c) and other relevant documents/drawings and design data provided by the Client.

1.7.4 Review of Environmental Laws and Institutional Requirements

All applicable national and international laws, legislations, guidelines along with relevant international protocols were reviewed relevant to the proposed project components.

1.7.5 Delineation of Study Area / AOI

For an EIA Study, a clear delineation of the Study Area / Area of Influence (AOI) is required. Study Area / AOI is the area within which the potentially significant impacts of the proposed Project activities (direct or indirect) are envisaged. In this report, the Study Area / AOI is the area where the Project impacts has been accessed on the environment due to the proposed Project activities. Based on the available Google Earth Imagery, Project footprints were overlaid on the existing Project Area Imagery. Utilizing the information collected through the detailed site visit, consultations with the locals and concerned departments and foreseen impacts of the proposed Project, a tentative AOI was delineated.

1.7.6 Survey of AOI

A team of Environmental Scientists, Environmental Engineers and Sociologist carried out the environmental and social survey of the AOI to familiarize themselves with the local conditions and the environmental settings. During the survey, the information regarding the topography, soils, surface water, groundwater, flora & fauna, social settings and major settlements along the AOI were observed.

1.7.7 Environmental Baseline Survey of the Project

Detailed environmental and social survey was carried out within the AOI as mentioned above. For data collection, formal meetings were held and data collected through visual observations, interviews with the local residents and officials. In order to collect the relevant published information, government offices were also visited. Prior to the start of field activities comprehensive checklists, proformas and maps were developed to collect the information

1.7.8 Stakeholder Consultations

The Consultant identified Project stakeholders and held meetings with them during the surveys to receive feedback on the expected environmental issues related to the Project and suggested mitigation measures. Meetings were carried out with stakeholders to discuss the issues/constraints and get their views and feedback to mitigate the potential environmental as well as social impacts associated with the implementation and operation of the Project.

1.7.9 Screening of Potential Environmental Impacts and Mitigation Measures

Based on the generally established baseline conditions in the adjacent as well as in the Project Area, potential physical, ecological and social impacts of the proposed Project were identified, evaluated and quantified, wherever possible. A logical and systematic approach was adopted for impact identification and assessment by utilizing a combination of the secondary data, satellite imagery, environmental checklists, socioeconomic survey proformas, field observations and discussion with the local residents of the Project Area. To mitigate the significant adverse impacts, adequate mitigation measures and implementation framework were proposed so that the proponent could incorporate them beforehand in the design phase.

1.7.10 Environmental Management Plan (EMP)

An EMP has been prepared to ensure the adequacy and effectiveness of the proposed protocol by clearly identifying the roles and responsibilities of the agencies, responsible for implementation, monitoring and auditing of EMP activities, existing and suggested framework, necessary approvals and the required further studies. EMP also include organizational setup, a monitoring mechanism, monitoring plan, environmental and social parameters to be monitored with their frequency. Similarly, costs for environmental monitoring and social

component/social mitigation measures were also included as part of the EMP. Environmental monitoring, evaluation, auditing and reporting mechanisms were also proposed in the EMP.

1.8 STRUCTURE OF REPORT

This EIA reviews information on existing environmental attributes of the Study Area. Geological, hydrological and ecological features, air quality, noise, water quality, soils, social and economic aspects and cultural resources are included. The report predicts the probable impacts on the environment due to the said project. This EIA also proposes various environmental management measures. Details of all background environmental quality, environmental impact/pollutant generating activities, pollution sources, predicted environmental quality and related aspects have been provided in this report. The structure of the assessment report will be as follow;

Section 1 “Introduction” briefly presents the project background, objectives, methodology and need of the EIA study.

Section 2 “Description of Project and Alternative” furnishes information about the studied alternatives, location of the proposed project, cost and size of the project, its major components and alternatives considered for the proposed project to select at the preferred alternative for detailed environmental assessment.

Section 3 “Environmental Baseline” describes physical, biological and socio-economic conditions prevalent in the project area.

Section 4 “Anticipated Environmental Impacts and Mitigation Measures” identifies and evaluates impacts of the project activities during the construction and operation stages and recommends with the measures proposed to mitigate potential environmental impacts of the project.

Section 5 “Environmental Management Plan” outlines roles and responsibilities for the implementation of the proposed mitigation measures, training needs of the staff for implementation of the mitigation measures, monitoring requirements, monitoring cost etc.

Section 6 “Public Consultation” identifies the main stakeholders and their concerns raised through scoping sessions, and deals with the measures to mitigate the social impacts.

Section 7 “Conclusion and Recommendations” elaborates the conclusion of subject environmental study and suggests the recommendations to address the issues raised from proposed construction activities.

2 SCREENING

According to the Section 12 of Punjab Environmental Protection Act, 1997 (amended 2012) which states;

“No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be or where the project is likely to cause an adverse environmental effect an Environmental Impact Assessment (IEE) and has obtained from the Government Agency approval in respect thereof.”

As per the statutory notification of Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022 made under Section 12 of Punjab Environmental Protection Act, 1997 (Amended 2012), the project for the Installation of LPG Storage and Refilling Plant falls under **Schedule II** (List of projects requiring an EIA), A (5) category i-e Oil and gas extraction projects including exploration, production, gathering systems, separation and **storage**

For this instance, Environmental Impact Assessment of the Project has been conducted in accordance with the Punjab Environmental Protection (Amendment) Act, 2012 and IEE/EIA Regulations 2022.

3 SCOPING

3.1 Introduction

The scoping identifies the key issues and impacts that should be further investigated. The Scoping defines the spatial and temporal boundaries, important issues and concerns raised during consultation and significant impact factors to be determined.

3.2 Objectives

The key objectives of this scoping are to:

- ✓ Inform the public about the proposed project
- ✓ Identify main stakeholders and their concerns and values
- ✓ Define reasonable and practical alternatives to be addressed
- ✓ Focus the important issues and significant impacts to be addressed in the EIA report
- ✓ Define the boundaries in time, space and subject matter
- ✓ Set requirements for the collection of baseline and other information
- ✓ Establish the Terms of Reference (TOR's) for the EIA study

3.3 Spatial and Temporal Boundaries of Environmental Assessment

Construction of said project will be completed in 1 year. Operation Lifespan will be till 2050. Said project will have positive and negative impacts at local and national level. Most of the Project's environmental and social impacts will be beneficial, including for example the availability of environment friendly LPG refilling facility locally. Positive changes in lifestyles will occur due to availability of income when the natives take up jobs.

3.4 Important issues and concern raised during consultation

During consultation it was observed that maximum of people was in favour of project and following issues and concerns were raised during Stakeholder Consultation:

- Proper emergency response plan should be developed
- Loading and loading vehicles should be avoid during busy hours to avoid traffic congestion
- Air and noise emissions should be controlled during construction

3.5 Significant impacts and factors to be determined

Main impacts and factors to be determined are;

- Occupational Health and safety
- Traffic Management
- Community disturbance
- Control Air emissions
- Job opportunities for locals
- Confined noisy activities
- Resource conservation
- Avoid excessive water consumption
- Energy efficient techniques must be adopted
- Proper site restoration after construction
- Emergency preparedness

4 ALTERNATIVES

This chapter deals with an analytical overview of the different alternatives that have been considered while planning of the proposed project. The analysis has been carried out critically so as to justify the need of the Project. The following alternatives considered during the conduct of the study are given as below:

- No Project Option (NPO).
- Location/Site Alternatives, their selection and rejection criteria.
- Design/Technology alternatives, their selection and rejection criteria.
- Environmental Alternatives, their selection and rejection criteria.
- Economic Alternatives, their selection and rejection criteria.

4.1 No Project Option (NPO).

The project is meant to stimulate economic and social development of the area through meeting the high demand of petroleum products in the country and also to meet proponent's economic desires. The project area is along a main road/highway therefore suitable for such project hence there will be no land-use conflict. The “No Project” alternative implies that no development will be undertaken on the land and thus retains the original environment. Without the project the land would not be put into optimum use. Although the “no project” alternative would not have adverse impacts on the environment, it does not make economic sense not to undertake the development.

4.1.1 Site Alternatives

An open land under undisputed ownership is selected for the Establishment of storage and filling plant. Selected site is an unproductive land and is going to be brought into commercial use which will be beneficial for the locals as they will get jobs. The site is well located in regard to the following:

- Easy road access to the market
- No settlements at a safe distance
- No watercourse within a safe distance
- No ecologically sensitive or declared protected area in safe radius

Distances (areal distances) of receptors from site are:

Receptors	Name	Distance
School	Govt Primary School Dallan Banglow	1.02km
Residence	Chak 156E.B	0.91km
Hospital	Afzal Medical Complex	1.2km
Industry	A & H Pharmaceutical	2.3km
Road	Burewala Road	0.4km

Distance of nearest Receptors from project site is shown in fig 4-1

4.1.2 Technology/Environment/Economic Alternative

LPG is well positioned to assist developing countries in the transition to modern fuels for the following reasons:

1. Availability: There is nothing exotic to invent or improve. The transportation system that moves it is in place, the tank to store it is available, and the appliances and equipment that provide heat and power are “on the shelf”.
2. Infinite shelf Life: LPG does not deteriorate over time unlike some other liquid fuels that gel, stratify or evaporate and must be protected from weather to prevent deterioration.
3. High energy density: Compared to traditional fuels in terms of weight equivalency, LPG has ten times energy.
4. Environment friendly: It burns cleanly without smoke or residual ash, thus avoiding the health hazards associated with indoor use of traditional fuels in the event of a leak, LPG doesn't contaminate the soil or aquifers.
5. LP Gas can be transported, stored, and used virtually anywhere in the world. It does not require a fixed network and does not deteriorate over time.
6. LP Gas is very clean burning and has lower greenhouse gas emissions than any other fossil fuel when measured on a total fuel cycle.
7. LP Gas is cost-effective, since a high proportion of its energy content is converted into heat. LP Gas can be up to five times more efficient than traditional fuels, resulting in less energy wastage and better use of energy resources.

The practical, operational and environmental characteristics of all four commercially available fuels are summarized in the following Table

FUEL CHARACTERISTICS

Fuel Characteristic	Petrol	Diesel	CNG	LPG
Urban Air Pollution	Moderate to low emissions of hydrocarbons (HC) and Oxides of Nitrogen (NOx). Low particle (PM) emissions.	High NOx, low HC emissions. High PM emissions relative to other fuels even with reduced sulphur levels. By far the highest adverse impact on public health.	HC (methane) emissions can be high. Moderate to low NOx. Very low PM.	Low NOx and moderate to low HC emissions. Very low PM.
Global Warming (Greenhouse)	Moderate CO ₂ , low methane (CH ₄) emissions. Some questions re nitrous oxide (N ₂ O) formation in the catalyst.	Lower CO ₂ , low CH ₄ and HC. Airborne PM may increase global warming. High NOx levels may result in elevated N ₂ O emissions.	Potentially lowest CO ₂ of all fuels, but this can be offset by the very high greenhouse impact of methane (CH ₄) emissions from these engines.	Tailpipe CO ₂ levels lie between petrol and diesel. Lifecycle CO ₂ comparable to diesel, lower than petrol and CNG. Negligible CH ₄ emissions.
Engine Noise	Low	High	Low	Low

Application	Lowest cost fuel system, so attractive for cars and light commercials.	Complex high pressure fuel system increases cost, but most fuel efficient. Very durable and reliable in heavy duty applications.	High cost and limited range Preclude use in light duty vehicles and in areas where there is no pipeline gas. Use effectively limited to places where high pressure natural gas pipeline exists	Cost, range and on road performance equivalent to petrol in light duty vehicles. Engines now available for buses and medium trucks. Not constrained to depot-based operations.
Retail Availability	Nationally Available	Nationally Available	Limited	Nationally Available

LPG has many technology advantages over other fuels, it is a cheaper and green fuel hence it would be a better choice for use.



Figure 4-1: Sensitive Receptors near Project site

5 PROJECT DESCRIPTION

This section of the study renders a detailed account of the project and its salient features, such as location and various phases. Inputs and discharges relevant to different phases of the project, such as electricity & material have also been examined as a response to possible environmental concerns.

5.1 OBJECTIVE OF THE PROJECT

The objective of the project is to construct and operate LPG Storage and Filling Plant in an environment friendly manner.

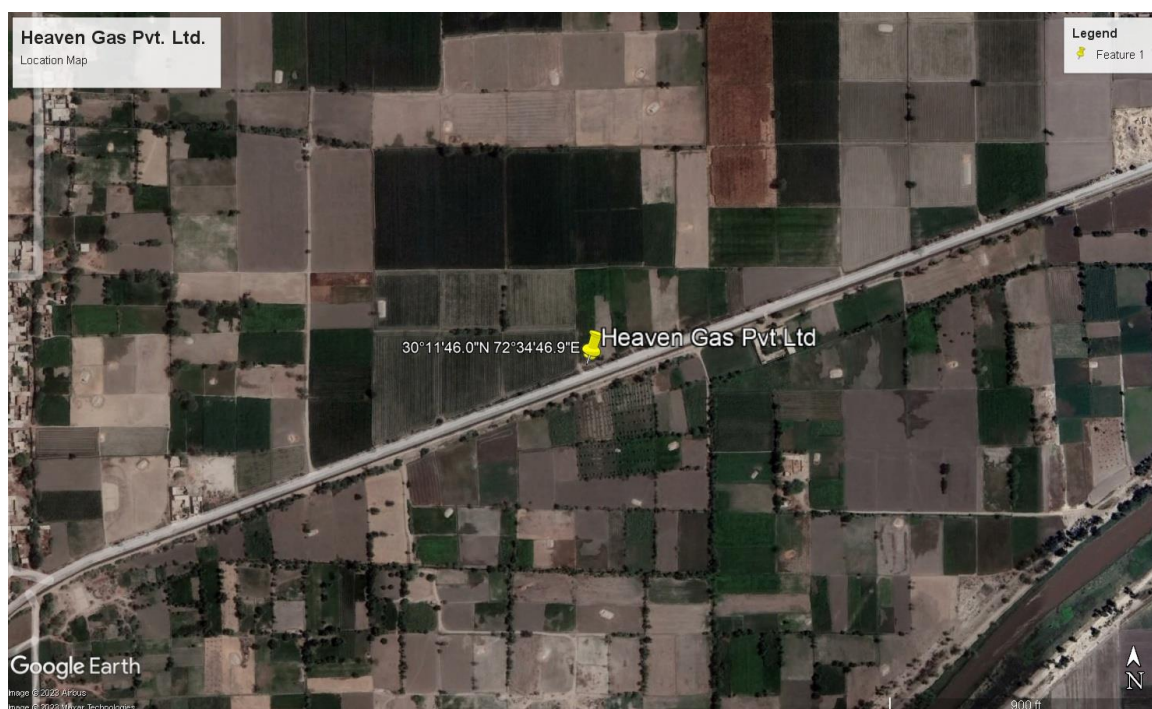
The objectives of the proposed Project are as following;

- Storage and filling of LPG in cylinders with ensuring safe conditions
- To provide LPG 24 hours to provide best services to customers
- To provide LPG in adequate price as compared to market
- To provide the employment to the people
- To change the social life style of the workers
- To upgrade the socio-economic condition of the area
- Reduce automotive pollution through cleaner and environment friendly fuel.
- Overcome the scarcity of bulk LPG due to huge gap between demand and supply.

5.2 LOCATION AND LAYOUT OF PROJECT

5.2.1 Location of the Project

Particulars	Details
Latitude	30°11'46.0"N
longitude	72°34'46.9"E
location	Chak No. 156/E.B, Link Road Burewala-Iqbal Nagar Road, Tehsil Burewala, District Vehari
Tehsil	Burewala
District	Vehari
Road connectivity	Burewala Road



5.3 LAND OWNERSHIP

Land/property documents are attached in Annexure II.

5.4 GOVERNMENT APPROVALS

Following NOCs are obtained and annexed:

- License from OGRA is attached in report (**Annexure IV**).

5.5 LAND USE ON SITE

Site is surrounded by open lands and agricultural lands. The land is owned by proponent. The land use on the site will be commercial only. The site will be used for the installation of LPG storage and filling plant. There is no settlement, surface water body, grassland or preserved area in the proximity of the project area that could be damaged or dismantled

5.6 ROAD ACCESS

Main roads and markets are in easy and close access of the proposed project site. Said project site is easily accessible through Burewala road. Road Network around project site is shown in below fig:



5.7 RELOCATION AND REHABILITATION PLANS

The main areas to be considered for site restoration include the construction area, temporary tracks; land used for vehicle and material stores, material excavation pits etc. These areas should be restored to its original condition with the maximum possible effort. The restoration work comprises the removal of temporary construction works and removal of any fence installed, leveling of areas (wherever required), etc. The following procedures will be adopted for the restoration of the site:

- All temporary construction built for the site development will be removed.
- Any debris from construction activities should be removed properly from the site.
- All fencing and gates will be removed and pits will be backfilled.

- Whole of the site will be covered with the original soil to the original levels and grades and re-vegetation will be done, where required.

None of the locals or residents will be relocated or infrastructure will be affected or destructed because land is already under the ownership of the project owner. There is no need for the relocation or dismantling of significant structure. Hence, no relocation and rehabilitation is required.

5.8 VEGETATION FEATURES OF SITE

The project area is surrounded by green areas and open lands. Site is vacant, only some shrubs are present.

5.9 DESCRIPTION OF PROJECT

5.9.1 Raw Materials

The major raw material for the plant is LPG which will be transported in tankers to the plant, maintaining safety standards.

5.9.2 Final Product

The plant is proposed for storage and bottling of LPG. Nothing will be produced in plant premises. LPG will come as raw material and will be filled in to LPG cylinders and dispatched to domestic market.

5.9.3 Capacity

The project envisages at construction of storage and filling station which will have a filling capacity of 20MT/Day. Storage capacity will be 100MT.

5.9.4 Area of Project

Total Area of the Project is 117012 Sq. Ft.

5.9.5 Process Description

The LPG Marketing Terminal project broadly consists of the following:

- Storage Tanks
- LPG Pump
- Tank lorry decantation shed
- LPG compressor

- Fire and gas detection system
- LPG Bottling Shed
- Evacuation of Leaky Cylinders
- Storage of Filled Cylinders & Transportation
- Truck Parking and Movement

LPG is transported from production installation to the storage and filling plant where LPG is stored in tanks and filled into cylinders for storage and distribution for various purposes. Transfer operation of LPG is very critical, as LPG is a highly inflammable product and the systems are required to be intrinsically safe. The systems also require very comprehensive fire safety arrangements.

5.9.5.1 Filling of Storage Tanks:

LPG tankers will arrive on site and enter through main gate of plant. Tanker will be attached to the bowser point and LPG will be transferred from Mobile tanker to storage tank of capacity 100MT. Dyke wall of 2'-0" height will be provided with LPG tank. Storage tank will be mounted on RCC foundation. LPG Storage and Bottling plant will be designed as per NFPA-58 and OGRA 13(3) of LPG Production and Distribution Rules 2001. The filling station will be supplied with emergency and fire fighting equipments to be used in case of fire emergencies.

5.9.5.2 Transfer of LPG to Filling Station:

LPG pump is used to transfer LPG from storage tank to transfer station via transfer pipes. Transfer pipes are provided with fire water lines in case of emergency fires.

5.9.5.3 Visual inspection/ Segregation of cylinders:

Before the LPG cylinders are filled, a pre-fill inspection of the cylinders will be undertaken to ensure that the cylinders are safe to fill. The cylinders that are found to be in good condition will be filled, sealed, weighed and taken back to the factory. Cylinders found unfit for filling on visual inspection e.g heavily rusted or heavily dented will be separated during visual inspection. Cylinders having twisted valve spindle, broken/bent foot protection ring would also be segregated.

5.9.5.4 Cylinder Filling:

Valve protection cap will be removed and cylinder is filled at filling station. The filling process will take place in the cylinder filling area. The plant's filling stock management system will be fully computerized. This will ensure that every single cylinder will be filled thoroughly and that instances such as over-filling, under-filling, and leakages do not occur.

5.9.5.5 Final Inspection:

Cylinders are visually inspected to examine their sound condition and presence of valve protection.

5.9.5.6 Storage and Delivery of filled Cylinders:

At this stage cylinders are ready for storage and delivery. If required, the fit cylinders can be directly sent to the trucks for loading or the cylinders are sent for stacking in the area earmarked for purpose.

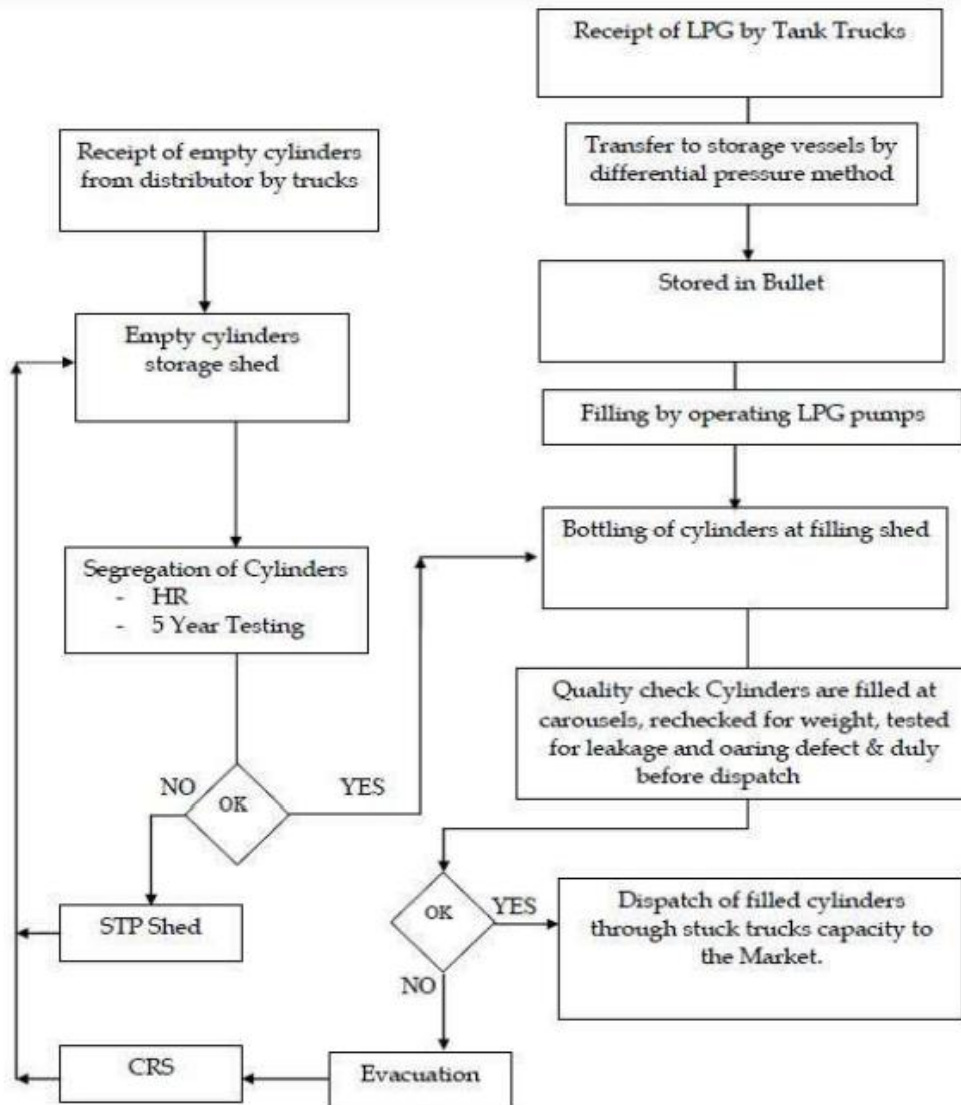


Figure 5-1: Process Schematic Diagram

5.10 CONSTRUCTION DETAILS OF TANK:

Following construction rules will be followed:

- Tank for the storage of Liquefied Petroleum Gas shall be designed for a working pressure corresponding to the vapour pressure at the highest temperature that the tank is likely to reach.
- Storage tank shall be fitted with a pressure gauge and devices for measuring the liquid content and its temperature. The maximum quantity of Liquefied Petroleum Gas filled into tank should be such that at the maximum operating temperature it would not occupy more than 95% of the capacity of the storage tank.
- Excess flow valves shall be fitted to prevent the loss of LPG from storage tank.

- Remote controlled hydraulically operated shut-off valves shall be fitted to each storage tank.

Design Code	ASME SEC VIII. DIV 1
Capacity	50MTons
Design pressure	250 psig
Design Temp	66 ° F
Hydrostatic test	2240kpa
Specific gravity	0.55
Corrosion allowance	1mm
Radiography	100%

5.11 SUPPLIES

5.11.1 Water supply

The surplus water during the construction phase of the whole project will be estimated to meet any unforeseen situation. The water demand will be fulfilled from ground water. Water requirement for maintenance of green belts will be done on daily basis by ground water through pumps and pipes to avoid wastage of water. The water requirement for the construction phase will be 2000 gal/day while during operational phase water requirement will be 800 l/day.

5.11.2 Electricity

Source of power will be WAPDA and a diesel fired generator of 50KV_a.

5.11.3 Manpower

A total of 8-10 employees including mechanical, electrical, operators, sweepers and other managerial and office staff shall be working at project site.

5.11.4 Firefighting

The facility will have a comprehensive firefighting system covering all hazardous areas and the other areas of the facility. This ensures that any fire within the plant is quickly surpassed and extinguished. Firefighting and emergency catering facilities will include:

Firefighting Requirements

Fire hydrant	4
Sand buckets	12
Trolley mounted Fire extinguisher	4
Earth conductor	10
Fire extinguisher	10
Emergency shutdown	2
Water sprinkler	3
Fire monitor	4
Gas detector	3
Fire alarm	2

5.11.5 Health & Safety

For health and safety of workers, 4 first Aid Boxes will be available and workers will be provided with following PPEs

Sr. #	PPEs	Qty.
1	Gloves	10 Pairs
2	Shoes	10 Pairs
3	Mask	10 Pairs
4	Anti-fire suits	10 Suits

5.11.6 Gas Detection System

A gas detection system with adequate number of detector heads at different locations shall be provided for the LPG filling station. Gas detectors will be provided to detect any leakage. The system should give audible alarm when detecting LPG at a concentration 20% of the lower flammable limit and give direct signal to fire services Communication Centre when detecting LPG at a concentration 40% of the Lower flammable limit. Each detector head should be able to be isolated individually for the purpose of maintenance and testing.

5.12 SAFETY PLAN IN CASE OF LPG LEAKAGE

What are the risks associated with an LPG leak?

LPG contains gas, which, under pressure is highly flammable. There could be two main kinds of health hazards associated with a gas leak –

Hazard#1: Those occurring due to inhalation of the gas

If inhaled, it can displace air, deprive your lungs of oxygen and cause hypoxia leading to suffocation. The gas can also affect your brain and nervous system and cause euphoria (happy feeling), difficulty walking or speaking, dizziness, hallucinations, lack of coordination, nausea and loss of consciousness. Repeated exposure may cause mood swings, depression, seizures, brain haemorrhage and impaired memory. It may also damage your heart by causing irregular heart beat and high blood pressure. It may also reduce blood cells, damage lungs and cause liver and kidney inflammation.

Hazard#2: Those occurring due to explosion of the gas if there is a source of ignition

Explosion from LPG can result in serious burns and can cause multiple injuries and even, death. Blast shock waves can affect the ears, lungs and hollow organs of the gastrointestinal tract of a person is close proximity to the blast site. Apart from that, your lungs may be damaged and bleed or swell up due to the impact. The explosion may also cause injury from fragments and other objects propelled in air. It also causes displacement of air that can throw victims, against solid objects and cause injury like bone fractures. There may also be hidden brain injury and potential neurological consequences. Even if not injured, some people may experience post-traumatic stress disorder due to the psychological trauma.

What you should do in case of a gas leak

The smallest spark or flame can ignite gas fumes and cause an explosion, so here are the steps you should take:

- When a gas leak is suspected, extinguish all flames, incense sticks, etc.
- Close the LPG regulator and put the safety cap on the cylinder.
- Don't light matches (or a lighter).
- Do not switch on/off any electrical switches or appliances.
- Open the doors and windows to ventilate building.

- Isolate main electrical supply from the outside.
- Alert the staff for use by alarms or siren
- Evacuate everyone from the affected area.

First Aid

- If inhaled, move the person to a place where he/she can breathe some fresh air. Let him/her rest in a position that is comfortable, and if necessary, you can administer artificial respiration.
- If there has been skin contact with the gas, immediately remove the contaminated clothing. Rinse the affected skin with plenty of water for more than 20 minutes and seek medical help.
- In case of eye contact rinse the eye and the eyelid immediately with plenty of water for more than 20 minutes. Remove contact lenses, if any. Continue rinsing and seek medical help.

The fire from a gas explosion can be extinguished with carbon dioxide (CO₂), dry chemical powder or water spray. Using a water jet and aiming water directly at point where gas is escaping from not recommended as the water may freeze. Also, all sources of ignition and flammable objects should be removed from the area. For the safety of people, they should be evacuated from the area as soon as possible.

Precautions

- Always store gas cylinders away from sunlight, heat, sparks and flame.
- Avoid contact with skin and eyes.
- Protect containers and the valves against physical damage.
- LP gas cylinders must be stored in an upright position. The pressure relief valve should be in the vapor space of the cylinder.

What are the general requirements?

- LPG must be stored in adequate location wherein vessels or cylinders are suitably positioned having regard to the relevant codes of practice
- LPG plant must be designed to appropriate standards and be properly installed and commissioned by competent persons

- Plant must be fitted with adequate safety and monitoring control devices and operated by competent persons
- Occupiers must notify the gas supplier of any structural or other changes which might affect the gas installation
- There must be a suitable programme of maintenance and testing by competent persons
- Plant must be identifiable and accessible for maintenance
- Records of maintenance and tests must be kept
- Precautions must be taken to prevent fire and explosion including appropriate protection of storage vessels
- Installations must have appropriate security measures to prevent deliberate interference
- Incidents involving death or hospitalization, fire or explosion or a significant release of LPG must be reported to the Authority and records of such incidents must be kept

5.13 Emissions and effluents

5.13.1 Wastewater

Effluent arising from domestic activities will be treated in septic tanks and then will be discharged to local drain. LPG storage and filling activities give rise to no waste effluent hence no waste water treatment system is required. Municipal wastewater will generate at rate of 600-650l/day.

5.13.2 Air emissions

No air emissions are expected during process. In case of leakage, broken down pipes, LPG could escape which will have certain impacts on workers. For this, Gas detectors will be provided. Further PPEs will also be provided to workers. Generator emissions will be controlled by proper enclosure, maintenance and tuning.

5.13.3 Noise

During operation, loading and unloading will be the cause of noise. Proper tuning of vehicles will mitigate this problem. Moreover, Tree Plantation along the boundary of Proposed Project and Plantation within the unit will further reduce noise, since plants and

trees serve as noise absorbers. Construction activities noise will be temporary, and will be mitigated by measures as stated in Chapter-5&6.

5.13.4 SOLID WASTE

Solid waste will be municipal in nature and will be handled by solid waste management contractor as per practices of area. Solid waste will generate at rate of 0.4kg/c-d.

5.14 COST AND MAGNITUDE OF OPERATION

Total project cost is estimated to be PKR 10 Million. Cost breakup is given below:

PLANT COST	
Element	Cost (PKR)
Civil Works	2200000
Electrical Equipment	700000
Firefighting Equipments	1000000
Furniture Fixtures	200000
Storage Tank 100 MT	1400000
Ul Listed Explosion Proof, LPG Motors with Pump	1000000
	1000000
Pipelines with Pressure release valves	1000000
ROTO Gauges, Pressure Meters Etc.	200000
Gas Detectors	100000
Automatic Shut Down System with Alarm	100000
Construction & Engineering	200000
Other Misc. Assets	1000000
Total	10,000,000

Activities will include:

1. Applying for and getting all necessary approvals and contracts
2. Construction of boundary wall and other structures
3. Installation/construction of tanks and firefighting equipments
4. Maintenance of machinery and tanks

5.15 SCHEDULE OF IMPLEMENTATION

a. Phase-I (Start-up Phase)

Phase -I is the start-up phase, which involves construction of boundary wall around the entire site. Most of the NOC's required have been taken and this report has been prepared to obtain NOC from EPA.

b. Phase-II (Main implementation Phase)

In phase II, required machinery will be purchased including LPG storage tanks, filling points, cylinder filling area, transfer pump, fire pump for firefighting system, etc. during this phase machinery will be brought on site and installed.

c. Phase-III (Wrap-up Phase)

Phase-III is the wrap-up phase. In this phase, all outstanding activities will be completed, required staff will be recruited, and contracts with suppliers and purchasers will also be signed after which the operational phase finally commenced.

6 DESCRIPTION OF THE ENVIRONMENT

6.1 General

This section covenants with the prevailing environmental conditions of the project area. Information that has been collected from different sources, including public literature, reports of other studies conducted in this area, knowledge with concerned government departments and the first-hand surveys and field measurements has been presented in this section. This chapter encompasses all the important aspects of local environment; such as biological resources, socioeconomic development and quality of living values.

A Social survey in the Project Area was also carried out through consultation with the various communities. Local residents living in the Project Area were interviewed to obtain their feedback regarding Project and its impacts on their daily life/future in the short and long term.

6.2 Purpose of Baseline

For any development project, the prevailing environmental conditions need to be assessed prior to the stages of planning, designing and execution of the project. Identification of physical, ecological and social aspects of environment and collection of relevant data is essentially important for the evaluation of impacts as well as for the suggestion of adequate mitigation measures, which forms the basis for the implementation of the proposed project in terms of prevailing environmental and social conditions in the study area.

6.3 Study Area/ AOI

It is imperative to delineate the area where the potential significant impacts of the proposed Project are envisaged. The Study Area is the area within which the potentially significant adverse environmental and social impacts of the proposed intervention are envisaged. In the light of this, potential impacts on the existing environment have to be considered in a larger geographical area than the proposed “Project Area” depending upon the extent of direct/indirect impacts.

So the “Study Area” includes the Project Area, nearby land having settlements, agriculture fields, etc. The Study Area map is shown in Figure 5.1.

6.4 Physical Environment

This part examines the physical resources such as topography, soil, climate, surface and ground water resources and quality, ambient air quality and noise of the Project site to assess whether the project under assessment can or does have any impacts on any of these parameters. The description of physical environment of project site is presented in the following sub sections.

6.4.1 Topography

Vehari means low-lying settlements by a flood water channel. The district is located along the right bank of the River Sutlej, which forms its southern boundary. Thus, the district is part of the Indus Plain, and is situated in the Nili Bar region, which is the area between Ravi, Beas, and Sutlej rivers. Its land is irrigated with the fertile water of Chenab and Ravi rivers. There are no mountains or hills in the district. It is known for its sweet underground water.

Topographically, the district may be divided into 2 parts: a riverine area and an upland or plain area. The riverine area is close to the River Sutlej, which flows in the district's east along its boundary with Bahawalnagar and Bahawalpur districts. It is generally inundated by the water of the Sutlej, especially during the summer Monsoon season.

The plain area or the upland is in the west, away from the river. The approximate height of this area is 150 m above sea level.

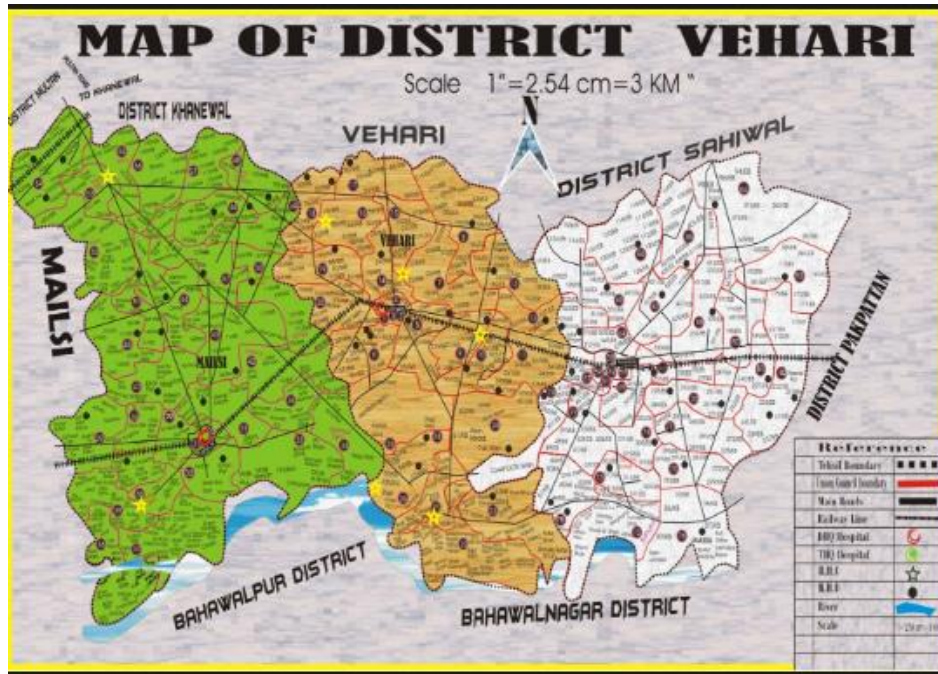


Figure 6-1: Location Map of District Vehari

6.4.2 Seismicity

The district belongs to Zone 2A of the Seismic Zone Map of Pakistan, which means there will be minor to no damage to property due to earthquakes.

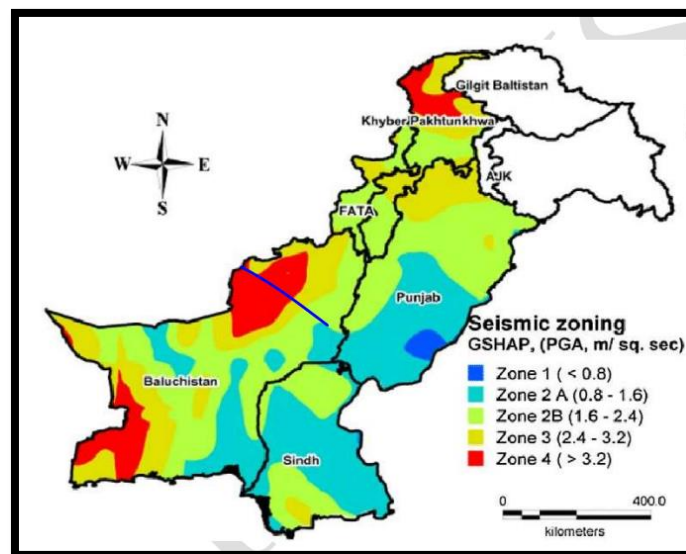


Figure 6-2: Seismic Zoning

6.4.3 Geography

The district is located between 29°36'N 71°44'E and 30°22'N 72°53'E. The city of Vehari is the capital of the district. The district was created in 1976 out of the three tehsils of

Multan District (Vehari, Burewala and Mailsi). The name Vehari means low lying settlement by a flood water channel. It is a part of Indus plain and has the best cultivated land which is suitable for cotton, wheat and other crops. Vehari district is situated in the heart of Nili Bar. It is purely the result of construction of Pakpattan canal from Sulemanki Head Works on the Sutlej and the institution of Nili Bar colony project in 1925, so called because of the bluish tings of the water of the Sutlej. The district lies along the right bank of the river Sutlej which forms its southern boundary. The district, having total area of 4,364 Sq.Kms, is surrounded by Sahiwal, Pakpattan, Bahawalpur, Khanewal and Lodhran districts.

6.4.4 Hydrology

There is only one river, the Sutlej, in the district. It flows along the district's southern boundary. The old bed of River Beas, known as Sukh Beas, lies in the district. Sometimes, during heavy rains, water flows in this nullah. This stream enters the district near Sheikh Fazal, and joins River Sutlej via Pakhi More and Pul. The path of this nullah changed in 1996, and it now joins River Sutlej via Burewala. There are no lakes or marshes in the district, and the irrigation canals provide surface waters

Project site:

Groundwater from depth of 200-250ft can be used for drinking and other purpose. Lab reports of water quality are annexed.

6.4.5 Climate

The climate of the district Vehari is hot and dry in summer and cold in winter. The highest temperature measured between 2009 and 2020 was 47°C in June, 2009 and the lowest temperatures was recorded in February, 2012 i.e. 9°C. The mean monthly precipitation of the Study Area from 2009 to 2020 with an annual average rainfall of 202.8 mm. The maximum wind speed recorded in district Vehari is 24.4 km/h in June 2020. 165. The average temperature, precipitation, relative humidity and wind speed of district Vehari for the year of 2009-2020 are given below

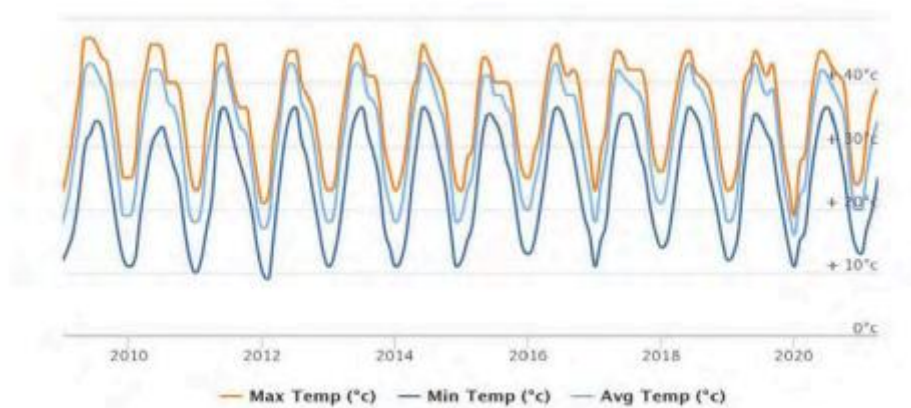


Figure 6-3: Avg Temp in Vehari

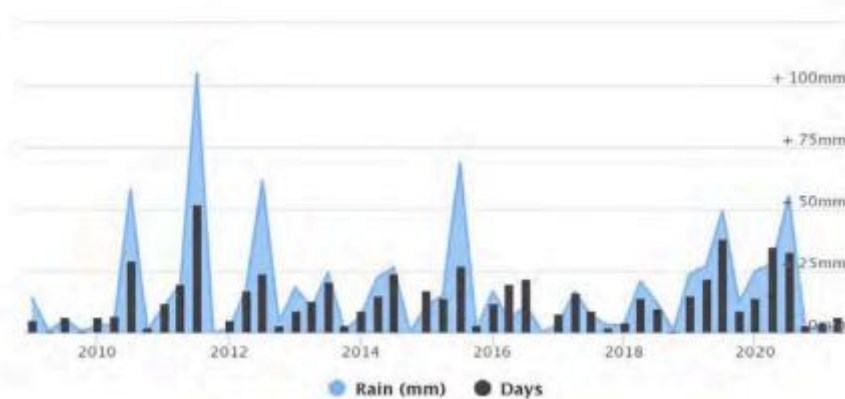


Figure 6-4: Avg Rainfall in Vehari

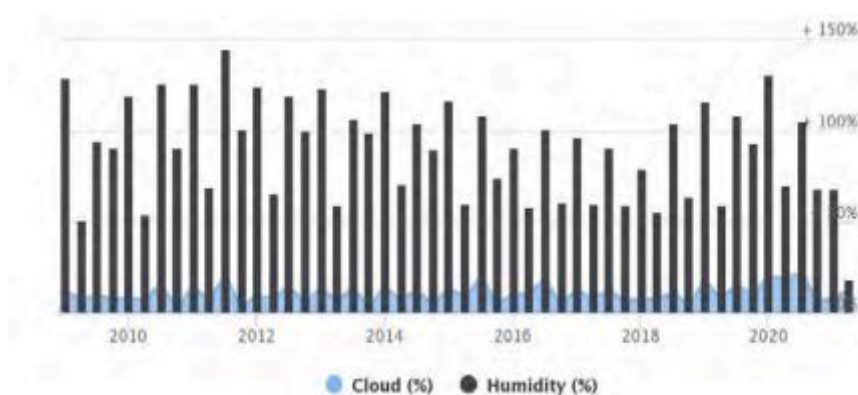


Figure 6-5: Relative Humidity in Vehari

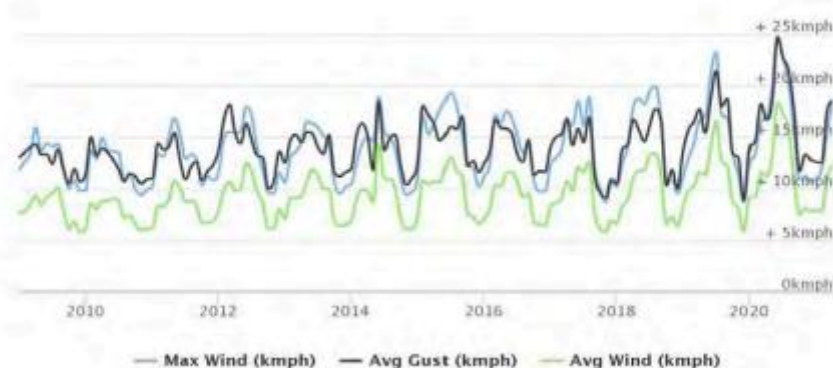


Figure 6-6: Average Windspeed in Vehari

6.5 Biological Environment

6.5.1 Flora

The district is forest deficient. The flora mostly consists of shisham (*Dalbergia sissoo*), kikar (*Acacia Arabica*), toot or mulberry (*Morus alba* and *Morus maraceae*), simbal or sirin (*Albizia lebeck*), sufaida (*Eucalyptus*), semul (*Bombax ceiba*), bakain/ dharek (*Melia azedarach*), jaamun (*Syzigium cumim*), sukh chain (*Pongamia glabra* and *Pongamia pinnata*), ber (*Zizyphus mauritiana*), khajoor (*Phoenix dactylifera*), forget-me-not or liyaar (*Cordia gharaf*), kamaranga or gooseberry (*Averrhoa carambola*), amaltas or golden shower tree (*Cassia fistula*), arjun (*Terminalia arjuna*), phulai (*Acacia modesta*), desi kikar (*Acacia nilotica*), white siris (*Albizia procera*), pipal (*Ficus religiosa*), sohanjna (*Moringa oleifera*), har-singhar or night flowering jasmine (*Nyctanthes arbor tristis*), vann (*Salvadora oleoides*), frash (*Tamarix aphylla*), and okan (*tamarix dioca*).

The major crops cultivated around the proposed project site are Wheat, Millet, Maize, Jawar and cotton. The trees comprise largely of Keekar (*Acacia nilotica*), Phulai (*Acacia modesta*), Shisham or Tahli (*Dalbergiasissoo*), Peeple (*Ficusindica*), and Eucalyptus (*Eucalyptus citriodora*)

6.5.2 Fauna

The only wildlife in the district is wild boar, fox, and jackals. The Islam Barrage Lake on River Sutlej attracts a large number of migratory birds, such as little grebe, cormorants, herons, egrets, Eurasian spoonbill, coot, and black and grey partridges.

Terrestrial fauna of the area are of common domestic nature. Buffaloes, cows, goats, donkeys, hens, dogs, cats and horse etc. are the commonly available animals in the Project Area. The bird community, found in the area, includes variety of residential birds such as crow, sparrow, parrots and doves.

6.5.3 Protected areas / National Sanctuaries

Islam Headworks lake/ reservoir is the only protected wildlife area of the district. This lake/ reservoir provides sanctuary to hog deer and game birds..

There is no wildlife sanctuary or game reserve or any other protected area within the project area.

6.6 Socioeconomic Baseline

This section outlines the results of the social assessment, through primary and secondary data, and other studies, with information and/or data disaggregated by gender, vulnerability, and other social groupings, including:

- a. Define, identify, and enumerate the people and communities to be intervened by the proposed development interventions; describe the likely impacts on the people and communities taking social, cultural, and economic parameters into account.
- b. discuss the project's impacts on the poor, indigenous and/or ethnic minorities (if any), and other vulnerable groups; and
- c. Identify gender and resettlement impacts (if any), and the socioeconomic situation, impacts, needs, and priorities of women.

6.6.1 Reconnaissance Field visit

A reconnaissance visit to the project, before conducting detailed survey was conducted by the consultant, that helped in collection of necessary data/information for primary assessment through consultations with project stakeholders including project beneficiaries and project affected persons.

6.6.2 Data Collection and Field Survey

The Consultant conducted field survey/investigation on various socio-economic aspects to assess the existing socio-economic environment of the project as well as identify likely

impacts under a changing situation with and without the proposed Project. Accordingly, the social study covered the beneficiaries, the affected people and concerned stakeholders in the area and elicited their views / suggestions for mitigation / enhancement of different types of impacts.

6.6.3 Community/Stakeholders' Participation

Community consultations with different stakeholders, beneficiaries and affected communities of the Project Area were organized to facilitate stakeholders' / peoples' participation in the project activities of the proposed project and their views and feedbacks were incorporated for planning/preparation of the project. Such consultations would strengthen the commitment of a wide cross-section of the affected people, public representatives, government employees and professional groups by giving them an opportunity to participate in key decisions.

6.6.4 Population

The following table shows the population of the district and its tehsils as per 2017 Census:

Urban Population	17.5%
Rural Population	82.5%
Total Population	2,897,446

6.6.5 Religion

The main religious groups in the area are Muslims and Christians. The population of the surveyed settlement is predominately Muslims.

6.6.6 Language

Punjabi is the most common language spoken by majority of population in the area. Urdu is spoken as secondary language.

Table 6-1: Vehari Languages

Urdu	5.2%
Punjabi	82.9%
Sindhi	Negligible
Pushto	0.2%
Balochi	Negligible
Siraiki	11.4%
Others	0.3%

6.6.7 Agriculture

The district belongs to the Northern Irrigated Plains Agro-Ecological Zone of Pakistan. It produces one of the best quality cotton in the region.

The crops of the district include cotton, sugarcane, wheat, maize, rice, groundnut, gram, guarseed, jowar, bajra, moong, maash, masoor, rapeseed & mustard, sunflower, barley, sesanum, and linseed.

Fruits of the district include citrus, mango, guava, jaamun, pomegranate, phalsa, banana, and dates.

Vegetable produce of the district includes potatoes, onions, cauliflower, bitter gourd, okra, turnip, peas, tomatoes, garlic, chilies, sugarbeet, and coriander.

6.6.8 Industries

1 industrial estate is being established by Punjab Small Industries Corporation (PSIC) in the district. There are a total of 194 different manufacturing industries scattered in various areas of the district as follows.

Table 6-2: Industries in Vehari

Type of Industry	No.	Type of Industry	No.
------------------	-----	------------------	-----

Auto parts	01	Cotton ginning	145
Flour Mills	18	Pesticides and insecticides	03
Poultry Feed	01	PVC Pipes	03
Rice Mills	08	Textile Composite	-1
Textile Made-up	01	Textile Spinning	02
Textile Weaving	05	Vegetable Ghee/Oil	06

Industries nearby project areas are shown in fig 6-7.

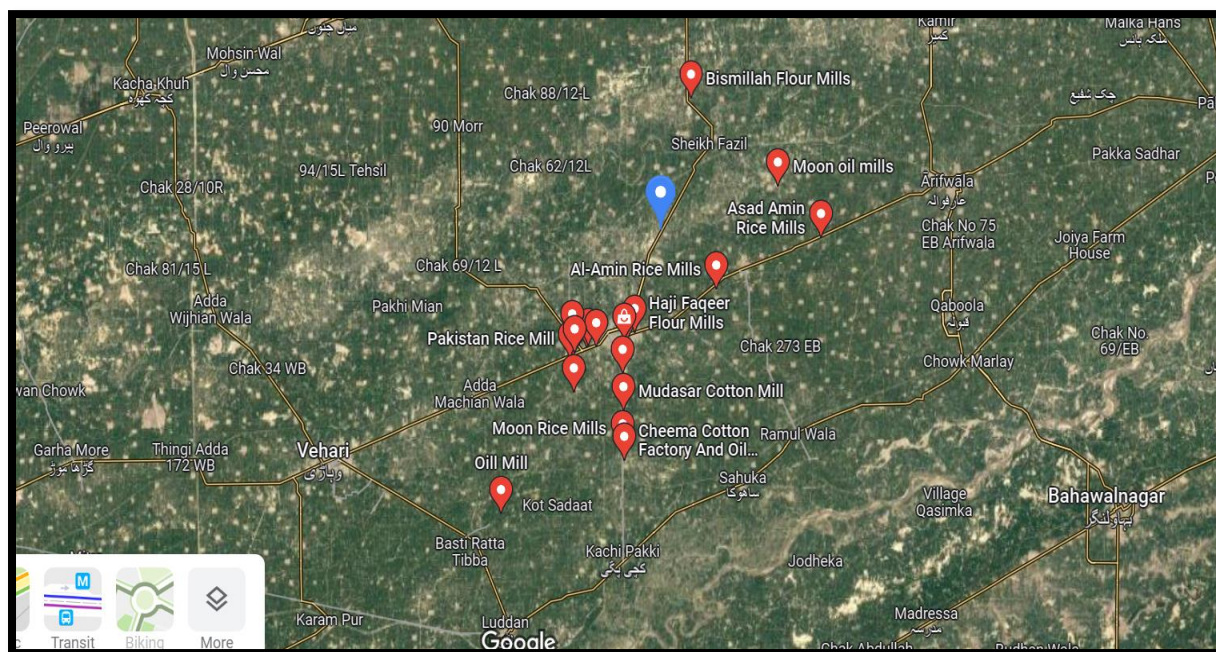


Figure 6-7: Industries in Project Area

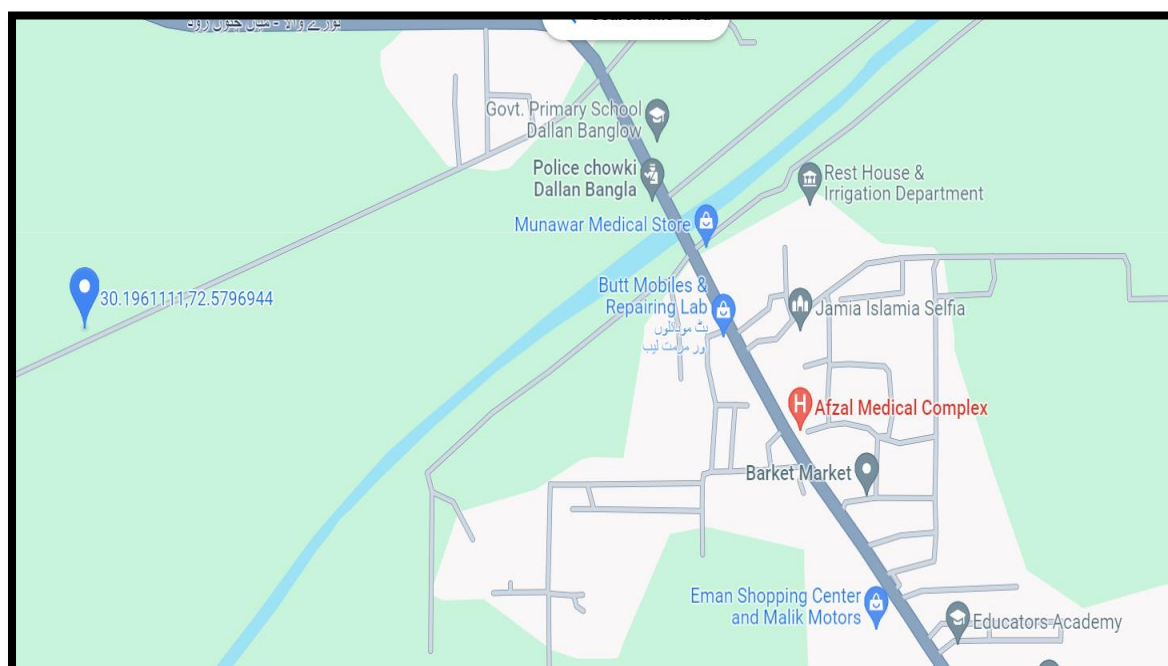
6.6.9 Educational Facilities

The following table shows the details of educational facilities of the district as per Punjab Development Statistics 2018-19:

Table 6-3: Education Facilities in Vehari

Institution	Boys/Girls	Institution	Boys/Girls
Primary Schools	572/467	Middle Schools	108/178
Secondary Schools	80/82	Higher Secondary	14/12
Degree Colleges	10/11	Other Higher Secondary[7]	02/01
Other Degree Colleges[8]	06/08	Technical Training Institutes[9]	04/-
Vocational Institutes[10]	-/03	Commercial Training Institutes[11]	03/-
Universities[12]	02	Govt. Mosque Schools	-/-
Medical Schools	-	Engineering Schools	-

Figure 6-8 represent Educational Institutes present in project area:

**Figure 6-8: Education Institutes in Project Area**

6.6.10 Gender Situation Analysis

Women in the project area have no recognized role in the authority structure of the city. Most of the women stay at home and only travel outside the village in case of visiting relatives, and weddings and to hospitals in nearby towns. However, the traditional attitude of not sending girls to school is changing now, because parents realized and understand that basic education is necessary for each individual without the discrimination of sex.

6.6.11 Social and Cultural Values

The existing communities reflect rural culture with its characteristic norms and values. Women do all household work by themselves. Mostly women do the teaching job. Majority of the population follows Islamic tradition. Common food is wheat bread. Yogurt, Lassi and milk are also used. The common dress for males is Shalwar Qameez and for females Shalwar, Qameez and Dupatta/Chadar. Marriages are celebrated in traditional manners.

6.6.12 Conflict Resolution Mechanism

The people of the area were found to be loving, caring and hardworking. They reported that for petty conflicts resolution, they involve the senior and influential people of the area, who after listening to both the parties try to reach an unbiased decision which is acceptable to the aggrieved. Generally, the people accept the decisions of the influential

6.6.13 Health Facilities

The District Health Officer (DHO) is overall in charge of health services provided in the district. This DHO is supported by doctors, paramedics, technicians, and other support staff. The major diseases that afflicted the residents of the area are seasonal. Cough, flu, fever etc. are the most commonly encountered seasonal diseases. No case of any major disease was reported during the survey. Health Facilities in Project Area are given in fig

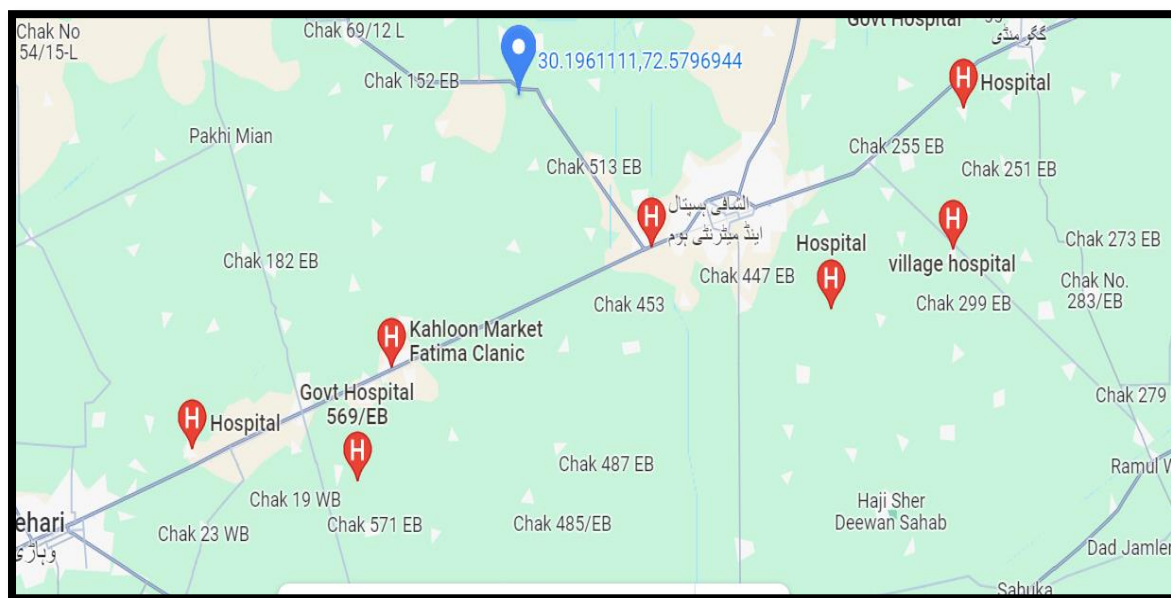


Figure 6-9: Health Facilities in Project Area

6.6.14 Means of Transportation

The modes of transport among the local villagers are buses and wagons. Personal transport includes bicycles, motor cycles and cars owned by the residents of area.

6.7 Lab Reports of Environmental Analysis

Water quality was tested by Punjab EPA certified laboratory. Grab sampling was conducted at existing water bores, which are being used by the community. The parameters were analyzed against Punjab Environmental Quality Standards (PEQS). Lab reports are annexed as Annexure IV

6.8 Site Suitability

Wetlands

There are no wetlands in the project area.

Endangered Species

There are no endangered species of flora and fauna in the project area.

Wildlife Sanctuaries and Game Reserves

No wildlife sanctuary or game reserves are located in the vicinity of the project area.

Critical Habitats

No wildlife sanctuary or game reserve (Critical Habitats) exists in the project area

7 IMPACT ASSESSMENT

7.1 General

This chapter identifies the beneficial as well as the potentially significant adverse environmental and social impacts during design/pre-construction, construction and operation phases of the proposed Project on the physical, ecological and socio-economic domains of the environment. The appropriate mitigation and remedial measures are proposed in this chapter. A project impact evaluation matrix has been developed to evaluate the potential impacts of the proposed Project. A brief qualitative description of each aspect and the affected environment in Study Area / AOI is presented below.

7.2 Notion of Significance / Characteristics of Impacts

The term “Environmental Impact” or simply “Impact” covers the negative, adverse or harmful as well as positive, desirable or beneficial impacts of the project on environmental settings. Prediction of impacts of the proposed activity is based on factual data; however, the significance of these impacts involves a value judgment technique.

The nature of the impacts may be categorized in terms of:

Direction - Positive or Negative

Duration - Long or Short Term

Effect - Direct or Indirect

Extent - Wide or Local

Impact significance depends on both the nature of the impact and on the sensitivity of the receptor. The more sensitive the receptor the greater will be the significance of impact from that proposed activity. For this EIA, activities and nature of impact are combined with the sensitivity of the receptor to evaluate the significance of the impact. The significance of impact is characterized as very low, low, moderate, high and very high. Environmental issues having “moderate”, “high” and “very high” significance is provided with mitigation measures. Following the assessment of magnitude, the quality and sensitivity of the receiving environment or potential receptor has been determined and the significance of each potential impact established using the impact significance criteria matrix as shown below. Most of the potential impacts can be mitigated by implementation of various types of mitigation measures; however, some residual environmental impacts may remain after mitigation.

7.3 Methodology for Impact Evaluation

Evaluation of impacts signifies the potential impacts in terms of its likelihood nature as per the following criteria:

- The impacts are further classified based on their spatial distribution, i.e. *local*, when impacting an area of approximately 1 km radius from the project area, *moderate spread*, when impacting an area of 1 to 2 km radius and *regional* beyond 2 km.
- The impacts are classified as *short term*, *moderate term* and *long term* in terms of their existence in temporal scale. Impacts less than 1 year existence as *short term*, while those with 1 to 3 years as *moderate term* and more than 3 years as *long term*.
- The negative impacts are termed as *adverse impacts* while positive impacts as *beneficial*.

The significance of environmental impacts of various involved activities has been evaluated based on the criteria outlined in Table 8-1.

Table 7-1: Impact Significance Criteria

Impact Significance	Criteria
Long term	When the impact is of high intensity with high spread and high duration
Moderate term	When the impact is of moderate intensity with high-moderate spread and high-moderate duration
Short term	When the impact is of low intensity but with moderate spread and moderate duration or of moderate intensity
Insignificant	When the impact is of low intensity, low spread and low duration
Beneficial	When the impacts are positive

Based on the above-specified criteria, Matrix method has been used to describe potential environmental impacts due to proposed project as shown in Table 8-2 and 8-3. It is important to note that one activity may have varying impacts on different receptors i.e. different components of the environment. To avoid repetitions, this section describes various activities, which may have wide impacts on many receptors.

Table 7-2: Impact Screening Checklist (Construction Phase)

Environmental Sensitivities	Nature of Likely Impacts						Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate Spread	Regional	Beneficial	insignificant	Short Term	Moderate	Long Term
Air Quality		✓		✓							
Noise	✓			✓							
Water Quality		✓			✓						
Land Environment			✓		✓						
Flora		✓		✓							
Fauna	✓			✓							
Local Economy			✓		✓						
Social Impacts			✓	✓							
Health & Safety		✓		✓							

Table 7-3: Impact Screening Checklist (Operational Phase)

Environmental Sensitivities	Nature of Likely Impacts						Impact Significance				
	Low Intensity	Moderate Intensity	High Intensity	Local	Moderate Spread	Regional	Beneficial	insignificant	Short Term	Moderate	Long Term
Air Quality	✓			✓							
Noise	✓			✓							
Water Quality	✓			✓							
Land Environment	✓										
Flora	✓			✓							
Fauna	✓			✓							
Local Economy			✓		✓						
Social Impacts			✓	✓							
Health & Safety		✓		✓							

Table 7-4: Impact Assessment (Construction Phase)

ENVIRONMENTAL STANDARDS						ECOLOGICAL IMPROTANCE		SOCIAL IMPORTANCE			
Surface and Ground Water Quality	Air Quality	Noise	Solid Waste	Smell & Smoke	Fire Hazards	Destruction of Habitat / Vegetation	Disturbance to local fauna	Disturbance to Other Services	Urban Congestion	Employment Opportunities	Public Health & Safety
-1	-1	-1	-1	0	-1	0	0	0	0	+1	-1

Table 7-5: Impact Assessment (Operational Phase)

ENVIRONMENTAL STANDARDS						ECOLOGICAL IMPROTANCE		SOCIAL IMPORTANCE			
Surface and Ground Water Quality	Air Quality	Noise	Solid Waste	Smell & Smoke	Fire Hazards	Destruction of Habitat / Vegetation	Disturbance to local fauna	Disturbance to Other Services	Urban Congestion	Employment Opportunities	Public Health & Safety
-1	-1	-1	1	0	-1	0	0	0	0	+2	-1

Key : 1 = Minor Impacts are defined as Less significant adverse impacts that may be easily prevented or mitigated

2 = Moderate Impacts are considered as likely to have adverse environmental impacts

3 = Major Impacts are defined as significant, or irreversible adverse impact

0 = This category serves no impacts from project

8 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

8.1 GENERAL

Assessment of impacts depends on the nature and magnitude of the activity being undertaken, as well as the type of environmental control measures that are envisaged as part of the project proposal. The potential impacts from the project area are identified and assessed based on the type and scale of the various activities associated with this project.

Several aspects and potential impacts were identified for each phase (Project Location, Construction and Operation) of the development, with impacts evaluated in terms of their nature, occurrence, possibility and severity potential.

8.2 SCREENING OF POTENTIAL IMPACTS

Several impacts are likely as a result of the construction and operation of the project. Such impacts may be direct, indirect or ultimate. For the purposes of this EIA, these potential impacts (whether direct, indirect or ultimate), are assessed based on their magnitude (short-term or long-term) and effect (positive or negative). Impacts are also classified in three groups: impacts due to project location, impacts as a result of project construction and impacts as a result of project operation.

All the potentially significant environmental impacts from the project are grouped below:

Air Environment

- Impact on ambient air quality

Noise Environment

- Impact on ambient noise

Water Environment

- Impacts on surface and ground water quality

Land Environment

- Impacts on land use

Ecological Impacts

- Impacts on trees/vegetation
- Impacts on forests and wildlife

Socio-Economic Impacts

- Impacts on other infrastructure

- Impacts on employment
- Impacts on public health and safety
- Impacts on cultural resources
- Impacts on aesthetics

8.3 IMPACTS DUE TO PROJECT LOCATION

Proposed project will have both socio-economic and environmental implications as discussed in the sub-sections below.

8.3.1 Relocation of People

Currently, there are no infringements on the project site that may be affected therefore relocation exercises are not required.

8.3.2 Loss of Vegetation

Considering the scale of the project and commonly found flora and fauna within the project influence area, no significant adverse effects are envisaged on the ecology of the area.

8.3.3 Shifting of Utilities

There will not be any shifting of existing utilities such as water supply pipelines, sewers, electrical lines, etc. due to the proposed project.

8.3.4 Impact on Archaeological/Cultural Property

Within the project influence area there are no significant archaeological properties, hence no impact in this area is anticipated.

8.4 IMPACTS DUE TO PROJECT DESIGN

Design of the proposed project can have impacts on the environment if it is not prepared accordingly. It is necessary to consider a sustainable project approach. Sustainability is an important issue to consider in design, not only due to environmental concerns but also due to economic and social matters, promoting architectural quality and economic advantages.

At the design phase, no considerable impact would occur on land, soil, topography, ground water, and on people of the area. However, in pre-construction phase a management system should be provided at design level so impacts can be reduced. Design of the building would adhere to all standard technical requirements in order to avoid adverse impacts on environment and human health. All tanks and piping will be done as per standards.

- Storage tanks and fittings are designed as per ASME SEC-VIII. DIV I/NFPA 58.
- All LPG lines are MS/Sch.40/seamless.
- All fire lines are MS/Sch.40.
- Water lines fittings are class 300.
- Plant design is as per MIG Rules 2010.
- Firefighting equipment as per MIG Rules 2010
- LPG lines are hydro tested
- Fire water lines are hydro test
- LPG Tanks design pressure is 250psig

The complete design of said project is made as per requirements of OGRA and they have granted NOC to said company so there will be no such impacts due to design of project. Complete details of tanks are given on map.

8.5 IMPACTS DURING CONSTRUCTION PHASE

Environmental Aspects	Impacts and Mitigation Measures	
	Impacts	Mitigation Measures
Economy Improvement	• During construction Phase, through the use of locally available materials including cement, building blocks, metals, concrete, ceramic tiles, timber, sand, electrical cables etc, the project will continue towards the growth of economy by contributing to the gross domestic product.	• No mitigation measures required.
Employment Opportunities	• With the implementation of the project, there will be employment opportunities for casual workers from the local community. The exact number of workers to be hired will	• No mitigation measures required.

	depend on the magnitude of construction activities during construction.	
Air Quality	- During construction phase particulate matter will be the main pollutant which will be generated during the site development activities such as leveling of land, filling activities, transportation of construction material to the project site from various places. - Due to increased vehicular movement increase in NO_x and CO concentrations will be observed at the project site. However, the pollution levels in the ambient air will be negligible and also it is a temporary phenomenon. As most of the construction equipment will be mobile, the emissions are likely to be fugitive and not concentrated on a single source or place. As the impacts will be localized in nature, the areas outside the proposed project boundary are not likely to face any significant adverse impacts with respect to ambient air quality.	- Dust emission will be minimized through strict enforcement of onsite speed controls as well as limiting unnecessary traffic within the project site. - The traffic routes on site will be sprinkled with water regularly to reduce the amount of dust generated by construction vehicles. - Construction machinery will be kept away from walkways and at safe places where the chances of human interventions are relatively less. - Construction machinery will be properly tuned, serviced and monitored on regularly basis. - All vehicles, construction machinery etc will be maintained in good working condition in order to minimize pollutant emissions.

Water Quality	- During construction phase, water will be required only for construction of structures, sprinkling on roads for dust suppression, domestic uses of the construction workers, that too only during day time. - Water will be used mainly for concrete mixing, sanitary and washing purposes. - No high water consuming activity is likely to occur during construction so the water usage during development of proposed project would not reduce the water availability for other activities within the area.	Workers will be trained for water conservation and reuse of water where possible.
Relocation of Utilities	The construction of the project will not relocate the existing public utilities.	No mitigation measures required.
Poverty Alleviation	Construction of the proposed project will generate the employment opportunities. This will be a temporary minor positive impact.	No mitigation measures required.
Solid Waste Generation	During excavation of the site for foundation works and landscaping, solid waste will be generated. The waste will consist of metal cuttings, rejected materials, surplus materials, excavated soil,	Waste generated during construction will be recyclable and will be reused during construction. The left over construction materials at the end of construction will be used in other projects rather than being disposed-off (if

	paper bags, empty cartons, empty cement bags among other types of wastes.	required). - Recyclable material will be separated at source which will then be handed over to the waste contractor. - Waste bins will be placed at the construction site for waste materials including plastic, paper, and wood. - The cement bags and other such items will be handed over to contractor.
Noise Pollution	During construction phase, the major sources of noise will be due to operation of construction equipment such as concrete mixers, generators, cranes, pumps, compressors, vibrators etc. The operation of such equipment will generate noise ranging between 70-85 dB. Due to moderate levels of construction activities, the anticipated noise generation during construction phase will be mostly confined to the facility itself and not anticipated to have significant adverse impacts on the surrounding ambient noise levels.	- Unnecessary blowing of horns will be strictly prohibited. - In order to safeguard the construction workers working at noise generating sources, these personnel will be provided with proper personal protective equipment such as earplugs, earmuffs etc. Hence, no significant impact is envisaged due to the operation of the noise generating equipment at the project site, if suitable mitigation measures are adopted. - In order to have less impact on noise levels in the air, the major works will be carried out during day time as far as possible. - Equipment noise will be reduced at source by proper maintenance and repair of construction

		machinery and equipment
Ecology	The proposed project site is devoid of forest or thick vegetation. Only wild grasses or small bushes which have grown due to non-cultivation of the area will be removed during levelling operations. Hence, there will not be any major impact on the terrestrial ecology of the project site due to construction activities.	- After completion of the construction work, the damaged area due to construction works will be restored. - After the project completion, plants and trees will be planted on the proposed site that will in turn enhance the aesthetic value.
Workers Health, Safety and Environment	The construction activities may pose negative impacts on the health and safety of workers	- The contractor will ensure that the workers and labors are trained in safety procedures for all relevant aspects of construction. - Workers will be provided with proper safety equipment such as helmets, goggles, masks where required. - Formal emergency procedures will be developed. First Aid Kit will be kept available at the site along with list of emergency phones to be contacted in case of any emergency. - Warning signs will be displayed in local language where required.

8.6 IMPACTS DURING OPERATIONAL PHASE

8.6.1 Spills during Fuel Transfer

Spills may occur during fuel transfer at the decanting area.

Mitigation Measure

- It will be ensured that pipe and couplings for fuel transfer are secured tight and drip pans are put in all likely places where leakage can occur to avoid loss to ground.
- While refueling, drip pans will be used to avoid spillage.
- Impervious surfaces will be well maintained at all places likely to receive spills.

8.6.2 Solid Waste Management

Solid waste generated from proposed project will be domestic in nature. Solid waste will be organic in nature and it may produce vector which could transfer diseases to humans and can be the cause of public nuisance.

Nature of Impact

The nature of impact will be direct, medium, long-term and significant.

Mitigation

Following mitigations should be adopted to reduce the issues related to the solid waste:

- Bins will be provided to collect solid waste; these bins will be emptied by sanitary staff. End disposal and solid waste management will be done as per area practices.
- Solid waste should be stored in the covered bins in order to avoid the growth of vectors and rodents as well as to control the odour and to reduce public nuisance
- Solid waste should be collected and transported to the waste disposal site on daily basis

8.6.3 Wastewater

There will not be any industrial activity so no wastewater will be generated, domestic wastewater will be treated by passing through septic tanks and then discharged in municipality drain.

8.6.4 Air pollution

This will be an indirect impact. The fuel provided to the vehicles will undergo internal combustion in engines and release exhaust emissions, which pollute the air. However, accidental leaks from the tank may result in gaseous emissions and at the time of unloading fuel at the station.

Mitigation Measures

- Gas leakage detection device will also be installed to warn on leakages that are likely to trigger fires.
- Workers will be provided with face masks to avoid inhalation of gas.

- Operating personnel shall possess adequate knowledge and experience of handling LPG to ensure functioning of the station in a safe and efficient manner.
- During unloading of the product from the tank truck to the bulk storage vessels the tank truck shall be parked in the space marked for the purpose.
- During the period of unloading of fuel from tank truck to the storage vessels, operation of dispensing fuel to motor vehicles shall be suspended.
- Adequate greenbelt will be developed and maintained.
- Generators will be provided with proper enclosure; proper maintenance and tuning of generator will be ensured to mitigate air emissions due to generator.

8.6.5 Noise and Vibration

Project only involves storage and filling of cylinders, not any industrial activity so there will be no noise generation. Noise will only be generated during transportation, for this only those vehicles will be used that are properly tuned and maintained and are equipped with silencers. Also excessive use of horns will be avoided. Further tree plantation will be done as it acts as noise absorbers.

8.6.6 Traffic management

Proper parking area is provided for traffic management. Traffic management plan will be as follows:

	Traffic Management Plan	
<i>Management Plan</i>	• Heavy vehicles shall only be to enter and leave the site during day hours. • Speed limit will be ensured • LPG Filling will be on proper places within project boundary • Cars will be parked on proper parking area.	
<i>Monitoring</i>	Responsible	Monitoring Duration
	Environmental manager	Weekly basis

8.6.7 Emergency Response

Incidents and accidents may take place unexpectedly during project operations no matter how effective, strong and efficient the mitigation measures for all adverse impacts; especially the safety issues may be adopted. These may include;

- Fire hazard

FIRE HAZARD

During operational phase of the project, fire hazard poses a serious threat. Firefighting equipment details are mentioned on map.

Mitigation

- Fire extinguishers should be properly maintained and checked periodically.
- Adequate fire hydrant system should be installed.
- Flammable materials should be prohibited in the premises.
- Fire alarm systems should be maintained for detection and warning of fire.
- Pressure gauges should be checked monthly.
- Adequate training of workers on use of firefighting system to deal with the situation.
- Administration of the unit will make a proper evacuation plans for emergency escape from all halls.
- Emergency call service must be made available.
- Firefighting team must remain ready at all times.

8.6.8 Safety Concerns

Operation of the project may cause some concerns for safety, public health and nuisances within the project area.

Mitigation:

- Personal Protection Equipment (PPEs) such as ear plugs, safety Helmets, Gloves, Goggles and Masks will be provided to the employees to ensure their safety at work place.
- Workers' awareness and safety wall chart showing safety symbols and other necessary information will be displayed at various places.
- First Aid Box will be kept in every department which will be within the approach in case of any injury or mishap.
- To avoid any chance of fire, a comprehensive firefighting system will be developed that includes all types of fire Extinguishers, fire hydrants, sand Buckets and firefighting Vehicles.

- Basic medical and safety training will be held from time to time to minimize the risk of health and safety issues which can result from ignorance (ergonomic hazards in particular) in the project premises.

8.7 Potential Environmental Enhancement Measures

Following are the positive impacts of the Proposed Project that will enhance the overall socio-economic and ecological condition of the Project Area.

8.7.1 Employment/Poverty Alleviation

The employment opportunities in the Project Area will be increased due to the construction and operation of the proposed project. During construction and operation of the proposed project unskilled workers will be required as labours, sanitary workers and sweepers as well as for the skilled workers such as; accounts and managers to run the administration office. In totality, the overall economic conditions of the area will be improved.

8.7.2 Increased Business Opportunities

For construction of the proposed building a number of raw-material will be required. Many vendors can supply the required stuff on daily and weekly basis. This will serve as a new business opportunity and it will enhance the socio-economic status of the people direct linked with it.

8.7.3 Tree Plantation

The tree plantation will be carried out along the boundary of the Project Site, and open green spaces as the part of the proposed Project. This will include plantation of ornamental as well as indigenous species of the plants. The plantation will improve the overall ecological conditions of the area. Trees height will be between 3-7 ft. Total number of plants and trees will be approximately 50. Spacing between plant to plant will be 6-8m.

9 ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

9.1 GENERAL

This part of the study discusses the Environmental Management Plan and describes institutional arrangements required for its effective implementation. An Environmental Management Plan renders a delivery mechanism to reduce adverse environmental impacts of a project during its execution, enhance project benefits, and introduce standards of good practices to be adopted for all project works.

Table 9-1: EMP for construction phase

Sr. No.	Environmental aspects	Environmental Impacts of the Activity	Proposed mitigation measures	Responsibility
CONSTRUCTION PHASE				
1	Noise		In order to avoid the nuisance of noise the project maintenance manager shall ensure the all vehicles, equipment, machineries used during construction phase are in good working condition. The working hours of the project construction activities shall be limited to day time only i.e. 08 in the morning till 05 in the evening. Generators, if used during construction phase, shall be kept under canopy to avoid generation of unwanted noise.	Project Manager
2	Water Pollution	Unplanned wastewater disposal may	Wastewater generation during construction phase shall be reused	Project Manager

		contaminate the surface water channels, surface soil and depending upon the quantity of wastewater generated, it has a potential to contaminate the ground water aquifers.	again for material making for construction phase and sprinkling of dust on soil. Domestic wastewater will not be there at the site because at site workers will use local/public washrooms	
3	Air Emissions	Generation of dust and particulate matters is an issue that could arise due to construction activities. Gaseous emissions including SO_x, NO_x, CO₂, lead and CO during construction phase. These gases are ozone depleting reagents. Besides, they also pose threat to human health.	The construction materials e.g. soil, clay would be covered appropriately. Instead of open and dry dumping, sprinkling of water in a quantity that reduces the chances of dust generation would be done. The workers would be provided safety gloves, masks and ear buds and wherever necessary goggles to avoid health complications. Good quality fuel shall be used in the machineries, generators to avoid emission. Vehicles, machineries with good conditions which fall on the quality standards shall be used to control the exhaust emission.	Project Manager
4	Solid Waste	Unplanned dumping of solid waste generation during construction phase can lead to	Solid waste generated during construction phase shall be reused in construction activities rather than dumping. The solid waste	Project Manager

		blockage of roads, waterways and also create unaesthetic sight of the proposed location.	during construction phase will consist most of soil, packaging materials, plastic bags, iron rods, and food leftovers. The organic portion of solid waste shall be collected by local sanitary workers while other material will be reused in the construction activities.	
5	Health & safety	Unskilled workers may create issues in attaining the overall health environment and safety policy.	Regular onsite and offsite training of the workers shall be conducted. Impromptu meetings and discussions with the site in-charge and daily wages workers will be done to resolve any issues that may create health safety and environmental problems during construction phase.	Project Manager
6	Emergency Response	Accidents and/or emergency breakdown of the equipment/machineries/ vehicles involved may create environmental, health and safety hazards.	This situation can be avoided by regular maintenance of the vehicles for quality assurance. Each equipment will be checked prior to operation to avoid accidents and human health danger due to such accidents.	Project Manager

Table 9-2: EMP for Operation Phase

Sr.	Environmental	Environmental Impacts	Proposed mitigation measures	Responsibility
-----	---------------	-----------------------	------------------------------	----------------

No.	aspects	of the Activity		
OPERATIONAL PHASE				
1	Noise	In the project of storage, during loading and unloading noise may be generated.	_ Workers should be told and encouraged to use PPE's (ear plugs or ear muffs).	Project Manager
2	Water Pollution	At the project site, there will be no wastewater generation during operational activity; there will be only domestic wastewater.	- There will be no industrial activity so no wastewater will be generated only the domesticated waste water which will be treated by passing through septic tanks and finally discharged in local drain _ Efforts should be made to ensure that water is conserved and that environment-friendly techniques are adopted too.	Project Manager
3	Air Emissions	Source of air pollution during operation phase would only be dust generated	_Gas detectors will be installed for LPG leakage detection _Generators will be properly tuned and maintained and proper enclosure will be provided. - Workers will be provided with face masks to avoid inhalation of gas. - Operating personnel shall possess adequate knowledge and experience of handling LPG to	Project Manager

			ensure functioning of the station in a safe and efficient manner. - During unloading of the product from the tank truck to the bulk storage vessels the tank truck shall be parked in the space marked for the purpose. - During the period of unloading of fuel from tank truck to the storage vessels, operation of dispensing fuel to motor vehicles shall be suspended. - Adequate greenbelt will be developed and maintained.	
4	Solid Waste	Solid waste comprise of a domestic waste and waste scrap mainly which would be sold to their respective dealers.	_ No waste should be burnt within the premises _ Small waste storage bins should be installed. _ Waste will be finally disposed off by municipal corporation of area.	Project Manager
5	Health & safety	Operation of the project may cause some concerns for safety, public health and nuisances within the project area.	_ Providing Personal Protection Equipments (PPEs) such as gloves, masks to the workers. _ Basic medical training should be provided to the specified work staff and basic medical service and supplies to workers.	Project Manager
			_ Fire extinguishers should be	

6	Emergency Response	Fire hazard	properly maintained and checked periodically. _ Prohibiting flammable materials in the premises. _ Maintaining fire alarm systems for detection and warning of fire. _ Adequate training of workers on use of firefighting system to deal with the situation. _ Gas leakage will be controlled by providing gas detection system _ Safety plan in case of gas leakage will be followed (given in chapter 2)	Project Manager
7	Spills during fuel transfer		— It will be ensured that pipe and couplings for fuel transfer are secured tight and drip pans are put in all likely places where leakage can occur to avoid loss to ground. — While refueling, drip pans will be used to avoid spillage. — Impervious surfaces will be well maintained at all places likely to receive spills.	

9.2 ENVIRONMENTAL MONITORING PLAN

Based on the baseline conditions of the area and the environment management plan, a detailed monitoring plan for the operation phase is designed. Environment monitoring will serve as an indicator for any deterioration in environmental conditions due to operation of the

project. Regular monitoring of environment parameters will serve as a measure to check the efficiency of pollution and to implement control measures.

The main attributes for which monitoring shall be carried out are:

- Air quality.
- Noise Level.
- Waste Collection, Storage and Disposal.
- Worker's Safety

Environmental Quality	Parameters	Details of Location	Standards/Guidelines	Frequency	Responsibility
CONSTRUCTION PHASE					
Waste Collection, Storage and Disposal	Inspection of Waste Generation, collection, Storage and Disposal at site	Construction Site	Statutory Requirements	Once a week	Environmental officer/manager
Workers safety	Injuries and accidents	Recording injuries	-	Onsite	HSE/contractor
Air Quality	Air Quality (PM ₁₀) All relevant stack emissions (CO,NO _x ,SO _x Smoke)	Active Construction Area	PEQS	Once a month	Environment Officer /manager
Water Quality	Groundwater Quality (Total Coliform, Fecal E.Coli, Total Colonial	Groundwater sources near the project site	PEQS	Once a month	Environment Officer /manager

	Count, pH, TDS, Total hardness, Alkalinity Nitrates, Chloride, Sodium, iron)				
Noise Level	Noise level on dB (A) Scale	At least three locations near boundary	PEQS	At least 3 working days	Environment Officer /manager
OPERATIONAL PHASE					
Ambient Air Quality	CO, NO _x , SO _x , SPM, PM ₁₀	Operational area	PEQS	Annually	Environment Officer /manager
Water Quality	Groundwater and wastewater Quality (Total Coliform, Fecal E.Coli, Total Colonial Count, pH, TDS, Total hardness, Alkalinity Nitrates, Chloride, Sodium, iron)	Wastewater sample and groundwater sample	PEQS	Annually	Environment Officer /manager

Noise Level	Noise level on dB (A) Scale	Noise level near the receptor	PEQS	Quarterly	Environment Officer /manager
Waste disposal, procedure for waste collection, storage, and disposal	Inspection of waste generation, collection, storage, and disposal will be undertaken at each site of the project activity	Visual inspection	Statutory Requirements	Once daily	Administration Officer
Safety	Injuries	Injuries will be recorded		Daily	Administrator

9.3 REPORTING AND REVIWING PROCEDURES (Communication and Documentation)

An effective program for storing and communicating environment information during the project is an essential requirement of an EMP. This activity will be done by an independent monitoring consultant. The key features of such a mechanism are:

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

Data recording and maintenance: All forms will be numbered and a tracking system will be developed for each. Whenever a form is released for use in the field, its number will be recorded. The monitors will be required to account for each form after completion. In this

manner, it will be ensured that all forms are returned to the office, be they filled, unused or discarded.

Storage of information: A database for information collected during the project will be prepared. The database may include information on training programs, staff deployment, non-compliance, corrective actions, water resources, results of effects monitoring.

Meeting: For effective monitoring, management and documentation, of the environmental performance during the operation, environmental matters will be discussed during a daily meeting held on-site. Environmental concerns raised during the meetings will be mitigated after discussions with the proponent site representatives.

Reporting: Monitoring body will produce daily, weekly, monthly and another periodic report, as well as a final report of the project based on the information collected. The proponent site representative and the contractors will also prepare a weekly environmental report. Copies will be provided to the proponent and contractor's higher management

9.4 ROLES AND RESPONSIBILITIES OFF ENVIRONMENT MANAGEMENT TEAM

Implementation of EMP is the responsibility of proponent and contractor. This section provides institutional arrangements for environmental management during the proposed activity and defines the roles and responsibility of the various Organizations/departments. The responsibilities of different organizations/departments are summarized below:

9.4.1 Proponent

Responsibility of Proponent includes the following:

- Must take ownership of the process to ensure that its responsibilities are met.
- Supervising construction works.
- Schedule preparation and resource forecasting for engineering and other technical activities relating to the project.

9.4.2 Contractor

The contractor of construction activities will be responsible for:

- Develop and review work instructions and procedures.
- Review and improve method statements for environmental aspects prior to work starting.

- Monitor construction activities to ensure that control measures are effective and ensure compliance with the EMP.
- Coordinate with construction teams to ensure that environmental risks are identified and appropriate controls are developed.
- Coordinate environmental training for site personnel and subcontractors.
- Liaison with the project’s environmental manager, and project public liaison officer.
- Ensure correct procedures are followed in the event of an environmental incident.
- Maintain training register, identify training needs and provide training where required.

9.4.3 EIA/IEE Expert

EIA/IEE Expert (Environmental Specialist) is the member of the supervising consultant’s team. The responsibilities of EIA/IEE Expert include:

- Work with proponent to ensure all statutory environmental submissions under PEPA 1997 (Amended 2012) and other environmentally related legislation are thoroughly implemented.
- Work with proponent to ensure all environmental requirements and mitigation measures from the environmental assessment of the proposed project are included in the contract prequalification and bidding documents.
- Work with proponent to execute any additional EIA requirements needed due to fine tuning of the proposed project and that environmental performance targets are included in the contracts prior to project commencement.

9.5 ENVIRONMENTAL TRAINING

Training is an integral part of a preventive strategy. Environmental and disaster management training will be required to ensure proper implementation of effective environmental management and monitoring plan; and disaster management plan. However, training could be organized by Owner involving relevant staff. As a trainer, competent Consultant can be outsourced. Important training under the spectrum needs to include:

- Training on firefighting and safety management;
- Training on environmental safeguards and compliance;
- Staff training on environmental monitoring and reporting;
- Training on occupational health and safety measure.

9.6 Schedule for Implementation & Environmental budget

Lumpsum of PKR 500,000 budget will be reserved for tree plantation, solid waste management and environmental monitoring. Monitoring tests for ambient air quality, noise and groundwater quality will also be conducted.

Table 9-3: Schedule for Implementation & Environmental budget

Amenities	Frequency	Cost in PKR (Million)
Environmental testing and monitoring	Annually	100,000/-
Tree Plantation/Green Belts Development		100,000/-
Trainings	Biannually	100,000
Health and safety arrangements, Firefighting arrangements and PPEs	Monthly	200,000

10 SOCIOECONOMIC SURVEY AND PUBLIC CONSULTATION

Public consultation refers to the process by which the concerns of local affected persons and others who have plausible stake in the environmental impacts 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 and EIA Review Regulations, public consultation is mandatory for any socio-environmental study.

Impact assessment survey and public consultation sessions held with different stakeholder groups that may be impacted by the said project development. The consultation process was carried out in accordance with the guidelines laid by EPA. The objectives of this process were to:

- Share information with stakeholders on said project installation and operation
- To access the impacts on the physical, biological, and socio-economic environment
- 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 the 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 establishment of said project..

10.1 OBJECTIVES OF CONSULTATION

Public consultation plays a vital role in studying the impacts said project on stakeholders in its successful implementation and execution. It provides an opportunity to exchange knowledge with the all stakeholders. Referring particularly to a project related to environmental assessment, involvement of public is all the more essential, as it leads to better and more acceptable decision-making. The overall objective of the consultation with the stakeholders is to help verify the environmental and social issues, besides technical ones, that have been presumed to arise and to identify those which are not known or are specific to the

project. In fact, discourse with many who have thoroughly observed the site conditions in the pre-developmental phase, goes a long way in updating the knowledge and understanding.

10.2 IDENTIFICATION OF STAKEHOLDERS

All the people who are directly or indirectly affected or concerned with the project are the stakeholder. Besides the living population of the surrounding areas, some other stakeholders were identified and contacted. They are the key players including; shops owners, vendors, public offices, school, university, hospitals,. Not only published material (Both brief and comprehensive literature were obtained on request) but also noted their views and the concerns. Following stakeholders are identified for this project:

Project stakeholders include the settled families, either property owners or the tenants, businessmen (land owners, traders, shopkeepers, vandors, transporters, restuarent owners etc.), employees of the commerical entities. PAPs are of two types, for instance:

- **Direct**

In this case, the PAPs are those who will be benefited directly by project. No disturbance on the local community is being foreseen due to the installation of the said plant.

- **Indirect**

Indirect impact will occur on those who are living or doing business within project area of influence. Indirect respondents include;

- ✓ Government agencies responsible to deal with the project related activities
- ✓ Government Agencies directly, indirectly or widely involved in the execution and monitoring of the said project
- ✓ Workers of political, cultural, religious or social scientific bodies, directly or indirectly related

10.3 PUBLIC DISCLOSURE

Public disclosure is the outcome of all such activities where public is involved at least in the information sharing process. This is an integral part of that process so before the proponent applies for NOC to the EPA, this disclosure will be distributed properly among all stakeholder. It is the responsibility of the proponent and the consultants to display public disclosure document at prominent places where community has easy access.

10.4 CONSULTATION PROCESS

Information disclosure, public consultation and discussion regarding the various aspects of the project with the people of the area are necessary. This process is intensified during the EIA Studies, and separate rounds of public consultations were held. Surveys were carried out in order to investigate physical, biological and socio-economic resources falling within the immediate area of influence of the project. Primary data collection included:

- Data collection regarding the socio-economic condition of the study area
- Pretesting of socio-economic survey tools in the field
- To consult the locals for collection of information on biological environment

Various meeting with the stakeholders were held the following objectives:

- Share information with stakeholders on the said project and expected impacts on community in the vicinity of the project
- Understand stakeholders' concerns regarding various aspects of the project, including the existing condition of the upgrading requirements, and the likely impact of construction and operation activities
- Provide an opportunity to the public to influence the project design in a positive manner
- Obtain local and traditional knowledge, before decision making
- Increase public confidence about the proponent, reviewers and decision makers
- Reduce conflict through the early identification of controversial issues, and work through them to find acceptable solutions
- Dissemination of information through discussions, education and liaison
- Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders
- Incorporation of public concerns and their address in the EIA; and eliciting their comments and feedback

10.4.1 Consultation Methodology

The methodology adopted for consultations is summarized below.

10.4.2 Consultation Material

The main document for distribution to stakeholders during the consultations was Social Impact Assessment Interview.

10.4.3 Consultation Mechanism

Primary stakeholders were consulted during informal and formal meetings held in the project area. 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 likely 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 said 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 EIA involved the community in active decision-making. This process will continue even after this EIA has been submitted, as well as during future EIA 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 EIA 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 EIA report.

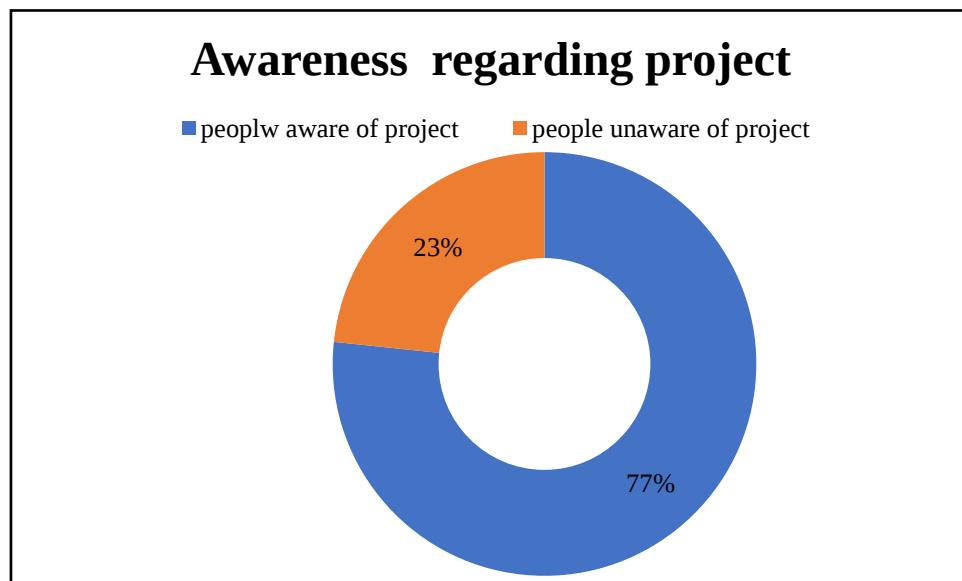
10.5 PRIMARY STAKEHOLDERS CONSULTATION

The community consultations were conducted with the community members outside their settlements to encourage and facilitate their participation. Consultation was done for 1 day.

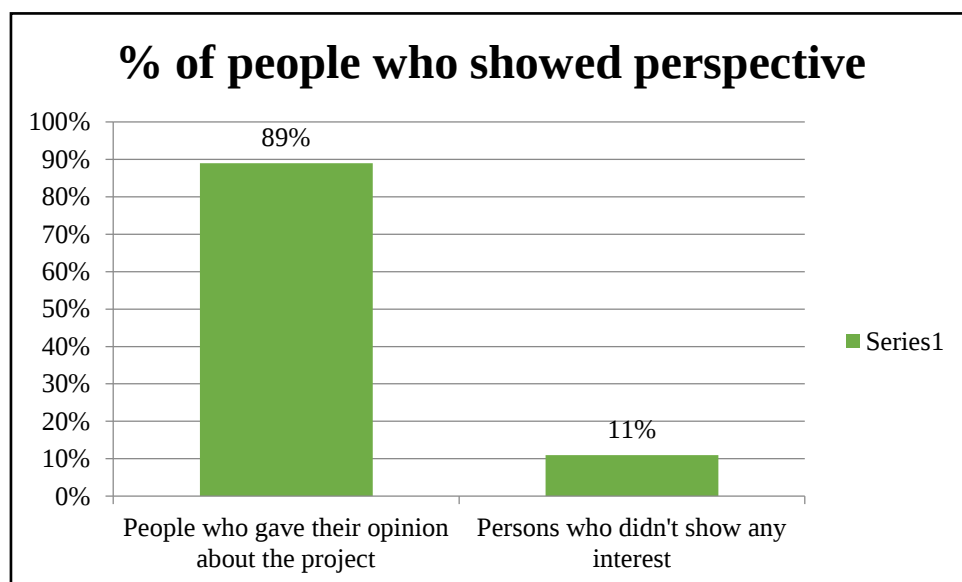
10.5.1 Stakeholder Concerns and Recommendations

The finding of the community consultation has been addressed in various sections of EIA. Mitigation plan has been incorporated into EMP. The summary of consultation with various stakeholders is given below

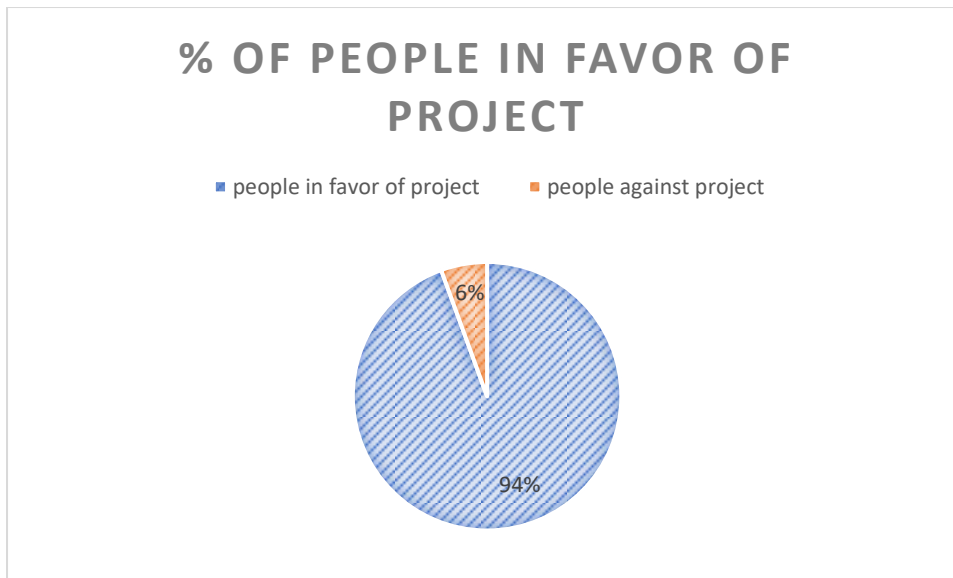
Out of total respondents of, 77% knew about the project whereas 23% were not aware of the project planning and implementation. All people were then briefed about the project.



89% commented their views about the project and 11% didn't respond.



Out of 89%, majority of the people (about 94%) favored the construction of the project keeping in view its importance and 6% people showed pessimistic views in general but mitigation measures and solutions to their concerns were provided.



Majority of people were in favor of project. They said that project will result not only in direct jobs opportunities for locals but also will enhance subsidiary business, trade, education, and community development. The people were of the view that industry might also elevate education standards, struggle for career enhancement besides improvement in standard and quality of living in area. People were also of the view that industry may also be instrumental in connecting the local people with major cities and will result in increase in GDP.

All approached parties signed the questionnaire and were very enthusiastic in giving their comments. They gave several reasons on why the project should start immediately, including security, creation of more employment opportunities for the youth, and the fact that gas would be available at a close range and affordable. However, the neighbors had specific concerns such as smell of the gas, accidental leakages, fire break-outs and distance of the project work from residents. Their worries were explained to them and the measures to be taken. Moreover, the EMP provides for such impacts. They were supportive of the project to go on nevertheless, especially to increased infrastructure, more jobs and provision of more LPG gas to the community.

10.6 Secondary Stakeholders Consultation

The consultations were carried out with the local government officials. Comments and recommendations of all consulted stakeholders are presented in table below:

S#	Participant	Designation	Concerns/Remarks
----	-------------	-------------	------------------

Responsible Authority			
1	Mr. Javed	Inspector Environment	• Environmental enhancement measures such as; Tree plantation, should be ensured • Preventive measures should be adopted to avoid any unfortunate incident • Gas leakage should be controlled by installing efficient gas detectors • Proper emergency evacuation plan and firefighting arrangements should be ensured.
Departments and Agencies			
Oil and Gas Regulatory Authority			
2	Sharjeel Ahmed	Deputy Executive Director	• Proponent team should strictly follow NFPA 58 and LPG Rules 2001 • The company shall mark with conspicuous sign on the place where storage tanks, filling sheds etc are located for safety purpose
Proponent Environment Management Team			
3	Mr. Muhammad Ijaz	Proponent	• Local employment will be ensured • Tree plantation will be done to make project environment friendly • No waste will be dumped improperly • No compromise on health and safety of workers will be bear • Proper arrangements of firefighting will be done
4	Mr. Asif	EHS Officer	
Environmental Practitioners and Experts			
5	Dr. Muhammad Faqir Irfan	PhD. Environment Lawyer	• Proponent should give preference to the local unemployed youths when employing workers for the project. • Proponent shall follow Environment Protection Act Regulations throughout construction and operation of project
Affected and Wider Community			
6	Mr. Khurram	NGO (Parho Barho Punjab)	• Local employment should be ensured • Proponent shall work for betterment of community

11 CONCLUSION AND RECOMMENDATIONS

11.1 CONCLUSION

The report presents Environmental Impact Assessment (EIA) of the Proposed Construction of LPG Storage & Filling Plant.

EIA of Proposed Project is performed according to guidelines of EPA. It includes description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study.

The performed EIA showed all anticipated impacts (both positive and negative), associated with the project. Appropriate mitigation measures as explained in the environmental study shall reduce, if not eliminate, these impacts so that these are within acceptable limits. Moreover, no deterioration, depletion or exploitation of resources is expected to be caused by this project.

Based on overall assessment of the environmental impact of the project, it is concluded that the project is not likely to cause any significant adverse impact on the social, physical and biological environment of the area, provided that suitable mitigation measures as identified in this study are implemented.

It is accordingly recommended that Environmental Approval for the project may be issued by the Environmental Protection Agency, subject to payment of the requisite scrutiny fee by the proponent of the project.

11.2 RECOMMENDATIONS

The Environmental Impact Assessment study and survey results are finally evaluated to recommend the following:

- Implementation of EMP must be given top priority.
- Proper PPEs including ear plugs, ear muffs, mufflers, goggles, gloves and shoes etc. should be provided to workers
- Train workers to use PPEs
- Advise workers to follow SOPs.
- Installation of fire extinguishers in the premises and their monitoring must be ensured.
- Equipment maintenance and efficiency must be checked.

- No compromise on public health and environment should be allowed.
- Waste minimization practices should be employed and workers should be encouraged to adopt such methods.
- Wages should be distributed on time.
- Proper tree plantation plan should also be developed in order to make the unit environment friendly.
- Small waste storage bins should be installed at different corner for proper waste collection and discharge.
- Proper dispensary and first aid box should be provided for workers
- Smoking should be avoided within premises of project site and near fuel storage areas.
- The Security Guards shall also be trained to act in case of all possible emergency situations. The fire alarms can be activated to signal evacuation. At the same time, communication shall be made with hospitals, emergency services and police for urgent support.
- The proposed Environmental Management & Monitoring Plan should be implemented.