CONSTRUCTION OF LPG STORAGE AND FILLING PLANT BY M/S HAROON ENERGY (PRIVATE) LIMITED

LOCATED AT

KHEWAT NO.16, 50/3 KHATOONI NO. 47 TO 52, 127, KHASRA NO. 713/1, 715/1, 714/2, MOUZA AHMAD PUR, TEHSIL & DISTRICT HAFIZABAD

ENVIRONMENTAL IMPACT ASSESSMENT

INSTALLATION OF "CONSTRUCTION OF LPG STORAGE AND FILLING PLANT BY M/S Haroon Energy (Private) Limited at Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad.

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GLOSSARY

a. **Act:** means Punjab Environmental Protection Act, 1997 [Amendment 2012].

b. **Dust:** are fine powdery material such as dry earth/ pollen that can be blown in the air.

c. **Discharge:** means spilling, leaking, pumping, depositing, seeping, releasing, flowing out, pouring, emitting, emptying or dumping

d. **Environment:** means air, water and land; all layers of the atmosphere; all organic and inorganic matter and living organisms; the ecosystem and ecological relationships; buildings, structures, roads, facilities and works; all social and economic conditions affecting community life; and the inter-relationships between any of the factors mentioned.

e. **Environmental Impact Assessment:** means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed.

f. **Effluent:** means any material in solid, liquid or gaseous form or combination thereof being discharged from industrial activity or any other source and includes a slurry, suspension or vapor.

g. **Hazardous Substance:** a substance or mixture of substances, other than a pesticide as defined in the Agricultural Pesticides Ordinance, 1971 (II of 1971), which, by reason of its chemical activity or toxic, explosive, flammable, corrosive, radioactive or other characteristics causes, or is likely to cause, directly or in combination with other matters, an adverse environmental effect; and any substance which may be prescribed as a hazardous substance.

h. **Hazardous Waste:** means waste which is or which contains a hazardous substance or which may be prescribed as hazardous substance or which may be prescribed as hazardous waste, and includes hospital waste and nuclear waste.

Industrial Activity: means any operation or process for manufacturing, making, formulating, synthesizing, altering, repairing, ornamenting, finishing, packing or otherwise treating any article or substance with a view to its use, sale, transport, delivery or disposal or for mining, for oil and gas exploration and development, or for pumping water or sewage, or for generating, transforming or transmitting power or for any other industrial or commercial purpose.

i. **Industrial Waste:** means waste resulting from industrial activity.

j. **Incineration:** The thermal destruction of waste for the primary purpose of disposal, with or without recovery of energy.

k. Note: the term incineration generally means 'the act of burning to ashes.

l. Initial Environmental Examination: means a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an environmental effect for requiring preparation of an environmental impact assessment.

m. Leachate: A liquid that has percolated through and/or been generated by decomposition of waste material. It includes water that come in contact with waste and is potentially contaminated by nutrients, metals, salts and other soluble or suspended components and products of decomposition of waste.

n. Landfill: A waste disposal site used for the controlled deposit of solid waste onto or into land.

o. Mitigation Measure: means measure for control, reduce or elimination of an adverse impact of a development on environment, including a restorative measure.

p. Punjab Environmental Quality Standards: means the permissible standards for emission of air pollutants and noise and for discharge of effluent and waste.

q. Regulations: means the Pakistan Environmental Protection Agency, Review of Initial Environmental Examination and Environmental Impact Assessment Regulations, 2000.

r. Recycling: Set of processes (including biological) for converting recovered materials that would otherwise be disposed of as waste into useful material and/or products

s. Reuse: using a waste product again for the same or different purpose without further manufacture.

t. Suspended Solids: are solid particles suspended in water or air that can be removed by filtration or settlement.

u. **Sustainability:** means such developments that meet the needs of the present generation without compromising the ability of future generations to meet their needs.

v. Waste: means any material, substance, or by-product eliminated or discarded as no longer useful or required after the completion of a process.

LIST OF ABBREVIATIONS

GOPL	Gas and Oil Petroleum Ltd
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand
EA	Environmental Approval
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMtP	Environmental Monitoring Plan
EPD	Environmental Protection Department
EPO	Environmental Protection Order
IESCO	Islamabad Electric Power Company
GOP	Government of Pakistan
HC	Hydro Carbons
HW	Hazardous Waste
IEE	Initial Environmental Examination
IMC	Independent Monitoring Consultant
IPPs	Independent Power Projects
IUCN	International Union for Conservation of Nature
LAA	Land Acquisition Act
MoE	Ministry of Environment
MSW	Municipal Solid Waste
NA	Not Applicable
NCS	National Conservation Strategy
ND	Not Detected
NO	Not Objectionable
PEQS	Punjab Environment Quality Standard
NGO	Non-Government organization
NOC	No-Objection Certificate
NOx	Oxides of Nitrogen
PC	Public Consultation
PEPA	Punjab Environmental Protection Act, 1997 [Amendment, 2012]
PEPC	Punjab Environmental Protection Council
PM	Particulate Matter

PP	Project Proponent
PERSUAP	Pesticide Evaluation Report and Safe Use Action Plan
RAP	Resettlement Action Plan
RFP	Request for Reports
SOx	Oxides of Sulphur
SP	Seismic Provisions
TES	Threatened, Endangered and Special Status Species
TOC	Total Organic Carbon
UBC	Uniform Building Code
VOC	Volatile organic compound
WAPDA	Water and Power Development Authority
WHO	World Health Organization
WWTP	Waste Water Treatment Plant

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

1. TITLE & LOCATION OF PROJECT:

Proposed project is about Installation of LPG Storage and Filling Plant. The plant is construct by Mr. Falik Sher Chattha and planning to name this plant as "Construction of LPG Storage & Filling Plant by M/S Haroon Energy (Private) Limited at Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad. Detailed Environmental Impact Assessment is carried out for issuance of Environmental Approval from EPA Punjab. Location of Proposed site is Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad.

2. PROJECT PROPONENT

Detail of contact person at the panel of M/S Haroon Energy (Private) Limited is described as below:

Name:	**Falik Sher Chattha**
Post:	Project Proponent M/S Haroon Energy (Private) Limited
Contact Details:	**Cell:** +92-345-4646406; **E-mail**: a.s.ent@outlook.com

3. ENVIRONMENT CONSULTANTS:

In order to satisfy EPA's requirement to carry out Environmental Impact Assessment (EIA), Services of **A.S. Enterprises** were hired by **M/S Haroon Energy (Private) Limited**. As per law proposed project fall under **Schedule II Category-A, sub category 5 (Oil and Gas Extraction, production, gathering system, separation and storage)** of Pakistan Environmental Protection Agency Review of Initial Environmental Examination and Environmental Impact Assessment Regulation 2000.

4. PROJECT PARTICULARS:

The project aim is Installation of LPG Storage and Filling Plant under the name "Construction of LPG Storage and Filling Plant by M/S Haroon Energy (Private) Limited. The proposed installation is planned to be developed on land area is 11 kanals & 15 Marlas. Proponent is the owner of the land. Estimated cost of the proposed project is ~ Rs. 500 million including the cost of Proposed Project.

This project involves installation of two storage tanks which encompasses 1785 liters/Ton LPG in each tank Approx. These storage tanks will be locally fabricated with stainless steel having different dimensions such as Tank No 1 & 2, Dia 3552mm", L*W 10488 mm" long. These tanks will be tested at a specified hydrostatic pressure, exceeding the design pressure, to verify their strength and leak-tightness before commissioning, in accordance with ASME

(American Society of Mechanical Engineers standards) Section VIII Div.1 requirements. Pressure gauges are to be buried in the earth pit, with the surrounding area curbed for safety and structural integrity. The fill and dip pipes are proposed to be routed down to the bottom of the LPG storage tank, designed in compliance with ASME Section VIII Division 1 standards. The tank has an internal diameter (ID) of 3048 mm and a shell thickness of 25 mm, with a head thickness of 14 mm. It is designed to withstand a maximum allowable working pressure (MAWP) of 1723.7 kPa at a minimum design metal temperature (MDMT) of -28°C.

The tank is rated for an LPG storage capacity of 50 M Ton, with an additional water capacity of 89,250 liters when filled to 100% but the tank will be fill 15% less in its capacity both for LPG and water. The design incorporates a corrosion allowance is 1mm to ensure long-term durability. The tank's structural design also includes wind resistance, with an allowance for wind speeds of up to 70 mph, and seismic design considerations to withstand potential seismic forces. The system is built with a joint efficiency factor, and non-destructive testing (RT) is performed for weld quality assurance.

In addition, the tank is equipped with a ladder and platform for operator access and maintenance. The overall system ensures operational safety, reliability, and adherence to mechanical design codes, with a specific gravity of 0.55 for the liquid phase and a pressurized environment during operation. These tanks will store LPG to its maximum based on market demand/ need. There will be no room for leaks and these tanks will be rigorously tested before they are put to use. It is very important to assure that LPG leaks are trivial as much as possible. As a result, it is crucial that tanks designed for storage of LPG must be made of best material. Proposed LPG storage tanks will be installed over containment/ bunded area with impermeable lining to avoid risks. Project executor is an environmentally conscious entity and they are striving hard to cater all the environment related issues at the best level in their management. Proposed facility will provide both LPG as well as allied services i.e., store room, rest-rooms, Guard room, bathing and washing space, telephone facility, manager room, labor room etc. at the same time.

5. ENVIRONMENTAL ASSESSMENT:

The impacts of the project activities on environment during construction & operational phases of proposed project have been considered. The mitigation measures have been proposed to minimize / eliminate the negative impacts of the project on the environment. A complete Environmental Monitoring and Environment Management Plan has been recommended to regulate the requirements of Punjab Environmental Protection Act, 1997

[Amendment, 2012]. Annual overall environmental monitoring by a third party will also ensure environmentally sound operation of the project.

The impacts on environment which are likely to be generated during execution of construction phase are summarized in table below:

ACTIVITY	ENVIRONMENTAL IMPACTS	MITIGATION MEASURES
– Construction of paved containment/ bunded area; – Installation of fabricated stainless-steel tanks; – Pipework installation; and, Monitoring system/ tank gauging.	– Improper storage or handling of hazardous/ flammable materials including paints, fuels, solvents, oil, cement etc.; – Dust due to construction activities like excavation, clearing, leveling, compaction etc.; – Noise due to use of heavy machinery; – Violation of applicable air pollutant emissions or ambient concentration standards; – Safety issues for workers; and, Solid waste.	– Hiring of reputable construction contractor with sound knowledge of environment and HSE. – Substantial training of Workers before commencement of work. – Implementation of formal emergency procedures as per code of work by contractor. – Provision of all resources and PPEs consider essential to HSE. – Monitor the performance of contractor/ workers. – Necessary measures like sprinkling of water especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. – Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion – Contractor will prepare waste management plan related to construction activities; get its approval from proponent and ensure its full implementation. – Control noise through control of working hours and selection of less noisy equipment. – PPEs will be provided to the workers and its usage will be made mandatory. – Implementation of measures suggested in EMP of subject study. – Adequate care shall be taken during this phase to avoid any kind of damage to environment as well as worker's safety.

The impacts on environment which are likely to be generated during execution of operational phase are summarized in table below:

ACTIVITY	ENVIRONMENTAL IMPACTS	MITIGATION MEASURES
– LPG fueling/ defueling; – Storage tanks cleaning	– Emissions from routine venting during fueling/ defueling; – LPG leakages/ spills; and, – Health and safety issues.	pollution. – Avoid storage of haze. waste more than a day. – Adequate care shall be taken during this phase to avoid any kind of damage to environment as well as worker's safety. – Perform site check & corrective action; – Maintain record as required; – Substantial training of Workers regarding their code of work; – Provision of all resources and PPEs consider essential to HSE; – Monitor the performance of workers as well as work environment as order of the day; – Proper housekeeping; and, – Check and review regularly all elements of – control measures for their continuing effectiveness.

Proposed project is designed to appropriate standards and is fitted with adequate safety and monitoring methods and will be operated by competent person. Proposed project will be is equipped with engineering controls and intended to evaluate the environmental impact of proposed operational activity to avoid damage to the environment and risks to safety.

Comprehensive Environmental Monitoring and Environment Management Plans are prepared to satisfy the requirements of Punjab Environment Protection Act, 1997 [Amendment, 2012] and rules and regulations made thereunder. Annual overall environmental monitoring by a third party will also ensure environmentally sound operation of the project. The proponent / contractor will hire trained staff to ensure the enforcement of Environmental Management Plan. The equipment will be kept in proper condition to save the environment from any damage.

During construction phase; air quality, ground water quality and surface water quality will be monitored and in operational phase; air quality and wastewater quality will be monitored.

Environmental Committee will be formed to attend and address the issues relating to environment, cleanliness, up keeping, aesthetic beauty of the project site, general environmental enhancement, tree plantation, vegetation promotion, planting of flowers and ornamental plants on site.

The mitigation measures have been recommended in the EIA Report based on the best available techniques which will facilitate the project to operate in environment friendly manner. Based on the findings of this EIA, it can be concluded that the project has negligible

adverse impacts on the existing environment and the proposed project is suitable from environmental point of view.

CHAPTER#01

INTRODUCTION

1.1 OVERVIEW

Haroon Energy (Private) Limited is a key player in Pakistan's natural gas distribution and supply industry, dedicated to delivering reliable and efficient energy solutions to a broad range of consumers. With a robust track record and a commitment to excellence, the company has expanded its footprint in both domestic and industrial sectors, positioning itself as a trusted provider of natural gas. Haroon Energy (Private) Limited emerged as a significant contributor to Pakistan's energy sector. The company was established to address the growing demand for natural gas, particularly in the industrial sectors that require a steady and dependable energy source. Over time, Haroon Energy (Private) Limited has evolved by expanding its network, enhancing infrastructure, and investing in technology, which has allowed the company to continuously provide uninterrupted gas supply to its clients. From its modest beginnings, Haroon Energy (Private) Limited has steadily increased its market share and diversified its service offerings, including gas transportation, distribution, and retail supply. The company's expansion has been driven by its dedication to ensuring the highest quality of service, building strong relationships with both customers and industry stakeholders.

The proposed installation is planned to be developed on land area of 11 Kanals 15 Marla. Land Documents of the proposed project is attached as Annexure-I of this EIA report. The Proposed Project is establishing by Proponent Falik Sher Chattha through its company Haroon Energy (Private) Limited. This project involves installation of two storage tanks which encompasses 1785 liters/Ton, LPG in each tank Approx. These storage tanks will be locally fabricated with stainless steel having different dimensions such as Tank No 1 & 2, Dia 3582mm", L*W 10488mm" long. These tanks will be tested at a specified hydrostatic pressure, exceeding the design pressure, to verify their strength and leak-tightness before commissioning, in accordance with ASME (American Society of Mechanical Engineers standards) Section VIII Div.1 requirements. Pressure gauges are to be buried in the earth pit, with the surrounding area curbed for safety and structural integrity. The fill and dip pipes are proposed to be routed down to the bottom of the LPG storage tank, designed in compliance with ASME Section VIII Division 1 standards. The tank has an internal diameter (ID) of 3048 mm and a shell thickness of 25 mm, with a head thickness of 14 mm. It is designed to withstand a maximum allowable working pressure (MAWP) of 1723.7 kPa at a minimum design metal temperature (MDMT) of -28°C. The tank is rated for an LPG storage capacity of 50 M Ton, with an additional water capacity of 89,255 liters when filled to 100% but tank will be filled 15% less in its Capacity. The design incorporates a corrosion allowance is 1mm

to ensure long-term durability. The tank's structural design also includes wind resistance, with an allowance for wind speeds of up to 70 mph, and seismic design considerations to withstand potential seismic forces. The system is built with a joint efficiency factor, and non-destructive testing (RT) is performed for weld quality assurance. Layout map of the proposed project is attached as **Annexure-II** of this EIA report.

The installation of tanks for LPG storage is a process that requires great care. As a result, it is imperative that the tanks that store massive amounts LPG be made out of the best materials. The tanks need to be the right size for the amount of LPG that they will hold. The LPG Storage and Filling Plant shall be provided with a dedicated containment (bund) area designed to accommodate at least 100% of the tank's capacity, ensuring safety against potential leaks and preparedness for worst-case scenarios. All LPG storage and handling operations shall comply with strict safety protocols to safeguard personnel and the environment.

In order to satisfy EPA's requirement to carry out Environmental Impact Assessment (EIA), Services of A.S. Enterprises were hired by project proponent. According to Punjab Environmental Protection Agency, the proposed project site falls under **Schedule II Category-A, sub category 5 (Oil and Gas Extraction, production, gathering system, separation and storage)** of Review of IEE/ EIA Regulations 2000, requiring Environmental Impact Assessment (EIA).

This EIA report has been formulated for the grant of NOC from Punjab Environmental Protection Agency, Lahore.

1.2 PURPOSE OF THE REPORT

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore in compliance with the legal requirement for Punjab Environmental Protection Act, 1997 [Amendment, 2012]; Section-12 "Preparation and submission of IEE / EIA" for obtaining the Environmental Approval (EA) before starting project activity and **Schedule II Category-A, sub category 5 (Oil and Gas Extraction, production, gathering system, separation and storage)** of Review of IEE/ EIA Regulations, 2000 stating Environmental Sensitive Area requiring Environmental Impact Assessment (EIA). The other relevant regulations and guidelines considered while preparing this EIA report include:

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

» Detailed sectoral guidelines.

» Hazardous Substance Rules, 2003.

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

1.3 IDENTIFICATION OF THE PROJECT AND THE PROPONENT

a. Contact Person

Falik Sher Chattha,

Director

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1.4 NATURE AND SIZE OF THE PROJECT

The project aim is Installation of LPG Storage and Filling Plant under the name “Construction of LPG Storage and Filling Plant by M/S Haroon Energy (Private) Limited. The proposed installation is planned to be developed on total land area is 11 kanals & 15 Marlas. Proponent is the owner of the land. Estimated cost of the proposed project is ~ Rs. 500 million including the cost of Installation. This project involves installation of two storage tanks which encompasses 10488 liters/Ton, LPG in each tank Approx. These storage tanks will be locally fabricated with stainless steel having different dimensions such as Tank No 1 & 2, Dia 3582mm”, L*W 10488mm” long. These tanks will be tested at a specified hydrostatic pressure, exceeding the design pressure, to verify their strength and leak-tightness before commissioning, in accordance with ASME (American Society of Mechanical Engineers standards) Section VIII Div.1 requirements. Pressure gauges are to be buried in the earth pit, with the surrounding area curbed for safety and structural integrity. The fill and dip pipes are proposed to be routed down to the bottom of the LPG storage tank, designed in compliance with ASME Section VIII Division 1 standards. The tank has an internal diameter (ID) of 3048

mm and a shell thickness of 25 mm, with a head thickness of 14 mm. It is designed to withstand a maximum allowable working pressure (MAWP) of 1723.7 kPa at a minimum design metal temperature (MDMT) of -28°C. The tank is rated for an LPG storage capacity of 50 M Ton, with an additional water capacity of 89,250 liters when filled to 100%. The design incorporates a corrosion allowance to ensure long-term durability. The tank's structural design also includes wind resistance, with an allowance for wind speeds of up to 70 mph, and seismic design considerations to withstand potential seismic forces. The system is built with a joint efficiency factor, and non-destructive testing (RT) is performed for weld quality assurance. In addition, the tank is equipped with a ladder and platform for operator access and maintenance. The overall system ensures operational safety, reliability, and adherence to mechanical design codes, with a specific gravity of 0.55 for the liquid phase and a pressurized environment during operation. These tanks will store LPG to its maximum based on market demand/ need. There will be no room for leaks and these tanks will be rigorously tested before they are put to use. It is very important to assure that LPG leaks are trivial as much as possible. As a result, it is crucial that tanks designed for storage of LPG must be made of best material. Proposed LPG storage tanks will be installed over containment/ bunded area with impermeable lining to avoid risks. Project executor is an environmentally conscious entity and they are striving hard to cater all the environment related issues at the best level in their management. This EIA report is the proof of this consciousness that the management is going for the approval of their proposed project. This project of LPG Storage and Filling Plant is designed to comply with national standards of pollution.

The design of the proposed project has been finalized while keeping all the environmental and developmental factors in due consideration. The designing of proposed facility has been made by highly experienced, qualified, and competent structural engineers following the latest building safety codes also. Protection from natural disaster like earthquake has also been considered according to the applicable safety codes.

Adequate open space has been provided around the proposed building in strict compliance with the Building Regulations, 2005 of TMA. This open space is necessary for proper ventilation, light and easy movement.

There will be no process water involved in this project except sewerage waste that will be treated in three stage septic tanks before its final discharge to nearest drain. Underground water pipe will be laid down for water disposal. Ground water will be used for all the project related activities.

1.5 LOCATION OF THE PROJECT

Installation of proposed project is planned to be sited at Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad.

Location map of the proposed project is presented in Chapter-3, under heading "*Project Location/ Site Layout*" of this report.

1.6 SCOPE OF STUDY

For achieving the objectives of EIA, the study is mainly divided into the following sub-tasks:

- Identification of various legal / statuary requirements as set forth by the Punjab Environmental Protection Act, 1997 [Amendment, 2012] and the guidelines for preparation of EIA Reports and review of existing regulatory framework in the country with reference to the development projects;
- Collection of data related to physical, ecological, and socio-economic recourses of the project area;
- Identification and evaluation of salient environmental impacts;
- Identification of necessary mitigation measures to minimize the adverse impacts; and
- Preparation of an Environmental Management Plan (EMP).

The key steps followed while conducting EIA are briefly described below.

1.6.1 Review of Project Documents

Previous relevant reports have been reviewed for getting insight into the project area and related issues. Some offices and organizations were also visited for acquisition of published reports and data.

1.6.2 Reconnaissance Survey

The reconnaissance survey under this study was conducted in first week of Aug, 2021 by an interdisciplinary team consisting of Environmentalist, Health & Safety Specialist to conceptualize the project and understand the potential environmental and social impacts associated with the proposed project and also to familiarize the environmental setting and local conditions.

1.6.3 Data Collection

Both primary and secondary data were collected to accomplish the objectives of the study. The primary data was collected by conducting field survey in first week of march, 2025 through environmental monitoring, individual interviews of local population, focus group discussions and consultations with local community, while secondary data was collected from the published government documents, i.e., Economic Survey of Pakistan, District Population Census, Multiple Indicators Clusters Survey, Weather data, Government Acts, Laws and Regulations. Based on the environmental checklist, socioeconomic questionnaires and area profile as well format for consultations, field surveys were carried out to collect data on the physical, biological and social environment aspect of the project site.

i) Physical Environment

The physical aspects of the project site covered the following:

» Soils - type of soils, erosion, stability
» Land use pattern of the area including agriculture crops, barren lands, industrial and residential use
» Affected buildings - residential, industrial, commercial, and structures of buildings
» Drainage pattern
» Available energy source(s)
» Other private/ public infrastructure/ utilities like pipelines, electric poles
» Water resources available both surface and groundwater
» Air quality and noise level in the project impact corridor

ii) Biological Environment

In consideration of ecological environment, the following main aspects were studied:

» Existing vegetation along the project impact corridor
» Trees likely to be affected due to the project implementation (if any)
» Endangered species both flora and fauna
» Wildlife in the project impact corridor
» Forests and game reserves existing along project impact corridor
» Beneficial plants and animals in the project impact corridor
» Aquatic life including fish resources
» Wetlands within the vicinity of the project impact corridor

iii) Social Environment

Social assessment has attempted to determine the social implications in terms of assumed positive and negative impacts as a result of the implementation of the proposed project. The socioeconomic baseline data covered the following major aspects**:**

» Demographic profile
» Population
» Number of households
» Literacy status
» Nature of business/ occupations
» Livelihood/ income
» Living standard of the population
» Access to credit
» Social infrastructure available
» Women issues

» Community perceptions about the Project

1.6.4 Stakeholders/ Public Consultations

During the detailed field survey in first week of march, 2025; consultations were made with local community/ general public as well as intent officials. The basic purpose of these consultative meetings/ focus group discussions was to i) share information with stakeholders about the expected impacts of proposed development works on the physical, biological, and socioeconomic environment; ii) understand stakeholders' concerns regarding various aspects of the project, including the existing conditions and the potential impacts of the proposed project.

1.6.5 Data Processing and Analysis

After collecting all above data from different sources including interviews from communities, consultations, physical observations, and data compiled from other documents was analyzed. Accordingly, the results were presented through tables (means, percentage, number), graphical/ pictorial illustrations.

1.7 PERSONS PERFORMING EIA STUDY

EIA study of the project has been conducted by A.S. Enterprises, according to the Review of IEE/EIA Regulations 2000, Pakistan Environmental Protection Agency (Pak EPA), Punjab Environmental Protection Act, 1997 [Amendment, 2012], and other relevant Regulations and completed this EIA Report. List of names, qualifications and roles of team members carrying out the EIA study is provided as **Annexure-III** of this document.

1.8 ROLES AND RESPONSIBILITIES

The executing firm/company of the proposed project will be the M/S Haroon Energy (Private) Limited; Role and responsibilities have been proposed in the EIA report. Proposed mitigation measures, as defined in the EMP will be primarily implemented by the management of M/S Haroon Energy (Private) Limited, with responsibilities assigned to various departments. Project Proponent will strictly adhere to implement all mitigation measures contained in this report in order to minimize any negative impact on any component of environment during and after execution of project. Institutional arrangements have been suggested in Chapter-7 of this document, so that proposed mechanism of environmental protection shall work in time.

1.9 ROLE OF ENVIRONMENTAL PROTECTION AGENCY, PUNJAB

The main responsibility of Environmental Protection Agency, Punjab will be to monitor the mitigation measures, which will be taken up or implemented by M/S Haroon Energy (Private) Limited. EPA is endorsed to inspect compliance of sections 13, 14, 17, & 18 of IEE/ EIA Regulations, 2000, which enunciate the conditions for approval, confirmation of compliance,

entry, inspection and monitoring of proposed project. Hence, EPA Punjab is the sole entity which is responsible to issue the necessary approval by exercising powers under section 12 of Punjab Environmental Protection Act 1997 [Amendment, 2012] after proper review of this EIA document.

1.10 ORGANIZATION OF EIA REPORT

The EIA report is divided into following chapter:

Executive Summary

Chapter 1: Introduction

Chapter 2: Legal Framework

Chapter 3: Project Description

Chapter 4: Description of Environment

Chapter 5: Stakeholder Consultation

Chapter 6: Impact Identification & Mitigation Measures

Chapter 7: Environmental Management Plan

Chapter 8: Findings and Recommendations

Annexure

CHAPTER-2

POLICY LEGAL AND ADMINISTRATIVE FRAMEWORK

GENERAL

This section deals with the current policy as well as legal and administrative framework related to carrying out of Environmental Impact Assessment of various projects.

Like other Projects, the proposed Project, before its execution, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection Act, 1997 [Amendment, 2012].

2.1 EXISTING REGULATIONS AND LEGAL FRAMEWORK

According to environmental laws of the country development projects have to undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) in order to predict and mitigate the impacts of the development at an early stage. Based on nature, size, cost and associated impacts, the proposed project has been categorized for EIA Study according to the Regulation "4" of Statutory Notification issued on June 13, 2000 (S.R.O.339 (1) /2001). The Proposed Project is Construction of LPG Storage and Filling Plant by M/S Haroon Energy (Private) Limited owner Falik Sher Chattha under the name of "Construction of LPG Storage and Filling Plant" located in Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad. As per **Schedule II Category-A, sub category-5 (Oil and Gas Extraction, production, gathering system, separation and storage)** of the IEE / EIA Regulations 2000 made under section 12 of Punjab Environmental Protection Act, 1997 [Amendment, 2012] under which the Environmental Impact Assessment (EIA) is mandatory for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

This EIA Study has been carried out in the light of the policy guidelines of the Government of Pakistan, under the procedures and practices formulated by the Provincial Environmental Protection Agency (EPA-Punjab).

2.2 RELEVANT LEGAL / INSTITUTIONAL FRAMEWORK

The applicable laws for the environmental study of the proposed project are briefly given below. The proponent of the proposed project will abide by the applicable laws and regulations.

2.2.1. NATIONAL CONSERVATION STRATEGY, 1992

On March 1, 1992, the Cabinet of Pakistan approved the National Conservation Strategy. It describes the stark reality of the country's deteriorating resource base

and its implications for what is still largely a natural resource-based economy. It sets forth the beginnings of a plan to integrate environmental concerns into virtually every aspect of Pakistani economic life.

The strategy has three overriding objectives: conservation of natural resources, sustainable development, and improved efficiency in the use and management of resources.

2.2.2. PEPO, 1983 AND PEPA, 2012

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO), which was replaced by the Pakistan Environmental Protection Act (PEPA) 1997, through an Act of Parliament. Now the PEPA 1997 has been replaced by Punjab Environmental Protection Act, 1997 [Amendment, 2012] on 18th April, 2012. Under Sec. 8 of Environment Protection Ordinance (EPO) 1983, it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

Under section 12 of the Punjab Environmental Protection Act, 1997 [Amendment, 2012] it is mandatory to take an Environmental Approval Environmental Protection Agency for commencement of any construction of project. This study has also been carried out under section 14 "***Handling of Hazardous Waste***" of the Punjab Environmental Protection Act, 1997 [Amendment, 2012] stated "no person shall generate, collect, consign, transport, treat, dispose of, store, handle or import any hazardous substance except (a) under a license issued by the Provincial Agency and in such manner as may be prescribed; or (b) in accordance with the provisions of any other law for the time being in force, or of any international treaty, convention, protocol, code, standard, agreement or other instrument to which Pakistan is a party".

2.2.3. NATIONAL ENVIRONMENTAL POLICY 2005

The national environmental policy 2005 aims to protect, conserve and restore the environment in order to improve quality of the life of citizens through sustainable development and resource conservation. The main objectives of the policy are;

- Conservation, restoration and efficient management of the natural resources.
- Integration of the environmental considerations in policy making and planning process.
- Capacity building of government agencies and other stakeholders at all levels for the better environmental management.

- Meeting international obligations effectively in line with the national aspirations.
- Creation of a demand for environment through mass awareness and community mobilization.

2.2.4. NATIONAL FOREST POLICY 2001

This policy covers the Renewable Natural Resources (RNR) of Pakistan i.e., Forests, Watersheds, Rangelands, Wildlife, Biodiversity and their habitats. The policy seeks to launch a process for eliminating the fundamental causes of the depletion of RNR through the active participation of all the concerned agencies and stakeholders, to realize the sustainable development of the resources. It is an umbrella policy providing guidelines to the Federal Government, Provincial Governments and territories for the management of their RNR. In consonance with it, the Provincial and District Governments may devise their own policies in accordance with their circumstances.

The goal of this policy is to foster the sustainable development of RNR of Pakistan, for the maintenance and rehabilitation of its environment and the enhancement of the sustainable livelihoods of its rural masses especially women, children and other deprived groups. The elements of the policy are as follow:

1. Population planning in critical eco-systems.
2. Providing substitutes to firewood in the wooded mountains.
3. Reducing the impact of socio-economic causes.
4. Reducing poverty, poverty of opportunity, and powerlessness.
5. Reducing political interference in the Forestry and Wildlife Departments.
6. Renovating and invigorating the institutions of RNR.
7. Supporting Local Governments in the sustainable development of their RNR.
8. Policies for fragile natural Eco-systems.
9. Riverain forests.
10. Irrigated Plantations.
11. Preservation of relict and unique forests.
12. Wildlife.
13. Rangelands and desert eco-systems.
14. Planting of trees and fodders on farmlands.

2.2.5. REVIEW OF IEE AND EIA REGULATIONS, 2000

The GOP has issued Review of Initial Environmental Examination and

Environmental Impact Assessment Regulations 2000, to review the Initial Environmental Examination (IEE) / Environmental Impact Assessment (EIA) Reports.

2.2.6. GUIDELINES FOR THE PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS, 1997

The GOP has also framed guidelines for the preparation and review of IEE/EIA of projects in various developmental sectors.

2.2.7. PUNJAB ENVIRONMENTAL QUALITY STANDARDS (PEQS)

Powers conferred under clause (c) of sub-section (1) of section 4 of Punjab Environmental Protection Act, 1997 [Amendment, 2012] has been approved the Punjab Environmental Quality Standards (PEQS), 2016 for municipal and industrial effluents, noise, drinking water, motor vehicle exhaust, air emissions, industrial gaseous emissions and treatment of liquid & disposal of biomedical waste.

2.2.8. GUIDELINES FOR SENSITIVE AND CRITICAL AREAS

GOP has issued Guidelines for Sensitive and Critical Areas in October, 1997. The objective of the guideline is to provide guidance to project proponents and other stakeholders in the environmental assessment process, so that the proposed projects are planned and sited in way that protects the values of sensitive and critical areas.

2.2.9. POLICY & PROCEDURES FOR THE FILING, REVIEW & APPROVAL OF ENVIRONMENTAL ASSESSMENTS, NOVEMBER-1997

Environmental Assessment is the Primary means of managing the approval of new development proposals in Punjab. Environmental Assessment allows for the systematic examination of proposals, clear procedures which provide for the interests of relevant Government Departments and other stakeholders to carefully consider the environmental impacts of new developmental projects.

2.2.10. GUIDELINES FOR PUBLIC CONSULTATION, PAKISTAN ENVIRONMENTAL PROTECTION AGENCY OCTOBER, 1997

This guideline is part of a package of regulations and guidelines which include:

- Punjab Environmental Protection Act, 1997 [Amendment, 2012]
- Policy and Procedures for filing, review and approval of environmental assessments
- Guidelines for the preparation and review of Environmental Reports

» Guidelines for sensitive and critical areas
» Punjab Environmental Quality Standards (PEQS)
» Detailed sectoral guidelines

2.2.11. PUNJAB WILDLIFE PROTECTION ACT, 1974

This act was framed in 1974 by the Province Punjab and is about of protection and conservation of Wildlife.

2.2.12. FOREST ACT, 1927

This act was framed in 1927. The Forest Act, 1927 is still the basic charter for the forest departments in Pakistan. This law empowers provincial governments to manage forest areas.

2.2.13. PUNJAB LOCAL GOVERNMENT ORDINANCE, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. Under the Ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

2.2.14. PAKISTAN PENAL CODE, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 272 and 273 of this Act deal with the adulteration of food or drink. Noise pollution has been covered in Section 268, which defines and recognizes noise as a public nuisance. "A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger or annoyance to the public or to the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right."

2.2.15. OCCUPATIONAL HEALTH

Construction and operational activities could affect the occupational health of the workers. Quantitative national standards with respect to the above aspect are yet to be developed in Pakistan. However, guidance in qualitative terms can be obtained from the Pakistan Factories Rules, 1962 (based on the Factories Act, 1934) and the Labor Laws (Amended) Ordinance, 1972.

2.2.16. TOXIC OR HAZARDOUS WASTE

Protection of the environment with regards to toxic and hazardous waste is covered by the Pakistan Penal Code (PPC), 1860. Environment Protection Department (EPD), Punjab, is mandated to monitor the transportation of hazardous materials within the provincial limits.

2.2.17. HAZARDOUS SUBSTANCE RULES, 2003

Rule 5 stated that project/ industrial activity must be accompanied by Environmental Impact Assessment (EIA) involving generation, collection, consignment, transport, treatment, disposal, storage, handling/ import of hazardous substance in respect of which the license is sought.

CHAPTER-3

PROJECT DISCRIPTION

3.1 TYPE AND CATEGORY OF PROJECT

According to environmental laws of the country, development projects have to undergo the process of Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) in order to predict and mitigate the impacts of the projects at an early stage. Based on nature, size, cost and associated impacts, the project under consideration has been categorized for Environmental Impact Assessment (EIA) Study. According to Pakistan Environmental Protection Agency (Review of IEE and EIA) Regulation 2000, the proposed project falls under **Schedule II Category-A, Sub Category 5 (Oil and Gas Extraction, Production, Gathering System, Separation and Storage)**.

The Project is Installation of LPG Storage and Filling Plant by M/S Haroon Energy (Private) Limited. The License is purchased by Falik Sher Chattha from OGRA. Proposed project site is located in Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad.

This project requires NOC / License under Section 12 of Punjab Environmental Protection Act, 1997 [Amendment, 2012]. The Environmental Impact Assessment (EIA) fulfills the mandatory requirement for getting Environmental Approval. The Director General, EPA Punjab is the authority to issue the requisite Environmental Approval after proper review of the project.

3.3 OBJECTIVES OF THE PROJECT

The stated project is one of the principal commercial ventures for LPG storage and distribution, adhering to the highest standards and ensuring superior operational performance. The objective of the proposed installation is to ensure the continuous supply of quality and environment-friendly LPG products and related services to industrial, commercial, and retail consumers, consistently exceeding their expectations through reliability, cost-effectiveness, and uncompromised product and service quality.

3.4 ALTERNATIVES CONSIDERED & THEIR REASON OF REJECTION

The LPG industry is important because it is a major source of economic innovation. Sustainable access to petroleum products is critical component for socio-economic growth. Market-access restrictions in the form of preferential procurement and procedures affect the ability of bring quality petroleum products to market. In Pakistan, petroleum industry is continued to support the ongoing reforms, and act as a partner of local and regional retail authorities to deliver on their shareholder values. Both innovative and generic fuel sectors are benefiting from this growth.

An analysis of available alternatives is necessary to establish that the most suitable management and technology options will be adopted for the project, while minimizing environmental impacts. This evaluation explains the selection of appropriate option that was required to ensure optional results within defined set of economic environmental, health and safety constraints. In particular it outlines the following project options:

1. The "No-Development Option"
2. Alternative Site Option

1. No Development Option: No project means there would be no project at all. The no project option, if taken, would stop the community from an important and necessary project which is the need for today as per limited resources/ facilities being provided to general public. Other impacts of the 'No project' option would be loss in employment and social welfare in the project area, as the project is bound to create jobs and improve the existing condition of the community of the area through different community development and social welfare projects. From the environmental point of view, this option would result in the loss of opportunity in further improvement of the environmental management of the area, environmental baseline data, and the mitigation and compensatory programs.

2. Alternative Site Option- Site Selection Criteria: In reference to the project alternatives, the Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited., is a commercial venture. The final selection of site is based on following criterion:

- **Accessibility:** The site should be accessible from a permanent road to allow ready transport.
- **Water Supply:** Availability of adequate water supply, which should also meet drinking water standards.
- **Soil Condition for civil structures:** Suitability and stability of soil conditions required for civil structures
- **Sufficient land availability:** Availability of sufficient land to design and layout plan in an appropriate manner, with consideration of future expansions.
- **Electricity:** Availability of electricity from the National Grid for an uninterrupted supply of power, required for the project.

In view of all above criteria regarding site selection, it is to be sited at a place where there are bright prospects and need of the same. It should also meet the legal requirements of the Town Municipal Administration (TMA), Hafizabad in the matters relating to the land use conditions of the project area. The infrastructure and cable network are already present at the proposed project site. Availability of access road, communication facilities, electricity, basic

infrastructure, sewerage etc. is another necessary requirement for the proposed project which are already available at the proposed site. Many sites were visited for proposed project but due to instability of land, land disputes, and no proper road approach etc. were the reasons of rejections. So, after spending days in search of clear land from all above said issues, this proposed land was selected. Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. New technical staff will be hired for the proposed project. This will help to manage the project activities smoothly. The selected project land is under the possession of the proponent and he is owner of the land, so administrative control on proposed project will be easy. The geographic position of the proposed project is very ideal which connects to the neighboring infrastructure.

All the above stated qualities for an ideal site for the proposed Section are present in the selected project site. Keeping these requirements and their feasibility, proposed project is a blend of easily accessible location, most efficient, cost effective and environmentally sound design, elaborated by quality construction, is simply the best. All the other basic infrastructural requirements are also available at the selected site. Accordingly, the selected site is ideally suited for construction of the proposed project.

3.5 PROJECT LOCATION/ SITE LAYOUT

Stated project is Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited., is proposed to be sited at Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad. The coordinates of project site are **32°06'22.4" N 73°45'21.9" E.** The main access road to the project area is Main Gujrat-Hafizabad Road. There is no other LPG Storage facility within distance of 50-100 km from proposed project area on both side toward Hafizabad and Gujrat. Front, Back, right and left side of Proposed project is open land. **Figure 3.1** is showing location map of the project's site. Besides, project layout map has been appended as **Annexure-IV** and site location map with more detailed illustrations has been appended as **Annexure-VI** at the end of this document.

3.6 LAND USE AT THE PROJECT SITE

The project site is located at tehsil & district Hafizabad as mentioned earlier. Proposed project site is an open area surrounded by open land. There is no other LPG Storage facility situated within distance of 50-100 km from proposed project area on both side toward Gujranwala and Gujrat, Commercial activities are going on along the main Gujrat Road and the commercial activities are increasing rapidly in this area as this is also a main road connecting different areas of the Hafizabad, Gujrat and most important city of the Punjab is

Gujranwala. Land use in the surrounding of the project area is described as below:

North: Open land

South: Open land

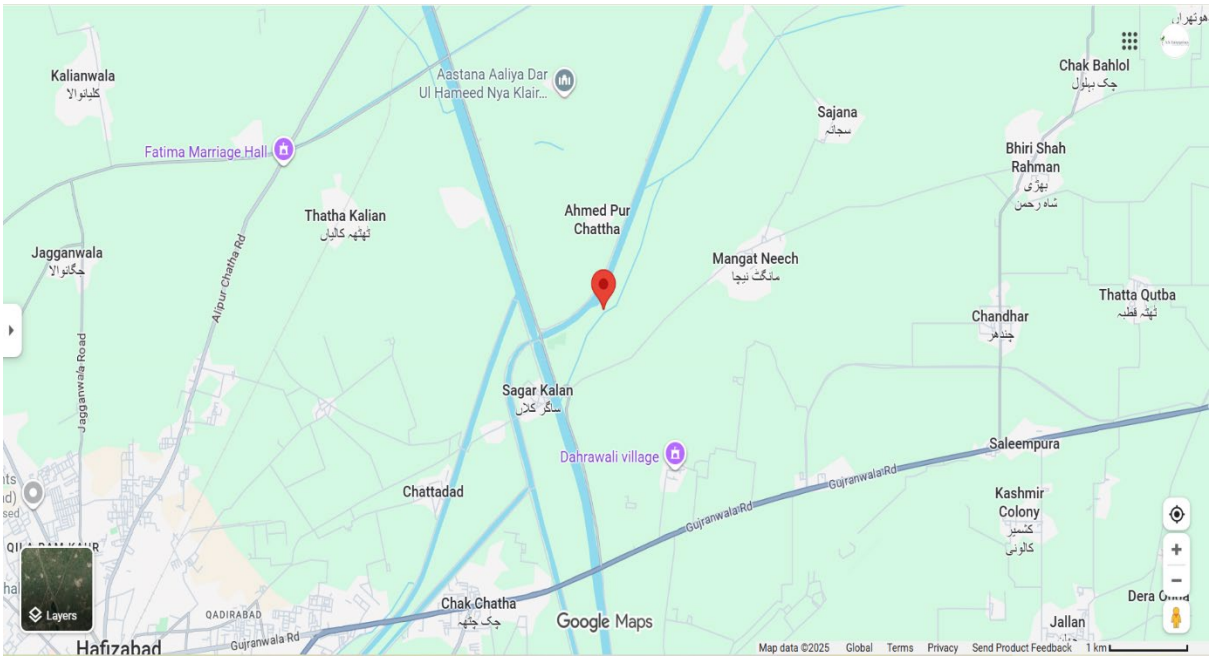
East: Open land

West: Main Head Sagar Road

Figure 3.1: Location Map of Project Site

3.7 ROAD ACCESS

In order to facilitate growing industrialization/ commercialization basic infrastructure facilities like roads network, natural gas, water and power supply, means of transportation and communications etc. are being improved/ developed speedily. The project's site is easily accessible through Main Gujrat-Hafizabad Road. The site is ideally located at easy access from Main Gujranwala Road.



3.8 VEGETATION FEATURES OF SITE

Proposed project site is situated near the head sagar. There is no forest or any type of flora worth mentioning around the project area. General trees, grasses and shrubs exist on the cultivable land nearby; details of vegetation features are covered in Chapter 4 – Description of Environment. However, this is worth mentioned that there is no tree cutting involve in the proposed project as the site is devoid of any tree. However, vivacious tree plantation is planned to be carried out by project management which will enhance the aesthetic value of the proposed facility.

3.9 ENERGY/ POWER SOURCE

The total electric requirement for the proposed project is 100 kVA for whole of operations at full capacity. This energy needs will be fulfilled by Electric Supply Company as an electricity source. Generators of 100 kVA capacity will also be installed to fulfill the electric requirements at the time of its shortage.

3.10 WATER REQUIREMENT

Adequate quantity of underground water is available to meet even all the project

requirements. The quality of water is also satisfactory. This factor also supports the decision regarding sitting of the project at the existing site.

It is projected that around 200 – 300 Gallons of water will be used on daily basis during construction of the said project. Water requirement of the proposed project will be met via extraction with installation of electrical water pumps. It is estimated that about 150-gallon day of the water will be needed during regular commissioning phase of proposed project. It is worth mentioning that proposed project doesn't involve process water; the stated quantity of water will be required for sanitation purposes/ allied activities by workers only. Therefore, this negates the major concern of effluent generation as well.

3.11 SOLID WASTE

There is no much trash generating process is involved in said project. General municipal waste of ~ 5-7 kg/ week will be produced from the staff/ workers in the form of used paper, stationery items, used bulbs, tubes, broken glass, plastic and wood, waste packings/ medicines which is basically recyclable/ reusable. This solid waste will be managed by project proponent through licensed contractor to be disposed-off at approved waste disposal site.

3.12 PROJECT COST & MAGNITUDE OF OPERTAION

The estimated capital cost of the proposed project is about PKR 500 million including installation and operational budget. The quantities have been worked out from the design drawings. The rates for cost estimates are based on construction work, contractor cost and cost of the equipment/ machinery with 10% escalation. At operation stage, the project proponent will be involved for operation and maintenance of the proposed facility.

The development under reference of this EIA will be spread on an area of 11 kanals & 15 Marlas. Components of the proposed project are already described in the earlier part of this report.

3.13 SCHEDULE OF IMPLEMENTATION

Proposed project is settled for Environmental Approval to start its implementation. It is planned that the following schedule of project implementation will be adhered to. This is subject to the conditions that everything goes according to planning and no serious bottlenecks are encountered. The implementation stages of the project activity include[1]:

Stage I (may., 2026)

The stage–1 comprises the onsite contouring studies and soil investigations.

Stage II (June. – july., 2026)

The stage –2 comprises the following task:

i- Laying of foundations excavation and commencement of erection work.

ii- Start of civil, electrical and mechanical work.

iii- Construction of basic infrastructure.

iv- Fitting of instrumentation, tanks and other necessarily stuff.

Stage III (Aug, 2026)

The stage –3 comprises the following task:

i- Equipment erection completion.

ii- Completion of the basic infrastructures water, electricity & fuel supply system etc.

Stage IV (Sep., 2026)

The last stage will be Commencement of Regular Operation of the proposed Project facility.

[1]*All dates/ periods for project start are tentative and likely to change depending upon the circumstances.*

3.14 DESCRIPTION OF THE PROJECT

The project has been duly described at: "1-Introduction- Nature and size of the project- Purpose of the report, identification of the project and the project proponent." Besides, a Retail Outlet is not just a place for meeting fuel needs. It offers a range of services which can be classified as under:

- **Mandatory Facilities:** The LPG Storage and Filling Plant is designed to provide all essential facilities in compliance with safety and operational standards. The plant is established on a total land area are 11 kanals & 15 Marlas currently allocated for Construction site. Facilities include the display of working hours, contact details of the concerned company personnel for customer assistance, and the provision of safety equipment as per statutory requirements, such as fire extinguishers, sand buckets, First Aid Box, and sanitary facilities, ensuring both safety and convenience for plant staff and visitors.

Construction of an LPG Storage and Filling Plant involves the following key components:

1. Installation of LPG Storage Tanks:

- Locally fabricated stainless-steel tanks tested to 250Psig @150°F. pressure during Design Press.@Temp and Operational. Press.@Temp is 150Psig @120°F
- Interstitial monitoring system is installed on all LPG storage tanks for early leak detection.
- Storage tanks are installed above ground on saddle supports within a properly designed bunded (containment) area, as per layout specifications.
- Tanks' internal and external surfaces are protected with epoxy-based coatings or equivalent for corrosion resistance, with a specified corrosion allowance of 1 mm.

- Overfill prevention devices are fitted to ensure operational safety during filling

2. Pipework Installation

- **Fill/ Dip pipes** are commonly used in LPG storage tanks to fill the tank and take readings (such as LPG levels)
- These pipes ensure the proper delivery of LPG to the tank and are standard in LPG storage systems.
- **Suction systems** are used for transferring LPG from the storage tank to filling stations or other connected systems. These systems are essential for both **LPG transfer** and **safety monitoring**.
- Fuel lines to have secondary containment for fuel lines is a standard requirement in LPG storage and filling plants to ensure safety in case of a leak or spill.
- This system helps contain any potential leakage, ensuring safe operation of the facility.
- Interstitial space pressure testing and monitoring is a commonly used safety measure.

3. Monitoring System

- Continuous monitoring of interstitial spaces between tanks
- Continuous tank gauging
- Interstitial space monitoring in fuel lines for hydrocarbon vapors

4. Other Requisites

- Dispenser sumps fitted with monitoring systems
- All sump to be provided with steel covers
- Sufficient fire-fighting equipment to be provided at site
- No natural gas pipeline exists within radius of 50' – 0" radius of the site

3.15 DESCRIPTION OF THE PROCESS

Vehicle and equipment fueling procedures and practices must be designed to minimize pollution of surface or ground waters. Understanding the procedures for delivering fuel into vehicles, mobile fuel tanks, and storage tanks is critical for this purpose. Safety is always the priority. The following procedures shall be implemented at all maintenance yards with fueling.

▪ **Standards and Specifications (for vehicle and equipment fueling)**

- Shut the engine off

- Ensure that the fuel is the proper type of fuel.
- Absorbent spill clean-up materials and spill kits shall be available in fueling/defueling areas and on mobile fueling vehicles and shall be disposed of properly after use.
- Fuel tanks shall not be "topped off."
- Whenever practical, vehicles and equipment shall be transported to the designated fueling area in the Facilities area.
- Clearly post, in a prominent area of the facility, instructions for safe operation of fueling equipment, and appropriate contact information for the person(s) responsible for spill response.

▪ **Standards and Specifications (for bulk fueling)**

- Drip pans or absorbent pads shall be used under all hose and pipe connections and other leak-prone areas during bulk fueling.
- Block storm sewer inlets, or contain tank trucks used for bulk transfer, with temporary berms or temporary absorbent booms during the transfer process. If temporary berms are being used instead of blocking the storm sewer inlets, all hose connection points associated with the transfer of fuel must be within the temporary berms during the loading/unloading of bulk fuels.
- Protect fueling areas with berms and/or dikes to prevent run-on, runoff, and to contain spills. A trained employee must always be present to supervise during bulk transfer.

▪ **Spill Response**

- Conduct cleanups of any fuel spills immediately after discovery.
- Uncontained spills are to be cleaned using dry cleaning methods only. Spills shall be cleaned up with a dry, absorbent material (e.g., kitty litter, sawdust, etc.) and absorbent materials shall be swept up.
- Collected waste is to be disposed of properly.
- Contact Security.

▪ **Maintenance and Inspection**

- Fueling areas and storage tanks shall be inspected monthly.
- Keep an ample supply of spill cleanup material on the site.
- Any equipment, tanks, pumps, piping and fuel dispensing equipment found to be leaking or in disrepair must be repaired or replaced immediately.

General managing system of **LPG Storage and Filling Plant** is illustrated via flowchart below:

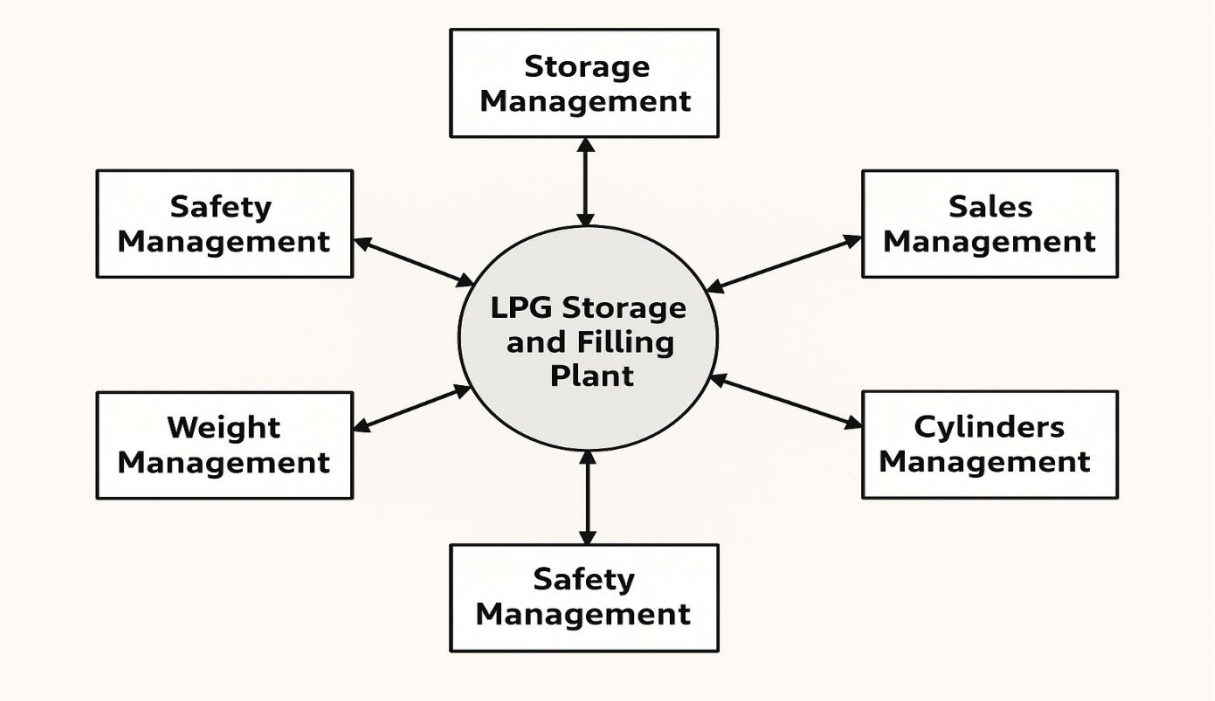


Figure 3.3: Flowchart of LPG Storage and Filling Plant Management System

3.16 DETAILS OF RESTORATION & REHABILITATION PLANS

The estimated life of the first phase of the project is 25 years. Much before the project approaches end of its first life cycle it will be completely renovated, refurbished and even new/ latest state of the art machinery/ equipment will replace the old one. All civil structures and related infrastructures will be extensively renovated. Even during its first life cycle, preemptive modifications, replacements and refurbishing will be carried from time to time under the "order of the day principle". This will ensure enhancement of the life of the project at very nominal costs. In this way, the project life will be further enhanced for another twenty-five years or so.

All activities will be carried out in accordance with prevailing environmental management laws and controls so as to avoid any damage to any segment of environment or human health around the project site.

3.17 GOVT. APPROVALS AND LEASES REQUIRED BY THE PROJECT

Project Proponent has accorded approvals/ certifications for their project from all relevant regulatory bodies successively. Approvals obtained from different departments so far are enlisted as under:

1. Approval from Civil Defense Department regarding fire-fighting arrangements/

equipment

2. Approval from Chief Traffic Officer
3. NOC from TMA
4. Approval from Additional Deputy Commissioner
5. License from OGRA

All of these approvals have been provided under Annexure-VII of this document. So far, the Environmental Approval from the EPA, Punjab, Lahore is the major requirement for which this EIA report has been prepared and submitted.

CHAPTER-4

DESCRIPTION OF ENVIRONMENT

4.1 GENERAL

This Section of the report covers a comprehensive description of the baseline conditions of the project and its related influence area with respect to the physical, biological, and social aspects. In addition to the secondary data, the field survey was carried out in first week of march, 2025 and the environmental baseline conditions were established based on socioeconomic interviews[2]; impact location profiles; environmental profile questionnaires and public consultations.

4.2 PHYSICAL RESOURCES

Following is a brief description of various physical resources of the Project Site.

4.2.1 Topography, Geology & Soil

Proposed project site is located at **32°06'22.4"N 73°45'21.9"E** Project site is at distance of 01 km from the Head Sagar. The proposed project area is situated at Khewat No.16 & 50/3 Khatooni No. 47 to 52 & 127, Khasra No. 713/1, 715/1 & 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad.

The proposed site is located within the tehsil & district Hafizabad**,** situated in the northern region of Punjab, Pakistan**,** near the eastern border with India. The entire district is a flat alluvial plain. It can be divided into 2 parts: the low-lying alluvial lands, fringing the River Chenab called Uthar, and the upland area lying at a distance from the low-lying areas of the River Chenab called Hithar.

There are no hilly areas in the district. River Chenab passes through the district and forms its northwestern boundary. The Uthar areas are subject to river floods which are extensive due to the loose texture of the soil on its banks. The deposits of River Chenab are sandy. The area lies on the fertile plains formed by centuries of alluvial deposition, primarily from the Chenab River. The terrain is predominantly flat with slight undulations and has an average elevation of approximately 208 meters above sea level**.** Surface soils mainly comprise sandy silt, clay, and loam, making the land suitable for both agriculture and construction. Beneath the surface, interbedded layers of sand, silt, and clay influence the geotechnical characteristics and groundwater dynamics. The groundwater aquifer in Hafizabad is embedded within these alluvial deposits and serves as a crucial resource for both domestic and industrial use. Overall, the soil and subsoil conditions in this urban setting are generally favorable for development, subject to standard geotechnical investigations and site-specific preparation. The area's soil and subsoil conditions are favorable for construction,

provided standard geotechnical assessments and site preparations are carried out.

Brief demographical profile of city is mentioned in Table 4.1 below.

Table 4.1 Demographic profile of Hafizabad

Item	Unit	Value
Total area of the district	Sq.km	2347
Tehsils	Number	2
Density	Sq.km	548-640
Union Councils	Number	50
Total population of the district (census 2023)	Number	1,319,909
Population (male)	Number	670,023
Population (female)	Number	649,826
Literacy rate of the district	%	65.77
Average household size	Number	6.7

Source: Hafizabad Tehsil & District: district in Punjab Province, Pakistan

[2]Households resided in the vicinity of the project area, selected randomly and interviewed.

Soils play a significant role in shaping the local environment, both through their inherent physical properties and their contribution to fertility. In the project area, the soils are primarily alluvial in nature, deposited by the Chenab River system over time. Due to seasonal flooding and sediment deposition, strongly developed and mature soil profiles are limited, with textures varying from silt-loam to clay-loam. Soil samples from the area typically exhibit a silt and clay composition of around 40-50%, supporting moderate to high agricultural productivity.

The project site does not contain any commercially valuable mineral deposits. Subsurface layers generally consist of coarse sand, pebbles, and clay, indicative of historical fluvial alluvium deposited by shifting river channels of the Indus. The topsoil is typically composed of fine silt or loam, often referred to as loess, which enhances both water retention and fertility. These soil layers are common throughout the floodplains of southern Punjab.

4.2.2 Hydrology

River Chenab, which flows along the north and northwestern boundaries of the district, is the district's only river. It leaves a lot of fine silt on riverine areas after floods. The nullahs and streams of the district include Nullah Wagh and Buddhi Nullah (both of which are tributaries of River Chenab). Other nullahs include Sukhnain Nullah, Vugh Nullah, Rohi Nullah, and Halki Nullah.

There is a marshy area along River Chenab which provides sanctuary to many

migratory birds. one part of Head Sagar headworks/ barrage reservoir falls under the jurisdiction of Hafizabad district while another part is in that of Gujrat district. The hydrogeology of Hafizabad Tehsil & District is predominantly influenced by the alluvial deposits of the Chenab River. These unconsolidated sediments, comprising layers of sand, silt, and clay, extend to depths of approximately 900 to 1,000 feet, forming a substantial and continuous aquifer system. Groundwater recharge in Hafizabad is primarily driven by seepage from unlined canals, distributaries, and watercourses associated with the region's extensive irrigation infrastructure. While direct recharge from rainfall remains limited due to semi-arid climatic conditions and low annual precipitation, continuous agricultural irrigation plays a critical role in maintaining groundwater levels across the district. The depth to the water table in Hafizabad varies seasonally, generally ranging between 5 to 14 meters below ground level, with shallower depths observed in areas with intensive irrigation practices. ScienceDirect Groundwater quality in Hafizabad District is generally suitable for irrigation purposes, although certain areas exhibit elevated levels of salinity and other contaminants. Regular monitoring and management are essential to ensure the sustainability of groundwater resources in the region.

Underground Water

The groundwater table in the Hafizabad District is generally found at a depth ranging from 10 to 15 meters. A network of both municipal and private wells taps into groundwater, with some wells extending to depths of up to 200 meters, primarily extracting water from quaternary alluvial deposits. These alluvial sediments are water-bearing, providing significant groundwater resources across the region. The local population in Hafizabad heavily relies on hand pumps for drinking water supply, particularly in rural areas. The chemical quality of groundwater varies depending on the specific location and depth, with some areas offering potable water, while others experience issues with brackish or saline water. Table 4.2 shows the number of diesel and electric Tube wells installed in district.

Table 4.2: Diesel and Electric Tube wells

Total Number of Wells	Government	Private
27,539.0	46.0	27,493.0

The chemical quality of groundwater is:

- Generally fresh along the banks of the Chenab River and its tributaries.
- Brackish/saline in the central parts of the district, especially in areas near the Doabs, where the Chenab and Ravi rivers converge.

The poor quality of shallow groundwater in some areas is primarily due to waterlogging caused by historical irrigation practices. However, at greater depths (up to 450 feet), impervious clay layers form a barrier between the saline shallow aquifers and the deeper fresh groundwater reserves. This layering helps improve water quality with depth, where fresh groundwater is more readily available. Therefore, the groundwater quality in the Hafizabad project area generally improves with depth.

Surface Water/Wet Lands

The Chenab River and its tributaries are the primary sources of both groundwater recharge and surface water supplies in the Hafizabad District. Local streams and watercourses feed into this river system, further supporting water availability in the region. While Hafizabad does not have major dams like Rawal or Sambli in the immediate vicinity, water from the Chenab River and various irrigation canals is crucial for both agricultural irrigation and local consumption. These water sources are distributed through an extensive network of canals and watercourses, which supply water to both semi-urban and agricultural areas. This interconnected system ensures that water resources are available throughout the year to meet the district's needs. Furthermore, map of water supply system in Hafizabad is presented as Figure 4.1.

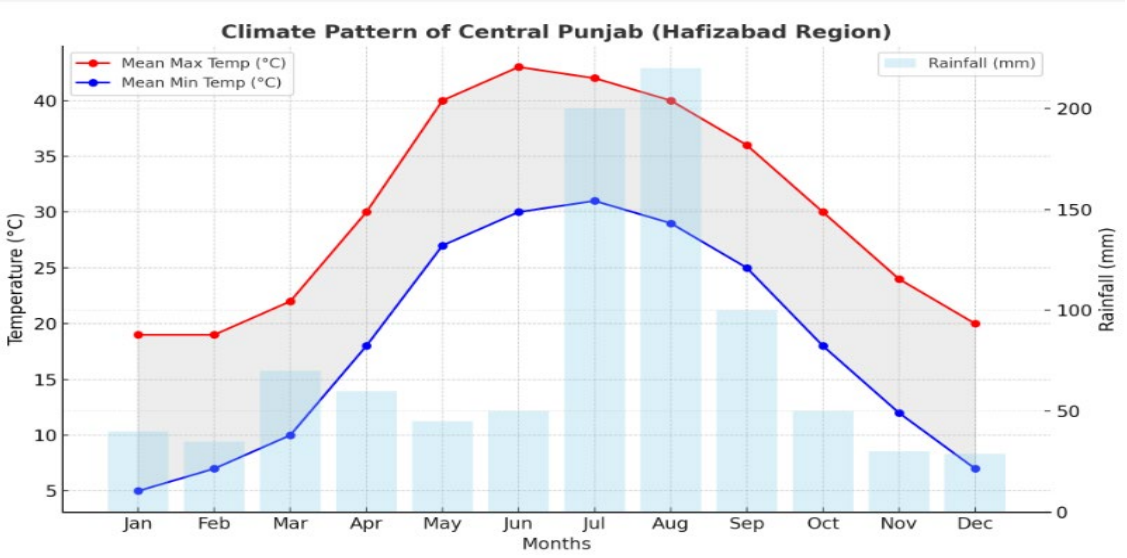
4.2.3 Seismicity

The Seismic Zoning Map of Pakistan, showing the proposed project site area, is presented as Figure 4.2. This map indicates zones according to the Building Code of Pakistan (2007). The project site is located in Hafizabad District, which falls under Seismic Zone 2B according to the seismic zoning guidelines of Pakistan. Zone 2B represents a moderate seismic risk and corresponds to a Peak Ground Acceleration (PGA) range from 0.16 to 0.32g. Additionally, Figure 4.3 presents the WHO Seismic Hazard Map of Pakistan, which illustrates the PGA for a 500-year return period. The intensity level in this region is categorized as moderate.

4.2.4 Climate

The climate is typical of the central Punjab region. It is hot and dry during the summer and moderately cold in the winter. Owing to the proximity of the hills, there is more rainfall in the eastern part than in the western part of the district. The summer season starts in April and continues till October. May, June, and July are the hottest months. The mean maximum and minimum temperatures in summer are 40 °C and 27 °C respectively,

but the temperature can go up to 48 °C. The winter season starts in November and continues till March. December, January, and February are the coldest months. In winter, the mean maximum and minimum temperatures are 19 °C and 5 °C respectively. The rainy season starts in July and ends in September. Average annual rainfall during the period 1961-98 was about 629-980 mm. More rains occur in July and August than in any other month. Most of the winter rains are received in the months of March and April.



Temperature

Over the course of a year, the temperature typically varies from 5°C to 30°C and is rarely below 2°Cor above 44°C. At an average temperature of 33.7 °C, June is the hottest month of the year. The lowest average temperatures in the year occur in January, when it is around 12.2 °C. Further details of mean high and low temperatures recorded for the year 2018 are presented in Table 4.3 and illustrated in Figure 4.4 below.

Table 4.3 & 4.4: Month-wise Mean Min. & Max. Temperature (°C)

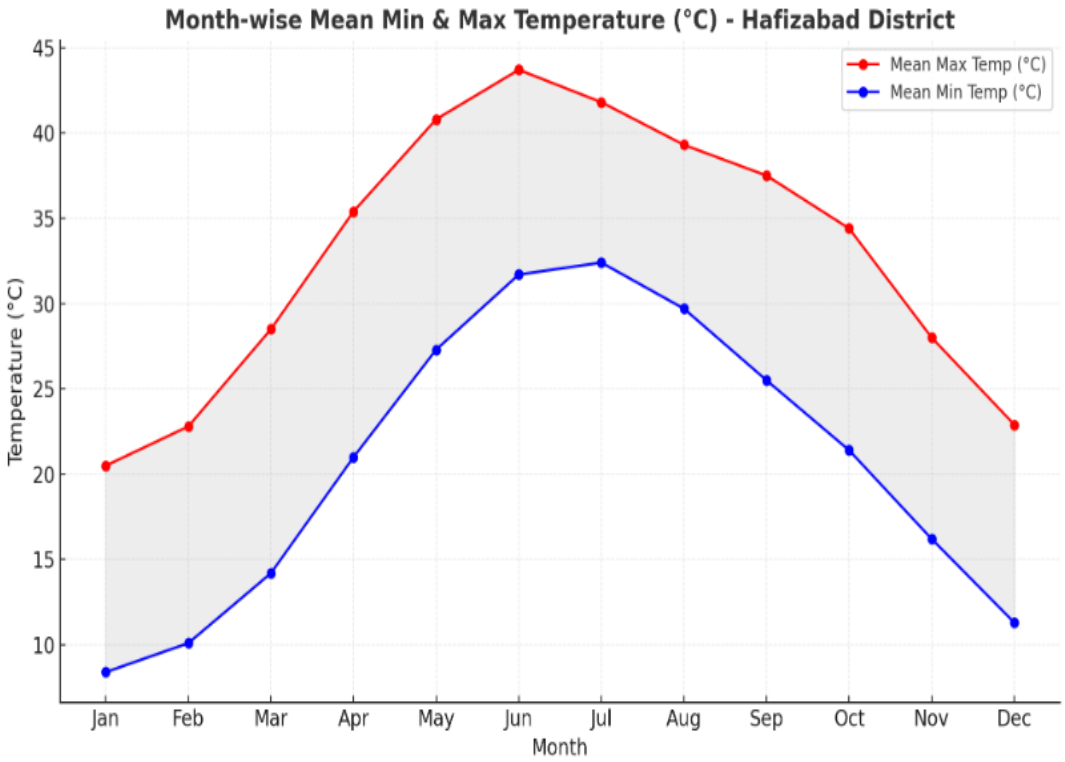


Figure 4.1: Water supply system in Hafizabad

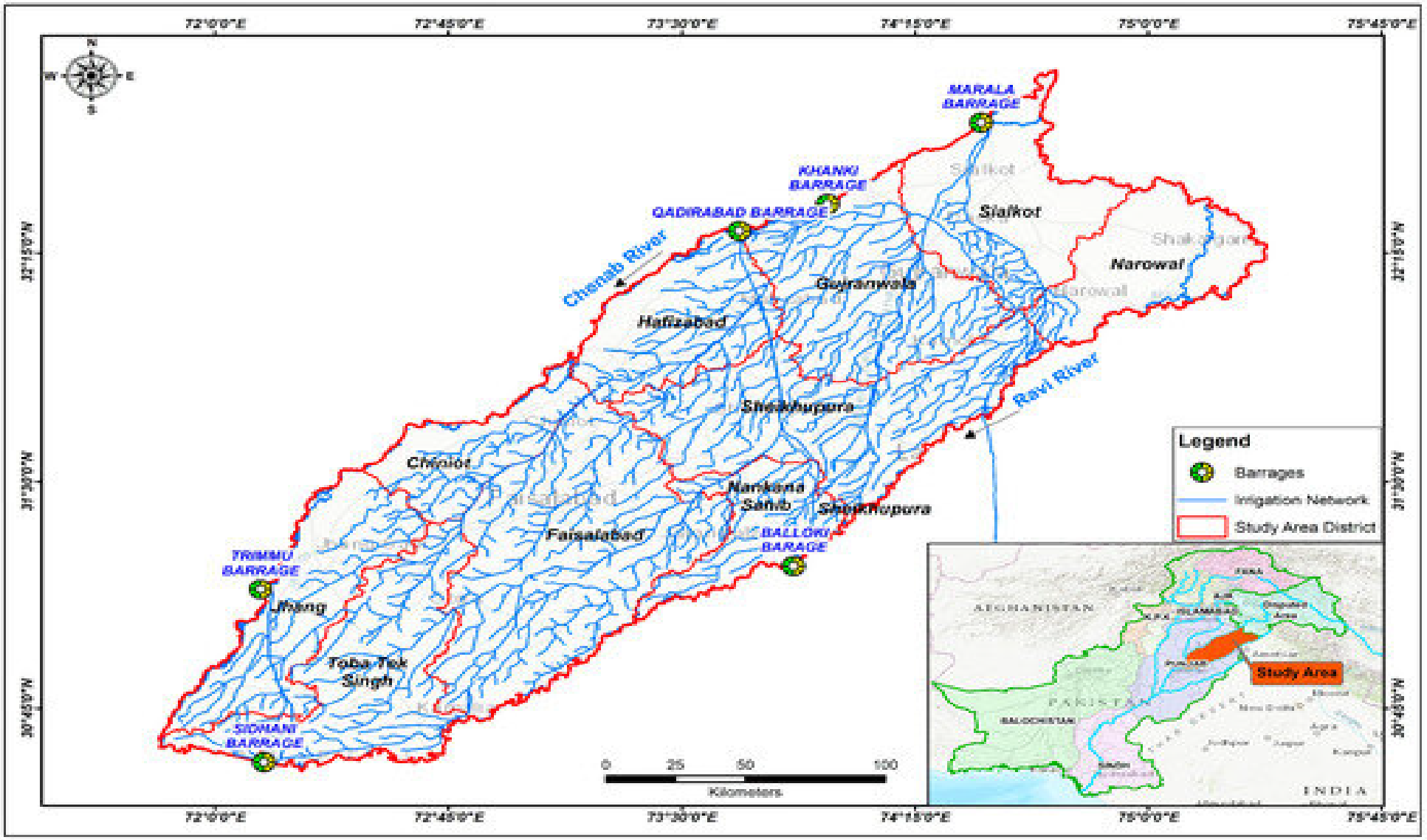


Figure 4.2: Seismic Zoning Map of Pakistan

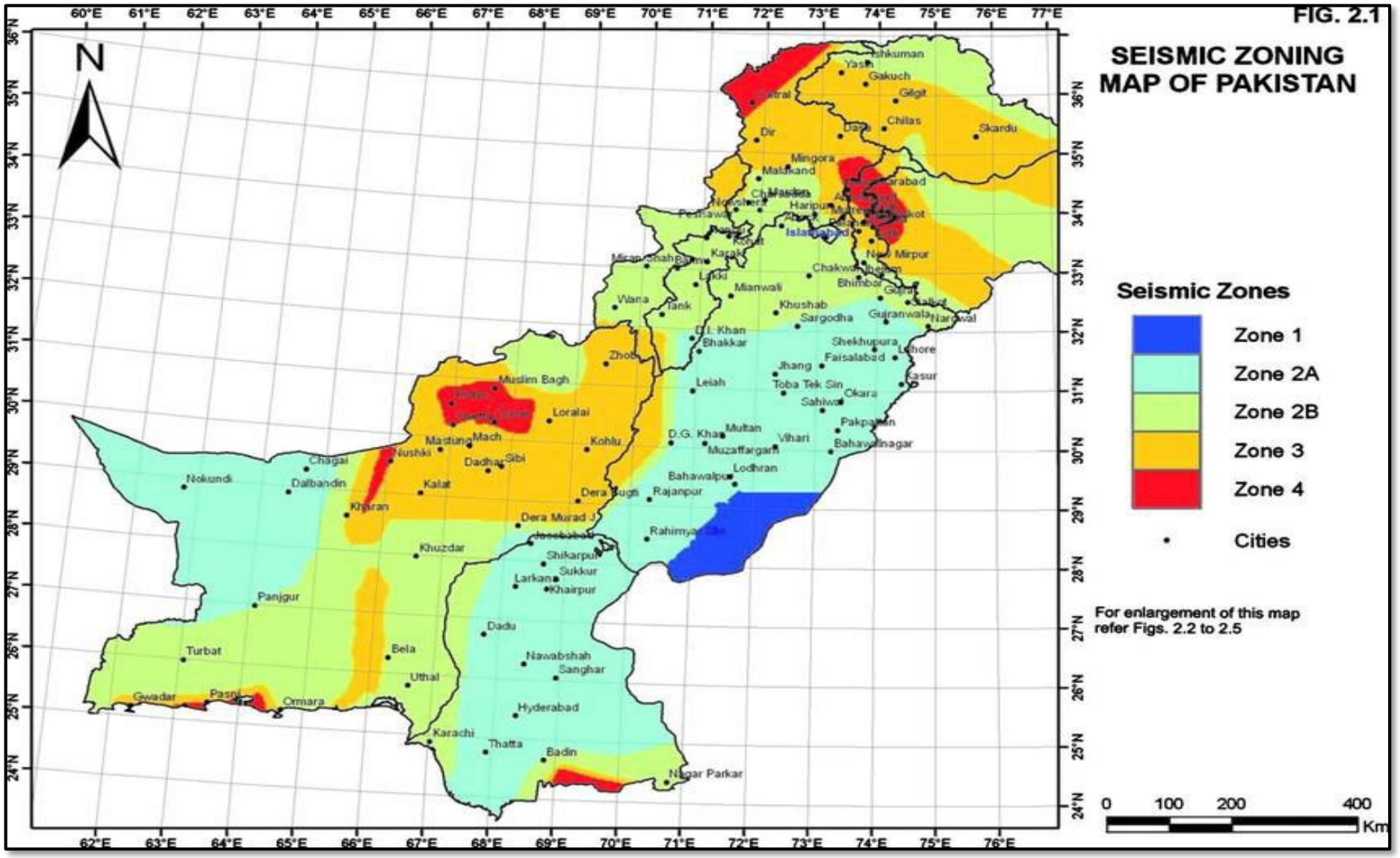


Figure 4.3: WHO Seismic hazard map of Pakistan

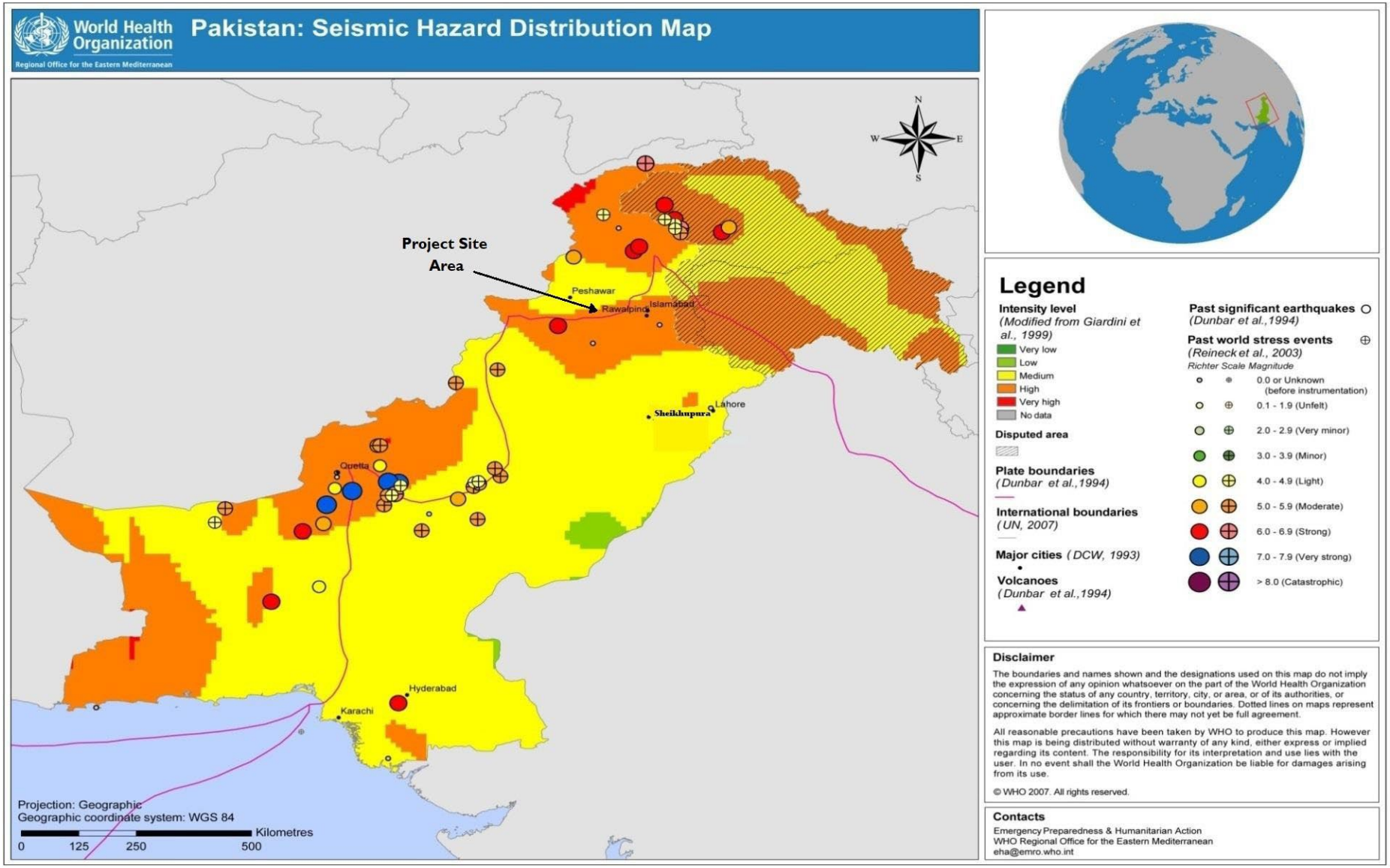
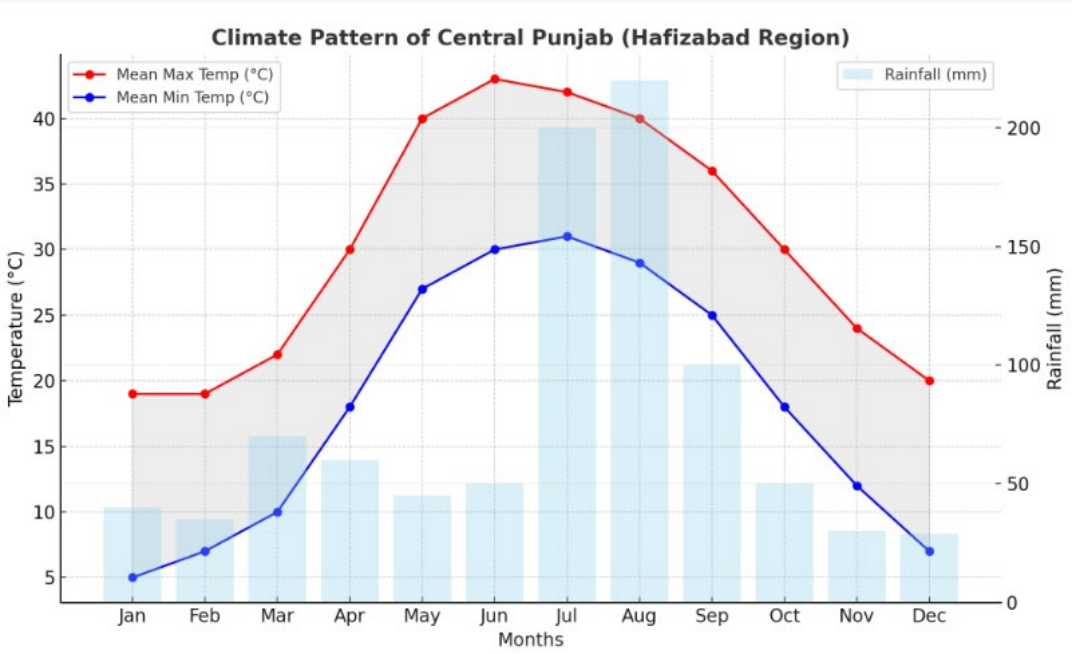


Figure 4.4: Month-wise Average Min. & Max, Temp.

Source: www. Meoweather.com



Humidity

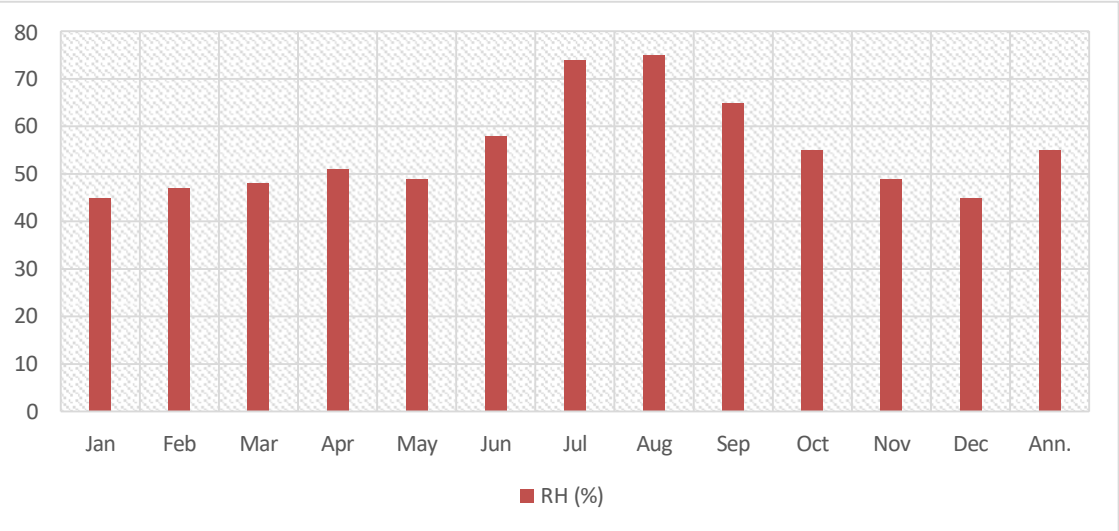
The humidity variation in the year 2018 from January to August in project area ranges from 45% to 75%. Month-wise relative humidity values are shown in Table 4.4.

Table 4.4: Month-wise Relative Humidity

RH (%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
	45	47	48	51	49	58	74	75	65	55	49	45	55

Source: Myweather2, 2025 (Website).

Figure 4.5: Month-wise Relative Humidity



climate in this region is warm and temperate. When compared with winter, the summers have much more rainfall. The rainfalls mainly occurred during the months of

July, which is commonly known as monsoon month. The wettest month (with the highest rainfall) is July (237mm). The driest month (with the lowest rainfall) is November (16mm). Month-wise total rainfall is presented in table 4.5.

Table 4.5: Month-wise Total Rainfall (mm)

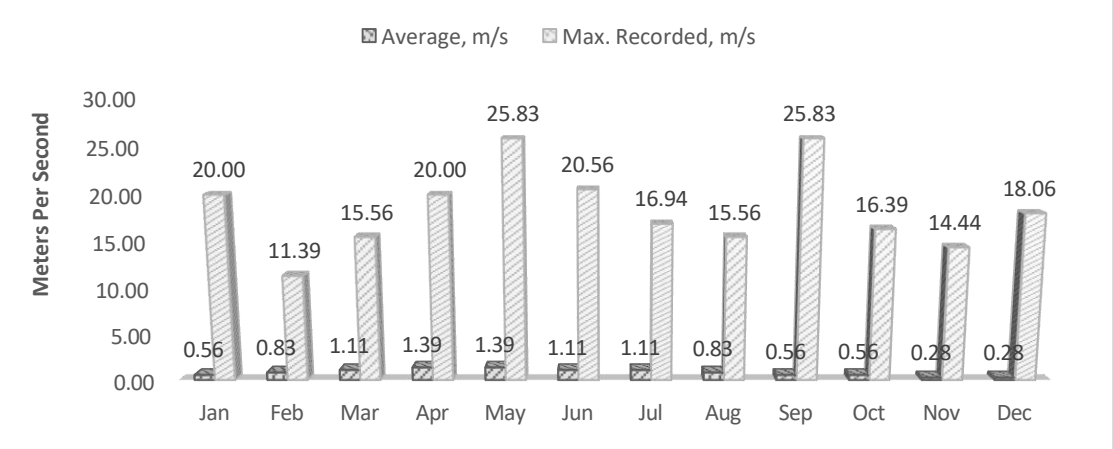
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Rain-fall	58	56	68	44	38	37	237	236	92	23	16	36	941

Source: mymeather2.com 2018 (website).

Wind Direction

The predominant wind direction is from South-West (SW) to North-East (NE) directions. The average and maximum wind speed for District Hafizabad is indicated in Figure 4.6.

Figure 4.6: Average and Maximum Wind Speed



4.3.1 Biodiversity

Biodiversity has an important role in the functioning of the ecosystem. Human being is one of the species of the ecosystem and that species is the end user in the food chain. Fauna and flora are the important components of the ecosystem. The observed species of fauna and flora at the project site are described below.

4.3.2 Forestry (Flora)

Native plants of the Punjab have been restricted to the graveyards and other protected sites/area. The observed flora in and around the project area is being mentioned below.

a) Kikar (Acacia arbica),

b) Beri (Zizyphus jajaba),

c) Shisham or Tali (Dalbergia sissoo)

4.3.3 Wildlife (Fauna)

Birds including sparrows and crows were observed in the vicinity of the project area. And during the interview of the local peoples, they reported the presence of jackal's and dogs in the night.

4.4 SOCIOECONOMIC ENVIRONMENT

The socioeconomic environment is one the component of the regional ecosystem. The development projects can impact either negatively or positively to the regional socio-economic environment. The socioeconomic environment is one the component of the regional ecosystem. The development projects can impact either negatively or positively to the regional socio-economic environment.

4.4.1 Population & Communities:

The population of Hafizabad is predominantly Muslim, accounting for approximately 95.5% of the total. In rural areas, the majority of residents belong to castes such as Abbasi, while other significant caste groups include Rehmani, Gujjar, Jatt, and others. Punjabi is the most widely spoken language in the district, representing about 71.6% of the population, followed by Urdu at 10.1%, Pashto at 9.5%, and Siraiki at 1.1%, along with other regional dialects. Field surveys conducted in the project area and its surroundings indicate that the settlement pattern is largely semi-urban, with a significant portion of the population belonging to the lower middle-income group. A smaller segment of the population lives below the poverty line. There is a growing awareness about the importance of education, which is evident from the increasing number of school-going children in the area. Easy access to print and electronic media is also playing a significant role in transforming social attitudes and lifestyles. Despite the gradual shift towards modern living, a large segment of the population continues to adhere to traditional customs and practices. Elders hold a highly respected position within the family and community, and their guidance is considered vital in all important decision-making processes. Traditional hospitality is deeply embedded in the local culture, and old customs are both valued and practiced in day-to-day life. The field survey, which included interviews, focus group discussions, a census, and the development of an area profile, was conducted to gather comprehensive socioeconomic data from both the project-affected population and the surrounding communities. This baseline information will serve as a reference for future monitoring and evaluation studies. The demographic features of the area encompass household profiles, gender composition, occupational patterns, and literacy levels, providing a

well-rounded understanding of the population residing in and around the project site.

The information relating to the demographic profile of the people in the project area are described below.

Family Size and Gender Composition

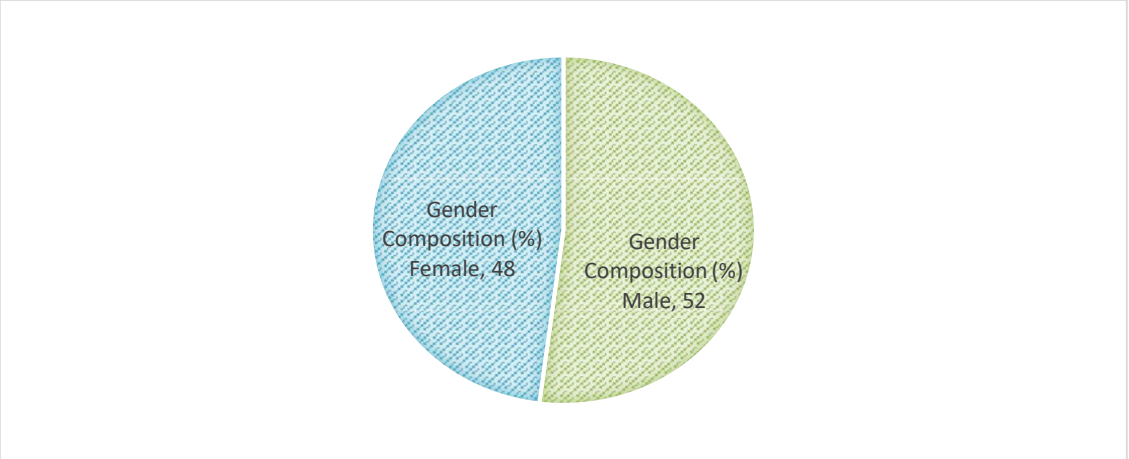
Based on the field survey of sample affected people/ local population, the average family size computed to be 6.2, out of which the proportion of male and female members is 52.0% & 48.0 % respectively as shown in Table 4.6 and Figure 4.7.

Table 4.6: Average Family Size & Gender Composition

Average family Size (No.)		
Gender Composition (%)	Male	Female
6.2	52.0	41.0

Source: Pakistan Bureau of Statistic

Figure 4.7: Gender Composition

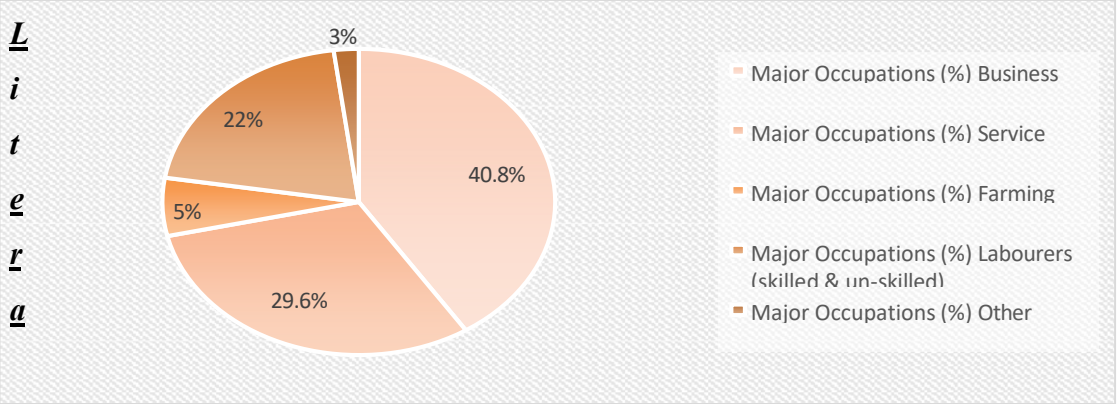


In the vicinity of the project area in Hafizabad, the surveyed population is engaged in a range of occupations to sustain their livelihoods. A significant portion, about 50.8%, is involved in self-owned small businesses such as local shops, general stores, and agricultural input supply outlets. Around 29.6% of the population is employed in various public and private service sectors, including teaching, clerical work, and transport services. Given Hafizabad's strong agricultural base, 5.12% of the respondents reported farming as their primary source of income, cultivating crops such as wheat, sugarcane, cotton, and fodder. Additionally, 10.41% of the population is involved in labor, both skilled and unskilled, supporting the agriculture and construction sectors in the region. Another 5.05% are daily-wage laborers or are involved in other informal jobs, depending on seasonal demand. The detailed breakdown of the occupational structure of the sampled population residing in the Hafizabad project area is presented in Table 4.7 and illustrated in Figure 4.8.

Table 4.7: Major Occupations of the Sample Population

Major Occupations (%)				
Business	Service	Farming	Laborer (skilled & un-skilled)	Other
40.82	29.60	5.12	10.41	5.05

Figure 4.8: Major Occupations of Sample Population



Status

The field survey has shown that on the whole, in the vicinity of the project site, the average literacy rate of the local population estimated as 61.98%. The percentage of literacy rate among males and females residing in the vicinity of the project area is computed to be 68.53% and 52.55% respectively. The literacy rate of male and female population in project vicinity, urban and rural area is shown in table 4.8 and educational institute present nearby is shown in table 4.9.

Table 4.8: Average Literacy Rate of the Sample Households

Literacy rate	Male	Female
Project vicinity	68.53%	52.55%
Urban	60.41%	39.59%
Rural	80.67%	19.33%
Overall District	65.8%	34.2%

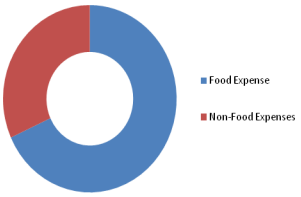
Note: This is the average literacy rate of population resided in the vicinity of project site.

Table 4.9: Educational Institutes nearby Project Area

School Name	Distance from Project Site
Govt. Public School & College	~10.6 Km
5 Govt. Boys & Girls High School	~10-13 km

Average Household Expenditure

The annual expenditure and pattern of expenditure provides an indication for assessing standard of living of a household. The expenditure on food items includes



cereals, pulses, flour, sugar, cooking oil/ ghee, milk etc., while the non-food items including the expenditure on education, medical treatment, clothes, shoes, cosmetics.

The proportion of expenditure incurred on food and non-food items is 70% and 30% respectively.

4.4.2 Industries

The project site is located along 1-km away from head sagar in Hafizabad, which is a semi-urban area characterized by agricultural activity and small-scale businesses. The local economy along this route is primarily dependent on farming, fruit orchards, and trade, with honey production being one of the supplementary income sources for a number of households in the surrounding rural communities. Beekeeping is practiced on a small to medium scale in the area, especially near orchards where flowering fruit trees and mustard crops offer rich nectar sources for honeybees. Locally produced honey is sold both directly in nearby markets and through small vendors. This activity contributes to the livelihoods of local families and is gradually gaining popularity as awareness about its commercial value increases.

4.4.3 Infrastructure

During the field survey, the availability and access to basic infrastructure and services for the local population of Hafizabad were carefully recorded. It was observed that the majority of the population residing in the vicinity of the project area has access to essential services including educational institutions, healthcare facilities, electricity, mobile and landline communication, road connectivity, and fuel stations. According to the findings, approximately 96% of the local population benefits from these basic facilities, which are distributed across both urban pockets and rural settlements along the road. The area receives its electricity supply from the National Grid, under the management of the Water and Power Development Authority (WAPDA). The road network connects most of the larger villages to Hafizabad city, neighboring tehsils, and the broader provincial highway system. Even smaller link roads and farm-to-market tracks are in place, providing local farmers and residents with easier access to commercial centers and essential services. Small-scale commercial businesses such as general stores, agricultural suppliers, fuel stations, and repair workshops are also present along the main road and in nearby settlements, supporting the local economy and meeting daily needs. Cellular phone services are available in the area.

Underground water is used for drinking and other domestic purposes.

4.4.4 Transportation: Roads, Rails, Airports, Navigable Rivers

The project site is easily accessible via Main Hafizabad road, which is connected to the broader road network of Hafizabad. The area is served by a variety of private and public transport options, including vans, rickshaws, buses, and cargo trucks, which are available to a reasonable extent for both passenger and goods transportation. The project area is covered by metaled (paved) roads, ensuring year-round access for vehicles. The area receives its electricity supply from the National Grid under the Water and Power Development Authority (WAPDA). The nearest railway facility is the Hafizabad Railway Station, located at an approximate distance of 09 to 11 kilometers from the project site, which provides rail connectivity to major cities including Multan, Lahore, and Karachi. In terms of air connectivity, the nearest airport is Lahore International Airport, located approximately 120–130 kilometers from the project area, providing both domestic and international flight options. Hafizabad district is geographically located near the chenab River, which is a major water body supporting the region's agriculture and ecology. Map highlighting the transport network and irrigation channels of District Hafizabad is presented as Figure 4.9.

4.4.5 Agriculture & Mineral Development

The project area is situated in the Industrial zone of Hafizabad. Agriculture in the region is primarily dependent on canal irrigation, as well as groundwater, with the Chenab River and its tributaries being crucial for water supply. The farmers in this area tend to have medium to small landholdings, and their primary crops include wheat, sugarcane, cotton, and maize. Rice is another staple Kharif crop grown in the region, particularly in the areas with adequate water supply. In addition to staple crops, vegetables such as tomatoes, potatoes, onions, and green chilies are cultivated in areas with access to irrigation. Fruit orchards are also quite common, with citrus fruits, guava, pomegranates, and mangoes being some of the major crops. The area under fruit orchards is gradually expanding, with increasing interest in citrus farming due to its lucrative market demand. The region faces certain challenges in crop production due to factors like inconsistent rainfall and limited access to modern agricultural technology. Consequently, many farmers still rely on traditional methods of cultivation, such as shallow ploughing and minimal use of fertilizers, especially for staple crops. The adoption of modern agricultural practices and machinery is limited, except for high-value crops like potatoes

and fruit orchards. Hafizabad also has mineral deposits, though not as rich or extensive as some other parts of Punjab. There are small-scale mining activities in the region for minerals like salt and gypsum, which are used for local construction and agricultural purposes. The region's economy is also supported by local manufacturing, with industries involved in processing agricultural products, such as sugar mills and textile production, as well as cement manufacturing.

4.4.6 Public Health

There is some BHU (Basic Health Unit) which is almost 10-15 km away from the project site respectively. There are 2 private clinics (Sharif Polyclinic and Lab & Amir Safdar Clinic & Maternity Home) with proper Labs and Doctors are present in near project area. The Hafizabad abounds with medical health facilities such as hospitals, private clinics, dispensaries etc.

4.4.7 Recreational Resources & Development

No significant recreational sites were identified within the limits of the project area or in its immediate vicinity during the field survey. However, the local population does engage in community-based recreational events such as melas (festivals), which are traditional gatherings often held during agricultural seasons or religious celebrations. These events serve as key social and cultural activities for the people in the area. As such, the implementation of this project is not expected to have any significant impact on the recreational activities of the local population or community.

4.4.8 Cultural & Aesthetic Values

The field survey has confirmed that the project area has experienced ongoing growth in both the residential and commercial sectors over recent years. Religious harmony is a prominent feature of the local communities, with people from various faiths coexisting peacefully. The semi-urban setup of the area is likely to have a varied impact on the socio-economic environment, with the development of local infrastructure and services contributing to the overall improvement of living standards.

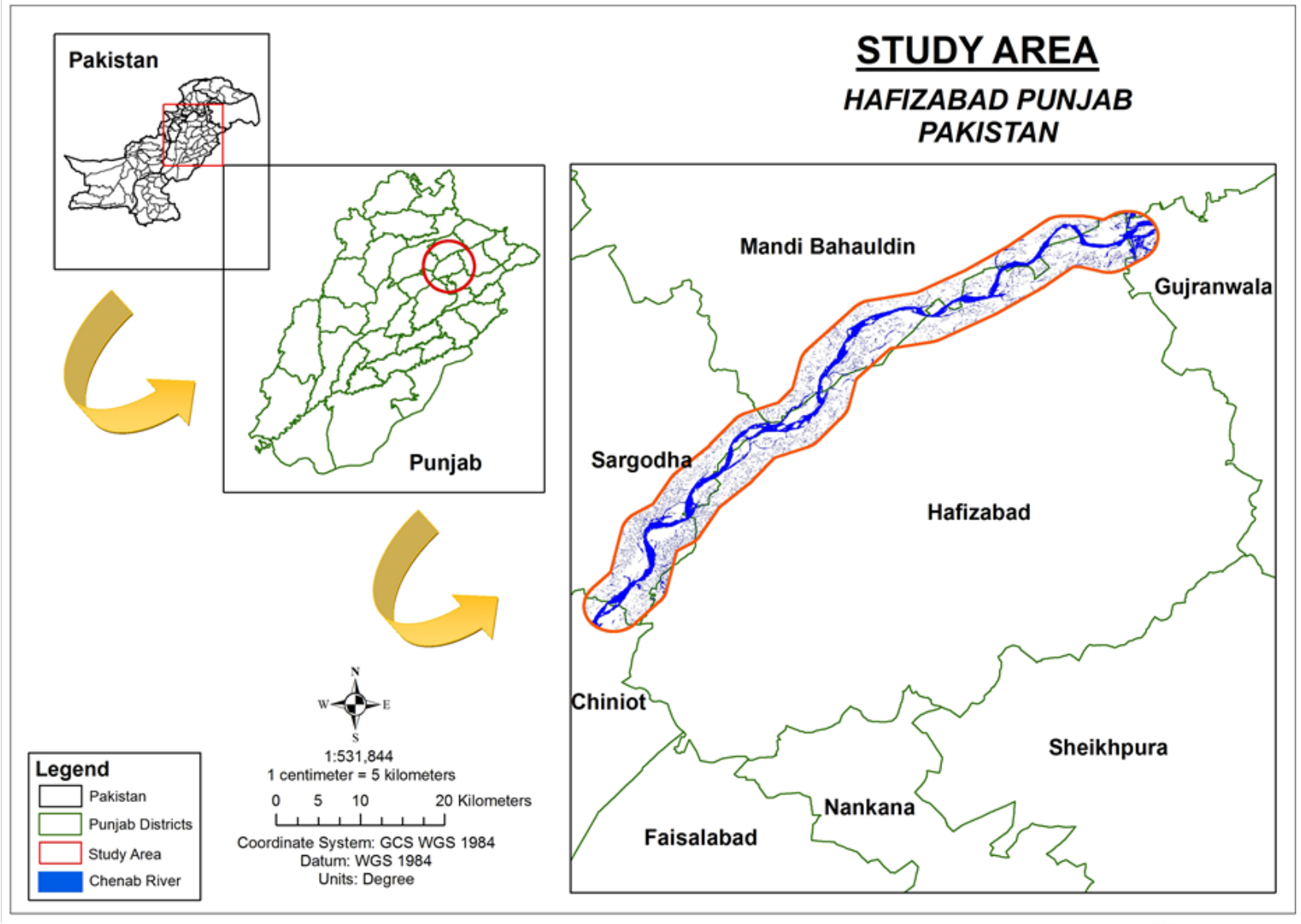
Food: The staple food of the area is wheat, rice and pulses. Inferior grains are not generally eaten. Meat is frequently eaten specially in the urban towns. Wheat (flour) is baked in the form of chapattis on an iron plate placed on the fire hear.

4.4.9 Site Suitability

During the field survey of the project area, no indigenous people, affected women

headed households and environmentally sensitive spot were observed in the project area as well as in the vicinity of the project area. Thus, there would not have any impact on the indigenous people and women headed households' due to the implementation of this project. Environmentally speaking, the carrying capacity of the environment is not utilized. The project activity, under the proposed strict operational environmental controls, is not going to leave adverse impacts on all out environment.

Figure 4.9: Map of Transport Network & Irrigation Channels, Hafizabad



4.5 BASELINE ENVIRONMENTAL QUALITY

4.5.1 Ambient Air Quality

The degradation of air quality in all the large cities is a major environmental concern these days. Air pollution levels in urban centers have either crossed safe limits given in the PEQS or have reached the threshold values. About 60 to 70 % of the deterioration in the air quality is due to the vehicular emissions. The parameters which have proved to be the major threat are particulate matter and concentration of oxides of nitrogen that are relatively higher in all the large cities of Punjab.

Atmospheric pollution, particularly in industrial areas has a strong impact on daily life. Project site is located at 01 km, Off Head Sagar, District Hafizabad where many industrial activities are already in process. Industries and vehicles are a major source of air pollution in the project area. Monitoring was conducted at the project site by using Fine Dust Sampler IPM-FDS 2.5/10µ and Ambient Air Analyzer. To record the baseline ambient air quality of the project area, monitoring was conducted at advised locations to assess the concentration of priority pollutants (Carbon monoxide, Nitrogen dioxide, Sulphur dioxide and PM10) in the air. Lab reports of Ambient Air Monitoring are attached as Annexure with the EIA report.

The result of the tests concludes that the values obtained for all of tested parameters are within permissible limits illustrated in tables below. Air Quality test report has been attached as of this report.

Table 4.10: Monitoring results of PM and Ambient Gases at project site

Reference Point	PEQS Limits	Result	Remarks
Oxides of Nitrogen as NO (ug/m^3)	40	8.2	Complies
Oxides of Nitrogen as NO_2 (ug/m^3)	80	15.2	Complies
Oxides of Sulphur as SO_2 (ug/m^3)	120	21.3	Complies
Carbon Monoxide (ug/m^3)	10	2.5	Complies
Suspended Particulate Matter (SPM)	500	124	Complies
PEQS: Punjab Environmental Quality Standards			

4.5.2 Ambient Noise Levels

Noise is generally used as an unwanted sound, or sound which produces unpleasant effects and discomfort on the ears. Noise is considered as environmental pollution, even though it is thought to have less damage on humans than water, air or land pollution. Generally, problems caused by noise pollution include stress, hearing

loss, sleep disruption etc. During the construction phase of this scheme, noise can be generated from machinery used. Traffic movement in area is considered to be the major cause of noise pollution. The noise levels were monitored during day-time by SEAL Lab. on March, 2025 noise levels were monitored with Noise Level Meter, Model OS-11.

On comparison of noise quality data with the limits specified for in ambient noise quality standards; it is evident that noise values at almost all sites are within permissible limits as presented in table below. Noise Quality test report has been attached as **Annexure** of this report.

Basic Environmental conditions: During the measurement following conditions were prevailed on workplace:

Metrological Conditions: During the noise level monitoring weather was dry and sky was clear. Air was blowing at normal speed.

Monitoring Instrument: The description of the instrument used for the noise level monitoring is given below:

Name: Digital sound level meter

Model: AR824 Company:

Intel Instruments plus Frequency Range: 31.5 Hz to 8 kHz

Noise level was monitored at four points; lab results are attached as **Annexure.**

Table 4.11: Monitoring results of Noise at project site

Reference Point	Min. dB (A)	Max. dB (A)
Eastern side of the proposed Project site	54.5	61.5
Western side of the proposed Project site	52.5	53.8
Northern side of the proposed Project site	51.55	60.7
Southern side of the proposed Project site	57.3	50.8
Centre side of the proposed Project site	51.45	62.2

4.5.3 Water Quality

Water quality refers to the chemical, physical, biological, and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and or to any human need or purpose. It is commonly compared with a set of standards against which compliance can be assessed.

The water resource in the study area includes groundwater. The groundwater is extracted by means of wells, hand pumps and electric motors. All of tested parameters for drinking water quality are within permissible limits as shown in table below. The

results of the water quality test reports have been attached as of this report.

Table 4.12: Monitoring results of Groundwater at project site

Sr.#	Parameter	Unit	Result	PEQS
1	pH	--	7.34	6.5-8.5
2	Conductivity	us/cm	657	NGVS
3	Iron	mg/l	0.21	0.3
4	Total Dissolved Solids (TDS)	Mg/l	333	<1000
5	Chloride	Mg/l	43	<250
6	Total Hardness as $CaCO_3$	mg/l	204	<500
7	Calcium	mg/l	125	NGVS
8	Turbidity	NTU	0.47	<5 NTU
9	Fluoride (F)	mg/l	0.96	≤1.5
10	Nitrate (NO_3)	mg/l	0.08	≤50
11	Nitrite (NO_2)	mg/l	0.26	≤3
12	Sodium	mg/l	52	NGVS
13	Potassium	mg/l	0.59	N.S

CHAPTER-5

PUBLIC CONSULTATION

5.1 GENERAL

This section deals with the public concerns about the said project. As already given in the previous sections, the said project is about Construction of LPG Storage and Filling Plant in Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad.

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

Consultation with the community and their active participation plays a vital role in successful implementation of the development projects. To identify the different types of stakeholders and ascertain their perception about the project, an impact assessment survey was conducted by keeping in view the requirement of *'Review of IEE/ EIA Regulations 2000'*. Stakeholders were consulted with the help of structured/ semi-structured tools. Informal group discussions were also held as an additional tool for obtaining feedback that are being discussed on the following pages.

Public consultations were carried out keeping in view the following main objectives:

- Sharing of information with stakeholders/ public on the proposed project activities and assess expected impacts.
- Understanding the stakeholder's concerns regarding the various aspects of the project, including the project technology, existing situation and the potential impacts of the project during construction and operational phase of the project.

The forums mentioned in subsequent sections were consulted. Written views and observations with particulars of people, environmental experts, and officials consulted is described comprehensively in table 5.1 and the performs filled during consultation by all stated forums is appended as of this document.

5.2 PROPONENTS' ENVIRONMENT MANAGEMENT TEAM

As stated in earlier sections, project of Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited, is in its planning phase. Once the project comes in its operational phase, a team with representatives from key management functions will be developed to assess issues, aspects, opportunities and existing manufacturing process w.r.t environment. Therefore, it is too early to substantiate the stated inscription.

5.3 THE RESPONSIBLE AUTHORITY

Proponent is responsible for the environmental impacts of this project and has taken commitment to implement the mitigation measures proposed in the Environmental Management Plan with subsequent review and approval conditions. Proponent ensured to use all practicable means consistent with other essential considerations to protect and preserve environmental quality.

5.4 OTHER DEPARTMENT & AGENCIES

About 4 people from different governmental departments such as Police, Medical Officer, EPD Hafizabad. and Agricultural consulted for proposed project. The environmental concerns and suggestions made by the officials were listed out, discussed and suggestions were accordingly mentioned in the table 5.1.

5.5 ENVIRONMENTAL PRACTITIONERS & EXPERTS

The Environmental Experts has been informed with briefing on project interventions including its benefits. All of consulted experts asked questions to get information about different components of project. About 3 experts were consulted and their recommendations have been mentioned in table 5.1.

1. Adeel Pervaiz Sr. Manager Landfill LWMC
2. Dr. Fariha Arooj, Assistant Professor UVAS
3. Dr. Mujtaba Baqir, Lecturer GCU

5.6 AFFECTED & WIDER COMMUNITY

The people of the project area are pro project installation. They are of the view that the project will enhance the economic benefits. About 20-30 persons were consulted during the public survey and majority of people consulted were of view that this project will provide employment opportunity to locals of the area. They focused on a point to encourage such projects in order to increase economic development as well as to improve living standards of area. At the same time, they foresee that project management will feel their social, moral and legal obligation and bring in Environment Management Order whereby environment will not be tempered as mentioned in table 5.1.

Table 5.1: List of participants during stakeholder consultations & concerns

Sr.#	Date	Location/ Venue/ Address	Particulars of Participants	Feedback/ Concerns
Official Consultations				
1.	04-03-2025	Private Hospital,	Mrs. Dr. Ruqaiya Rukhsar Abbasi [Women Medical Officer]	- This project going to be started really is needed by this and far-flung area too. Huge numbers of transports are using this route on daily basis. Its establishment will facilitate thousands of transport services. I recommended and favor this progressive project.
2.	04-03-2025	Private School	Mr. Abdullah Shafiq	- This project is going to be started in this area will be beneficial for many transporters. I am in favour of this type of project.
3.	06-03-2025	Post Office Hafizabad	Mr. Zafar Mehmood Abbasi	- Establishment of the proposed project is dire need of this area. And from a long time this is a public problem. With respect to public need establishment of this project should be ensure so that public can get facilitate.
4.	06-03-2025	Police Station	Iftikhar Ali Mehar	- An LPG storage and filling plant on Main Road, Hafizabad could address fuel supply issues, improve energy access, and create local jobs. However, safety and environmental precautions must be prioritized to prevent hazards.
5.	04-03-2025	Environmental Laboratory Office	Mr. Amin Baig [Assistant Director Lab]	- Environmental must be considered in planning phase and implement during installation and operation phase. Solid waste should be proper handled.
Environmental Experts				

1.	05-03-2025	UVAS Lahore	Dr. Fariha Arooj [Ass. Professor UVAS]	- There should be no harm to environment. All precautionary measures must be taken before the commencement of this project. Keep area clean during construction of LPG Storage and Filling Plant.
2.	05-03-2025	GCU Lahore	Dr. Mujtaba [Lecturer GCU Lahore]	- No construction, preliminary or otherwise relating to the project shall be started until and unless the Environmental Approval has been issued by EPA. - Environmental assessment alone isn't protecting environment, there is need of full dedication, understanding and commitment of proponent regarding importance of protecting environmental quality.
3.	05-03-2025	LWMC, Shaheen Complex, Egerton Rd., Lahore	Mr. Adeel Pervaiz [Sr. Manager Landfill]	- It's a good initiative for economic empowerment of the area. This project will augment job opportunities and security of area. - One of the most critical steps in the planning process of any such projects is gaining proponent's commitment to protect environment. To develop this understanding, explain the strengths and limitations of current approach and how those limitations can affect the environmental performances of such projects.
Public Consultation				
1.	06-03-2025	Main Bazar Gujrat-Hafizabad Road	Mr. Qari Asif [Imaam Masjid]	- Establishing an LPG storage and filling plant on Main Road, Hafizabad would provide a reliable energy source for the region, reduce fuel shortages, and support local businesses. Proper safety measures must be in place to prevent any risks associated with LPG storage and handling.
2.	04-03-2025	Post Office	Mr. Tufail Khan [Businessman]	- There is no project like that in 60km. We face a lot of difficulty during finding a job.

3.	06-03-2025	Private Pharmacy main bazar	Mr. Zohaib Abbasi [Shop Owner]	- Here is need of LPG Storage like projects in main Road, It must be there.
4.	05-03-2025	P/O Hafizabad	Mr. Zahor Mehmood Abbasi [Business man]	- There is need for job opportunity. So, it is very necessary.
5.	03-03-2025	Main Bazar	Mr. Shair Afzal [Shop Owner]	- People face difficulty finding a job. Hence, we request to establish the plant.
6.	04-03-2025	Just Pure Milk Shop	Mr. Ghaur Pervaiz [Self Employed]	- It is an urgent need not only for the local people but it will serve the requirements of fuel for all people.
7.	03-03-2025	Main Bazar	Nazim Afraz [Driver]	- There is no plant within area and we are very worry. It's our request to establish one plant here.
8.	05-03-2025	Main Bazar	Mr. Naseer Ahmed [Driver]	- We people are very worry. People selling LPG in black and we are compelled to buy.
9.	06-03-2025	Main Bazar	Mr. Attaullah Abbasi	- Very very necessary.
10.	05-03-2025	Main Bazar	Mr. Shehzad Tufail [Driver]	- It is very necessary. We will get benefit. There is no Plant within 100km.
11.	03-03-2025	Main Bazar	Mr. Waqas Ahmad [Driver]	- No plant nearby.
12.	04-03-2025	Post Office	Mr. Mati-UR- Rehman [Public Relation Officer	- This is the best project for over Main Road in this Region no plant.
13.	04-03-2025	post office	Mr. Mehmood Abbasi [Catering Business]	- The area is huge. There is no other way of job.
14.	06-03-2025	Hafizabad	Mr. Awasi Ishfaq [Car Dealer]	- It is very necessary. That's why people get benefit.
15.	03-03-2025	Main Gujrat Road	Mr. Muzaffar Mehmood Abbasi [Restaurant Owner]	- No plant within 100km. Petrol of 500 rupees waste in this situation for doing their job.
16.	03-03-2025	Near Post Office	Mr. Wajid [Newspaper Seller]	- Dire need of plant here. With my idea it will beneficial for us.
17.	06-03-2025	Main bazar	Mr. Khayam Usman [Restaurant Owner]	- No plant here so dire need of local people.

18.	04-03-2025	Main bazar	Mr. Mansor Ahmed [Job]	- No Plant in this area. No plant within 100km. half tank required to go there and half to go back.
19.	05-03-2025	Main bazar	Mr. Ahsan Ali [Job]	- if plant establish there it will facilitate locals.
20.	05-03-2025	Near Post Office	Mr. Anser Anwar [Shop]	- Dire need of plant here. With my idea it will beneficial for us.
21.	06-03-2025	Main bazar	Mr. Faizan Ali [Driver]	- We need Plant here for the job opportunity.
22.	04-03-2025	Main bazar	Mr. Talib Hussain [Shopkeeper]	- Residence of local face difficulty because of no JOB distance.
23.	06-03-2025	Village Near Hafizabad	Mr. Sohail Ahmed [Driver]	- This Plant is much needed.
24.	04-03-2025	Main bazar	Mr. Mohsin Abbasi [Bike repairing]	- It is request to establish Plant. We need Plant here.
25.	05-03-2025	Main bazar	Ms. Naseem Abbasi [Driver]	- If plant establish there it will facilitate locals.

CHAPTER-6

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

6.1 GENERAL

The potential environmental impacts have been studied related to design, location, construction and operational stages of the proposed project. Environmental protection measures are recommended to eliminate adverse environmental impacts or to reduce them to an acceptable level within the prevailing legislative and regulatory framework.

6.2 IMPACT ANALYSIS

Potential Environmental impacts associated with proposed study has been analyzed by a process wherein a group of experienced people with relevant experience were involved for identifying potential safety and operational problems associated with the design, maintenance or operation of a proposed project. They assessed different parts/ components of proposed project in critical view to environmental protection. Proposed project has been evaluated laterally and collectively about what impacts might be expected to arise with the proposed project. Impacts are evaluated on the basis of magnitude, immediacy and sustainability. Evaluation criteria are as follows:

- Magnitude
  - Type of impact (direct, indirect, cumulative)
- Immediacy
  - Temporal extent (during construction, after construction)
  - Spatial extent (local, widespread)
- Sustainability and Reversibility
  - Mitigability (fully, partially)
  - Monitoring (fully, partially)

Furthermore, ***consultative meetings*** were held for impact analysis with EIA team members and proponent of the project. Risk rating factors were the main agenda of these meetings for each environmental inventory element. Final outputs are presented in following sections below.

6.3 METHODOLOGY FOR IMPACT IDENTIFICATION

Screening of the potential impacts associated with the proposed project activities was carried out with help of Checklist and Leopold Matrix methods specifically tailored for this project.

6.3.1 Checklist

This lists significant environmental effects known to have occurred in past relevant development projects. This is arranged to permit (i) ready screening out of non-pertinent items by checking the column 'No significant effects' and (ii) ready grading of significant environmental effects by degree of effect. The checklist presented as Table 6.1 shows checklist of environmental parameters & its consequences for Installation of LPG Storage and Filling Plant by Haroon Energy (Private) Limited.

6.3.2 Leopold Matrix

With the help of this matrix, interaction of various project activities with various components/aspects of the environment was identified. This interaction was then categorized with respect to its severity of impacts, as follows:

- Low Adverse: LA
- Medium Adverse: MA
- High Adverse: HA
- Low Beneficial: LB
- Medium Beneficial: MB
- High Beneficial HB

With the help of the above ranking, less important/ severe impacts were screened out from the ones which were more important, needing further discussion as presented in table 6.2.

6.4 IMPACT CHARACTERIZATION

Subsequent to the impact screening, various characteristics of the potential impacts including spatial extent (local, regional, global), nature (direct/indirect), temporal extent (temporary, permanent), reversibility, severity, sensitivity of receptors and significance of impacts were determined.

Impacts characterization associated to project activities/ operational phase and their explanation is presented in table 6.3.

Table 6.1: Checklist for Environmental Consequences

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
1) Earth Resources							
1.1	Excavation and leveling	✓				Minor	Excavation of insignificant level will be carried out for the basement of proposed retail outlet.
Geological hazards							
1.2	Faults		✓				The building structure will be designed to withstand the seismic action (load) without local or general collapse.
	Landslides			✓			
	Un-engineered fill			✓			
	Earthquake consideration	✓				Minor	The proposed structure will be designed to withstand seismic loads in accordance with the Uniform Building Code – 1997, Building Code of Pakistan Seismic Provision – 2007 to ensure the safety of the building during such an event. The significance of this impact is minor as the proposed building will be constructed as per the applicable building code for Hafizabad and adjoining areas
1.3	Contaminated soils		✓				Possibility of soil contamination due to oil spills from generators, vehicle workshops, and accidental spills. The chances of soil contamination are close to negligible.
1.4	Contaminated surface or groundwater		✓				The chances of groundwater contamination are close to negligible as the proposed site is an area where no major activity generating excessive effluent exists.
1.5	Borrow pits		✓				Borrow pits (if any), will be restored after completion of the construction activities.
1.6	Loss of high-quality farmlands			✓			
1.7	Site drainage	✓				Minor	A surface drainage system will be designed to cater the needs of the project site.
2) Air Quality							
Substantial increase in onsite air pollutant emission-construction phase							
2.1	Dust emissions during construction activities	✓				Moderate	Dust emissions during construction will be mitigated by applying measures as per EMP.
	Emissions from vehicles and machinery		✓			Minor	Emissions from vehicles and machinery used during the construction

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
							phase will be mitigated by adoption of measures as presented in EMP.
	Substantial increase in odor during construction		✓				Paint, polishing, pesticide spray would produce odor. Safe Use Action Plan will be implemented and further impacts will be mitigated by using proper mitigation measures as per EMP.
Substantial increase in onsite air pollutant emission-operation phase							
2.2	Emissions from generators		✓				Proposed project activity would involve use of generator of 50 kVA capacity during load-shedding hours. Therefore, proper mitigation measures for use of generator would be adopted as per EMP to avoid deterioration of air quality.
	Increase in odor		✓				Proper ventilation within the building will be ensured.
	Violation of applicable air pollutant emissions or ambient concentration standards	✓					To limit air emissions from proposed facility, it must be properly operated and carefully maintained.
	Consideration of indoor air quality	✓					Indoor environmental quality will have an impact in terms of the health and productivity of the building user. Poorly designed buildings will lead to increased operating costs and waste of resources. Indoor air quality will be improved by keeping in view the proper ventilation of the building.
3) Water Resources and Quality							
3.1	River, stream or lake onsite or around the project site			✓			
3.2	Provision of safe drinking water during operational phase				✓		Water needs will be fulfilled by groundwater which is found safe for drinking after monitoring results appended as **Annexure.**
3.3	Presence of any wetland of national importance (like game reserve, wildlife sanctuary etc.) or international significance (like Ramsar site etc.) located within or around the proposed project site			✓			
3.4	Discharges to surface or groundwater			✓			
3.5	Onsite bulk storage of liquid fuels or hazardous materials.		✓				Chemicals and paints, pesticides, fuel etc. may be stored on padded floor with impermeable lining or as per regulated SOPs.

3.6	Site Drainage.			✓			The sewerage from the proposed facility will be disposed off after due treatment in proposed 3 stage septic tanks. Small diameter sewer line collecting the sewage flow from the proposed center will be combined with the external nearby sewer drain at an appropriate point keeping in view the diameter and invert level etc.
4) Cultural resources							
4.1	Pre-hisotric, historic or paleontological resources within or around the proposed construction site.			✓			
4.2	Any gazetted or notified archaeological site located within or around the project site			✓			
4.3	Any cultural, religious site located around the project site.			✓			
4.4	Site/ facility with unique cultural or ethnic values.			✓			
5) Biological resources							
5.1	Vegetation removal			✓			Proposed project does not involve any vegetation removal/ tree cutting.
5.2	Construction in wetlands or riparian areas			✓			
5.3	Use of pesticide/ rodenticide/ insecticide	✓				Minor	Anti-termite treatment will be used according to Regulation 22 CFR 216.3 (b) (a through l). Only registered pesticide from USEPA will be used. Proper safety measures including use of Personal Protective Equipment (PPE) will be ensured. Selection, storage and application of pesticide will be recommended as per 2011 Pakistan Programmatic Umbrella PERSUAP.
5.4	Protected areas (wildlife sanctuary, national park) or within game reserve declared by provincial wildlife Ordinances/ Laws			✓			
5.5	Any rare, threatened or vulnerable wildlife or vegetation specie observed/reported in or near project site			✓			

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
5.6	Presence of core habitat for any key wildlife species, within or in close vicinity of project site (e.g., path of migratory birds)			✓			
6) Planning and Land Use							
6.1	Potential conflict with adjacent land uses			✓			
6.2	Non-compliance with existing codes, plans, permits or design criteria			✓			
6.3	Potential impact on adjacent buildings due to construction of existing structures			✓			
6.4	Construction in public park or designated recreational areas			✓			
6.5	Create substantially annoying source of light or glare			✓			
6.6	Relocation of > 10 individuals for +6 months			✓			
6.7	Interrupt necessary utility or municipal services for more than 10 individuals for +6 months			✓			
6.8	Substantial loss/ inefficient use of mineral or nonrenewable resources			✓			
6.9	Increase in existing noise levels	✓					Noise will be generated during construction/ operational activities. To minimize the noise impact proper mitigation measures will be adopted as per EMP.
6.10	Non-compliance with building codes (Structure failure)			✓			
7) Traffic, Transportation and Circulation							
7.1	Increase vehicle load or congestion on existing roads		✓				Main Lower Topa - Kohala Road can bear load upto double excel truck however; restoration of any damage to road shall be paid by project proponent.
7.2	Onsite congestion due to fuel transporting vehicles.		✓				Allocation of proper place for vehicles will be carried out to avoid congestion and haphazard movement of vehicles onsite.
8) Hazards, Workers Safety							

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
8.1	Substantially increase risk of fire, explosion, or hazardous chemical/ fuel/ LPG leakages		✓				Any potential increase in risk of fire, explosion, or hazardous chemical/ fuel/ LPG release will be minimized onsite for handling any emergency situations as mentioned in EMP.
8.2	Accidents or human health hazard		✓				Risks of accidents and human health hazards will be avoided by putting caution signs and use of PPE during work hours as mentioned in EMP.
8.3	Worker's safety	✓				Minor	Safety procedures will be ensured during electrical installations and operational activities.
9) Hazardous waste							
9.1	Increase quantity of heavy metals			✓			
9.2	Bulk quantities of hazardous materials or fuel storage			✓			
9.3	Increase in hazardous waste		✓			Minor	All hazardous waste needs to be disposed properly via suitable disposal option.
10) Non-Hazardous waste							
10.1	Construction waste/ Municipal waste	✓				Minor	Impacts from construction/ municipal waste will be mitigated according to measures mentioned in EMP.
10.2	solid waste management	✓				Minor	Solid waste will be managed as per EMP.
11) Electrical and Mechanical Installations and Fixtures							
11.1	Presence of Halons, HCFC's in HVAC systems, refrigeration equipment and fire suppression equipment.			✓			
11.2	Presence of PCBs in electrical equipment.		✓				Electrical equipment's free from PCBs must be installed.
11.3	Safety issues for using low quality cables and appliances.		✓				Chances of short circuiting and fire hazard are more in low quality cables so high-quality cables and appliances will be used.
12) Paints							
12.1	Presence of Lead and arsenic or any other banned chemical in the paints.		✓				Some paints may contain toxic substances such as arsenic[3]. Such paints will not be allowed to use.
13) Spills/ Leakages							
13.1	Leakages from generators & boiler		✓				Regular monitoring is required to prevent any leakages.

[3] TECHNICAL BULLETIN HEALTH EFFECTS INFORMATION; Oregon Department of Human Services, http://public.health.oregon.gov/HealthyEnvironments/DrinkingWater/Monitoring/Documents/health/arsenic.pdf

Sr. No.	Activity / Parameter	Y*	M*	N*	B*	Impact**	Explanation of Environmental Consequences (Y, M, B)
13.2	Leakages from vehicles and fuel storage tanks		✓				All spills/ leakages will be mitigated according to EMP.
13.3	LPG leakages		✓				Project management will apply strict rules on his workers and labor to ensure that no spill or leakages are caused. If spills/ leakages occur, it should be managed as per measures suggested in EMP.
14)	**Result**						
14.1	Substantial adverse impact			✓			
14.2	Adverse impact			✓			
14.3	Minimal impact	✓					Overall, the project will have minimal impact.

Notes:
Y*: Yes, M*: May be, N*: No, B*: Beneficial
** Impacts: Minor, Moderate, Major

Table 6.2: Leopold Matrix – Impacts for Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited.

Environmental Component / Project Component		PHYSICAL ENVIRONMENT													BIOLOGICAL ENVIRONMENT										SOICAL ENVIRONMENT									
		Soils (Erosion/Stability)	Agricultural land	Energy/Mineral Resources	Water logging	Salinity	Climate	Geology	Seismicity	Drainage Aspect	Surface Water	Groundwater	Air Quality	Noise	Aquatic Ecosystem	Wetland Ecosystem	Trees	Endangered Species (Plants & animals)	Migratory Species	Crops	Birds and Animals	Plants	Wildlife	Disease Vectors	Public/ Workers Health	Land Use	Flow of Road Traffic	Employment	Structures and Infrastructure	Temporary Displacement of People	Permanent Displacement of People	Cultural & Religious Values	Tourism & Recreation	Disruption of Businesses
Design	Earthquake consideration	MB							MB																HB	MB			HB					
	Landscaping	MB											HB				HB				MB	MB			MB	MB								
	Site drainage	MB								MB	MB														MB				MB					
	Work force																											MB						
	Green Building measures			HB								HB	HB				HB								HB	HB			HB					
Construction	Excavation	MA		LA								LA	MA	MA							LA	LA			LA	LA								
	Construction (activities, materials, equipment's)	LA		MA								MA	MA	MA							LA	LA			LA	LA	LA	MB						
	Construction Waste											MA	LA												LA	LA	LA							
Operation	LPG Storage Tanks & Fueling area											LA	LA	LA											HB	HB		HB						
	Fueling/ Defueling											LA	LA																					
	Working of generator			LA									LA	LA			LA								MA			LB						
	Utility Services																								HB									

Table 6.3: Impact Characterization

Environmental Impacts → / Categories ↓	Health & Safety Hazard	Soil Contamination	Water Quality	Air Quality	Explanation
Nature	Direct	Direct	Direct	Direct	**Direct:** The environmental parameters are directly affected by the Project construction or operation. **Indirect:** The environmental parameter changes as a result of alteration in another parameter.
Duration of Impact	Long term	Short term	Short term	Short term	**Short-term:** The impacts that last only during the construction of the proposed Project e.g., noise from the construction activities. **Medium-term:** lasting for a period of few months to a year the project before naturally reverting to the original condition such as loss of vegetation due to clearing of campsite, contamination of soil or water by fuels or oil. **Long term:** lasting for period much greater than medium term impact before naturally reverting to the original condition such as loss of soil due to erosion.
Geographical Extent	Local	Local	Local	Local	The geographical extent may be local or regional (spatial dimension)
Project Phases	On going	On going	On going	On going	Pre-construction (designing), Construction and Operational. Impacts are ongoing only during operational phase
Reversibility of impacts	Temporary	Temporary	Temporary	Temporary	**Temporary:** The impacts that don't cross ecosystem threshold value of resilience. **Permanent:** The impacts that exceed ecosystem threshold value of resilience i.e., community that cannot come back to its original stage without external aid.
Likelihood of the Impact	Certain	Likely	Likely	Likely	**Certain:** Impact anticipated occurring under extreme circumstances. **Likely:** Impact will probably occur under less extreme circumstances. **Possibly:** Impact may possibly occur during different stages of the project. **Unlikely:** Impact could occur during many stages of the project. **Rare:** Impact may occur but only under exceptional circumstances.
Impact Consequence Severity	Major	Minor	Minor	Minor	**Major:** When an activity causes irreversible damage to a unique environmental feature; causes a decline in abundance or change in distribution over more than one generation of an entire population of species of flora or fauna; has long-term effects (period of years) on socio-economic activities of significance or regional level. **Moderate:** When an activity causes long-term (period of years), reversible damage to a unique environmental feature; causes reversible damage or change in abundance or distribution over one generation

					of a population of flora or fauna; has short-term effects (period of months) on socio-economic activities of significance on regional level. **Minor:** When an activity causes short-term (period of few months) reversible damage to an environmental feature; slight reversible damage to a few species of flora or fauna within a population over a short period; has short term (period of months) effects on socio-economic activities of local significance. **Negligible:** When no measurable damage to physical, socio-economic, or biological environment above the existing level of public concern; and conformance with legislative of statutory requirements.
Significance of Impact	Medium	Low	Low	Low	Impact may be categorized as high, medium, or low. Based on the consequence, likelihood, reversibility, geographical extent, duration, level of public concern; and conformance with legislative of statutory requirements.

6.5 IMPACT SIGNIFICANCE

Subsequent to screening and characterization, impacts of significant importance are described below:

- Health hazard for staff, workers, and nearby communities caused by not following PPEs, as well as improper construction/ operational SOPs;
- Safety hazards caused by various stages of improper practices and fuel handling;
- Hazardous waste generation & its disposal;
- Mechanically created or externally added pollution during execution phase of proposed project;
- Air quality deterioration caused by fumes from LPG store area/ tanks; and
- Soil contamination caused by LPG/ leakages and (improper) disposal.

Based on the above screening and evaluation process the following determination (check all that apply) is recommended. It is assessed that proposed project has minimal adverse impacts after proper implementation of mitigation measures proposed for each associated activity.

	The activity contains. . .	**(Equivalent regulation)**
☐	Very low risk sub-activities	categorical exclusion(s)
☐	After environmental review, sub-activities determined to have **no significant adverse impacts**	negative determination(s)
☑	After environmental review, sub-activities determined to have **no significant adverse impacts, given appropriate mitigation and monitoring.**	negative determination(s) with conditions
☐	After environmental review, sub-activities determined to have **significant adverse impacts**	positive determination(s)

6.6 Mitigation & Impact Assessment

Anticipated Environmental Impacts on proposed project of Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited upon consequent, relevant mitigatory measures have been suggested and presented in table 6.4 below.

Table 6.4: Mitigation and Impact Assessment

Sr. #	PROJECT ACTIVITY	DESCRIPTION*			MITIGATION MEASURES**
		When	*Where*	*How*	
i. Earth Resources					
1.1.	Excavation & leveling	»Construction phase	»Proposed Project site	»Excavation will be carried out for the basement of proposed building.	»Excavated soil should be stockpiled at appropriate locations. Adequate enclosures to be provided for such storage, to avoid blowing away by wind and run off with storm water. »Use of security fences or hazard tapes to warn and control the access of unauthorized persons to the excavated site. »Weekly monitoring during excavation & reporting by HSE manager of construction contractor.
1.2.	Earthquake consideration	»Planning/ designing phase	»On site	»The building structure will be designed to withstand the seismic action (load) without local or general collapse. »Significance of Impact is minor	»The design specification will be followed to withstand seismic loads in accordance with the Uniform Building Code (UBC) - 1997 and Building Code of Pakistan (BCP), Seismic Provisions - 2007, as required by local codes and standards for high degree of structural competence, reliability and ease of construction[4]. »It will be executed and managed at planning & design phase by design contractor.
1.3.	Soil contamination	»Construction & Operational Phase	»On site	»Improper handling of construction material by construction workers; »Inadequate handling & disposal of contaminated soil.	»Impart proper training to their workforce in the storage and handling of obnoxious materials that can potentially cause soil contamination by construction contractor. It must be monitored and implemented by HSE manager of construction contractor. »Implement mitigation measures suggested under sub-section 6.9.2 & 6.10.3.
1.4.	Loss of trees/ vegetation	»Construction Phase	»Project site	»No tree cutting is involved in stated project.	»It will be executed by project proponent.
1.5.	Land Use	»Planning, Construction	»On site	»Potential impact on adjacent buildings due to	»The construction contractor must ensure that all structure, equipment, materials and facilities used or created on site

[4] Structural designs at present in Pakistan is designed as per UBC-97 and ACI 318-02M because of the local techniques, procedures, technologies and material available for concrete and other construction material. The building Codes BCP, SP-2007, Design of Concrete Structures by Arthur H. Nilsson, Design of Reinforced Concrete by M. C. Cormac, Foundation Analysis and Design by J.E. Bowles will also be followed in due course of time upon availability of advanced materials and techniques in Pakistan

			& Operational Phase		construction of proposed facility; it is anticipated to be minor; »Aesthetic value of the area might get impaired.	for/ or during construction activities are removed. »Tree plantation must be encouraged in and around project site for enhanced aesthetics of the area.
i. Air Quality						
2.1.	Dust Emissions		»Construction phase	»On site	»Due to construction activities, dust will be generated.	»Sprinkling of water to suppress dust emissions. »Periodic Environmental monitoring to be carried out by HSE manager of construction contractor.
2.2.	Emissions from vehicles/ generator stack/ chemical fumes from fuel storage tanks		»Designing, Construction & Operational Phase	»On & Off site	»Vehicles washing, servicing and repairing works onsite »Flue gas emissions from generator & fuel storage tanks if not maintained properly	»Use of properly maintained and tuned vehicles/ equipment/ generators onsite to avoid air and soil pollution. »Properly designed and maintained ventilation as it is one of the more effective ways of reducing exposure to harmful chemicals in the form of fumes. »Implement mitigation measures suggested under sub-section 6.9.5 & 6.10.5. »Periodic Environmental monitoring in specific to air quality will be carried out by HSE manager of construction contractor. »Besides, it will be taken care to operate processes and activities to minimize emission hazardous to health of proposed project by Design Contractor & Project Proponent.
2.3.	Increase in odor		»During operational phase	»On site	»Odor from LPG storage tanks/ fueling or defueling area.	»Proposed facility must be properly ventilated & designed. »It will be executed by construction contractor and ensure compliance to use of PPEs by workers while handling LPG. »HSE manager will monitor use of PPEs by workers on daily basis.
i. Water Quality						
3.1.	Surface/ Ground water Contamination		»Construction & Operational Phase	»On & off site	»Improper sanitation system for construction as well as operational workers.	»Proper sanitary system must be providing to construction workers on temporary bases during construction phase. »The chances of water contamination are close to negligible as no major activity generating excessive effluent exists. »It will be executed by construction contractor during construction phase & project management during operational phase.

					»Implement mitigation measures suggested under sub-sections 6.9.4 & 6.10.4.
.	***Traffic, Transportation, Circulation***				
4.1.	Congestion on existing road	»Construction & Operational Phase	»On site	»Traffic jams or congestion on road by the movement of construction/ raw material/ petrol transporting vehicles during the peak traffic hours.	»Traffic jams or congestion on road will be eliminated by avoiding the movement of vehicles during the peak traffic hours »Allocation of proper place for vehicles will be carried out to avoid congestion and haphazard movement of vehicles onsite. »Daily monitoring by HSE manager of construction contractor to ensure pedestrian/ operator's safety and their ability to complete the task without incident.
.	***Solid Waste***				
5.1.	Municipal waste	»Construction & Operational Phase	»On Site	»Garbage produced by workers; »Hideous littering by workers engaged for operational activities.	»Measures should be adopted for safe and environment friendly disposal of all generated solid and liquid wastes. It is recommended that workers must restrict their activities within the project premises. »Orientation trainings will be provided to the workers for identification, segregation & management of solid waste during construction & operational phase. »Weekly monitoring and inspection of waste management related facilities and activities in order to ensure compliance as per applicable rules & regulations by project management. »Maintain records of training.
5.2.	Hazardous waste	»Operational Phase	»On site	»Regular and thorough management of hazardous waste which is absolutely essential for efficient operation.	»Monthly monitoring & inspection of haz. waste management activities directly resulting from executing the project process by project management during operational phase. »Implement mitigation measures suggested under sub-section 6.10.9.
i.	***Health & Safety***				
6.1.	Accidents/ human health hazards	»Construction Phase	»On site	»Construction activities will pose certain negative impacts on workers.	»Ensure safe working practices are observed at all times while carrying out work activities by construction contractor. »All accidents, whether to themselves, others or property must immediately be reported to project management. »Site specific HSE Plan must be used as a guide to assist the

						Contractor working on this project. »HSE manager by Construction Contractor will be responsible for periodic site safety inspections. »Implement mitigation measures suggested under sub-section 6.9.10.
6.2.	Workers' health & safety		»Operational Phase	»On site & On duty	»All workers entitled to work in environments where risks to their health and safety may arise due to certain reasons/ negligence.	»Contractor as well as project management must be committed to ensuring that all workers remain aware of their responsibility for the safety of themselves and their fellow workers. »Implement mitigation measures suggested under sub-section 6.10.10.
6.3.	Noise/ Vibrations		»Construction & Operational Phase	»On site & On duty	»Construction activities such excavation, use of heavy machinery etc. may generate noise; »Use of unnecessary horns by drivers of construction/ fuel transporting vehicles; »Noise will also arise from generators operational during load-shedding hours.	»Drivers must be aware of their code of conduct and avoid use of unnecessary horns. »Implement mitigation measures suggested under sub-sections 6.9.6. & 6.10.6. »Minimum number of vehicles must be used for construction material and LPG transportation to mitigate noise and exhaust emissions. »Daily monitoring by HSE manager of construction contractor to check compliance as per PEQS during construction phase. »Noise from generators must be curtailed within limiting values set by PEQS via engineering control.
6.4.	Emergency Response		»Design, & Operational Phase	»On site & On duty	»There are always chances of fire risks/ another hazard of worth considering (explosion, petrol spills, earthquakes etc.)	»Operating procedures must be in place to minimize the fire danger at the site. » It must be executed and monitored by project proponent in close liaison with design contractor of stated facility.
i.	***Others***					
7.1.	Electrical and mechanical installations/ fixtures		»Installation phase during finishing	»On site	»Use of low-quality cables as chances of short circuiting and fire hazard are more in low quality cables.	»Procurement and installation of cables/ equipment/ technologies that would have minimum impact on the environment and human health must be ensured by project proponent. »It must be monitored during installation by HSE Manger and executed by procurement contractor in close liaison with

					project proponent.
7.2.	Spills/ leakages	»Construction Phase	»Project area	»Spills/ leakage may result due to improper handling of paints, fuels, solvents, cements, chemicals etc.	»Ensure proper handling and storage of chemicals/ paints/ fuels etc. and should be marked to highlight their content. »Workers must be aware of their code of work. »Compliance to above stated as well as to use of PPEs by workers must be monitored by HSE manager of Construction Contractor during construction phase and project management during operational phase.
7.3.	Use of pesticides/ insecticides	»Operational Phase	»Project area	»Use of mosquito repellent sprays/ fumigation to disinfect and control pest/ disease vectors.	»Mosquito repellent sprays/ fumigation should be carried out as per project safety plan. All safety measures including use of PPE must be ensured. »HSE manager will monitor compliance to use of PPEs during pesticide spray.

** It contains when problem will occur and when, where & how it will be occur.*
*** It suggests whys of achieving mitigation measures [changing in planning and design/ improved monitoring and management practices/ compensation in money terms/ replacement, relocation & rehabilitation*

Moreover, assessed impacts and their mitigation measures are discussed in detail at each stage of proposed project activities as described below.

6.7 IMPACTS DUE TO PROJECT LOCATION

The project envisages Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited at Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad. The possible environmental impacts due to project location are described below.

6.7.1 Land Acquisition & Change in Land Use Pattern

The land required for the proposed project is in the possession and own by project proponent. This reason best supports the presence of this project at this site. At current situation, most of the land in area is agricultural. This trend may result in the depletion of agricultural land.

Mitigation

There is no any tree cutting during construction phase however, if any then Ensure the plantation of those plants which will be removed during construction so that the impact should be compensated.

6.7.2 Environmental Sensitive Areas

The project area is not falling any environmental sensitive area, however proper precautionary measures will be taken during installation and operational phase of this project.

Mitigation

EMP is attached which contains all necessary measures to ensure no harm to environment during all phases of project.

6.7.3 Historical, Archeological or Cultural Sites

There are no cultural resources, historical place or archeological sites such as ancient monuments, forts, sculpture, etc. to be destructed.

Mitigation

Not required.

6.7.4 Existing Infrastructure

Infrastructure like roads, electricity, telephone, natural gas and drainage system is already present in the area. As existing planning and design standards are suited to local conditions, hence, there will not be any unnecessarily wasteful of land.

Mitigation

Not required.

6.8 DESIGN RELATED IMPACTS

The construction plan of proposed project is taking consideration of all engineering details, their soundness and else as desired under all applicable national rules & regulations for such assemblies. This will automatically take care of the soundness of the structure and its design. The present EIA Report testifies that there will not be any environmental problems at all, due to project design.

In view of these considerations no environmental problems are foreseen in the context of design. However, the possible impacts of proposed project have been considered and their mitigation measures proposed as under:

6.8.1 Drainage Pattern

Partial drainage system is available around the project site for waste water disposal. The project site is located on the main Main Road and there is open drain present nearby project site. All the waste water (constituting sewage only) from the proposed facility will be disposed into this drain after due treatment in 3 stage septic tanks.

Mitigation

As there is no significant impact on drainage pattern, so, no mitigation is required.

6.8.2 Seismic Hazard

The proposed project is situated in moderate damage zone. In this zone distant earthquakes with fundamental periods greater than 1.0 second may cause damage to structures.

Mitigation

The structure of the proposed project has been designed in such a way that the building may withstand moderate to large earthquakes.

6.8.3 Water Resources

Ground water will be extracted via installation of electric pumps. Major use of this ground water is for allied activities such as washroom/ official activities by workers.

Mitigation

- Ensure that projected use of ground water is within the capacity of natural system to replenish itself.
- Use indigenous vegetation that requires less water, drip irrigation or shaded plantings.
- Workers should strictly be advised not to misuse or waste ground water in any way.

6.8.4 Traffic Patterns

The main entrance to the project site is from the Main Road. This road passing by the project site has high carrying capacity and there will be no need to construct a separate road for this project. The existing road will be utilized for all the traffic movement involved in this project.

Mitigation

Not required.

6.8.5 Emergency response

There are always chances of earthquakes and other manmade disasters such as fires due to electrical short-circuiting, over heating etc. Besides, proposed building layout has been designed with inception of such considerations.

Mitigation

The following mitigation measures will be adopted to minimize or eliminate the emergency situations:

» The design of proposed project will also include emergency exits and open space for gathering which can be used during emergency situation.

» Adequate water distribution system will be designed, which could also supply adequate quantity of water for fire-fighting during emergency.

» Fire hydrants and firefighting extinguishers will be provided at locations where necessary.

6.9 IMPACTS DURING CONSTRUCTION STAGE

The potential environmental impacts of the proposed project along with the mitigation measures during the construction stage have been described as following:

6.9.1 Impacts on Topography

Civil work will be done for the construction of proposed facility so there will not any major changes in the existing topography of the project site. The changes due to the civil work will be of localized nature. There will be no significant changes off-site the project area.

Mitigation

Not required.

6.9.2 Impacts on Soils

The overall geology and soil quality of the project site is not expected to be adversely impacted due to the execution of the proposed project during the construction period. Any improper storage or handling of hazardous or flammable materials including

paints, fuels, solvents, oil, cement etc. would result in soil contamination.

The contamination of soil can take place at concrete mixing areas if the activities are carried out in unmanaged way.

Mitigation

» The contractor will be required to impart proper training to their workforce in the storage and handling of obnoxious materials, like furnace oil, diesel,

and chemicals etc. that can potentially cause soil contamination.

» Soil contamination by asphalt and other obnoxious material will be minimized by placing all containers in caissons or dumped into pits lined with impervious liners to avoid contamination of soils/ groundwater from leachates.

» Proper drainage facility should be provided at campsite areas to avoid the water accumulation which will minimize the soil contamination.

» Solid waste generated during construction should be properly treated and safely disposed of only at demarcated waste disposal sites.

» Plantation needs to take place at the project site so that soil becomes stabilized.

6.9.3 Impacts on Groundwater

The ground water is well protected by existing geological conditions in the site area. No appreciable impacts on the ground water quality are expected. The ground water used for the project activity will be taken by already installed water turbine. So there will be no additional pressure on the ground water table.

Mitigation

Not required.

6.9.4 Impacts on Surface Water

Excessive runoff, especially in rainy days, due to different activities to be carried out during construction phase can result in the increase of Total Dissolved Solids **(TDS)** and Total Suspended Solids **(TSS)** in small water channels. Similarly, untreated sewage can result in high value of Chemical Oxygen Demand **(COD)** and Biochemical Oxygen Demand **(BOD)** of surface water.

Mitigation

» The workers will be provided with washrooms and toilets at site.

» Proper sanitary system will be developed on temporary bases.

» Wastewater effluent from construction equipment, washing-yards should be passed through the primary treatment process to remove macro contaminants before discharging it into natural streams.

6.9.5 Impacts on Air Quality

Due to the construction activities like excavation, clearing, leveling, compaction, material transportation, earthing/ grounding etc. dust will be generated which will ultimately increase the Particulate Matter (PM) value in the area. Gaseous emissions from the heavy machinery and vehicles will also come out and this will affect the quality of ambient air. This may also pose health risk to the construction workers and residents who suffer from respiratory ailments.

Mitigation

» Periodic environmental monitoring and testing of emissions from vehicles should be carried out in order to keep the concentration of various pollutants including CO, Noise & Smoke within the PEQS limiting value.

» Ambient gaseous monitoring for various pollutants like CO, NO_2, SO_2, PM_{10} etc. should also be carried out periodically.

» Periodic maintenance of the machinery will be carried out to reduce the concentration of emissions.

» Haul-trucks carrying earth, sand, aggregate etc. will be kept covered with tarpaulin to help contain construction materials and being transported within the body of each carrier between the sites.

» Tyers of the vehicles and heavy machinery will be washed and the waste water produced as a result of this activity will be reused after due treatment. This will reduce concentration of PM in the ambient air.

6.9.6 Noise

Project activities like compaction, use of heavy machinery during the clearing of the site and trolleys and trucks used for the transportation of materials will create some noise and vibration. The noise may affect the workers and residents of the surrounding communities of the project site.

Mitigation

» Engines of vehicles visiting the project site should be properly tuned-up.

» Use of heavy machinery should be restricted to daylight hours in order to minimize noise pollution and vibration arising from the construction site.

» To bring down noise levels within the PEQS limiting values, noise control measures should be taken such as provision of silencers on the heavy construction vehicles and sound insulation materials should be used as barriers.

» Wide zone of green plants will also help decrease sound levels.

» As the proposed project is going to be constructed in the area far away from

residential communities. This will further reduce the exposure of noise to the surrounding communities.

6.9.7 Water Consumption

During the construction of project approximate quantity of water will be used and it will not exert any significant effect on water table.

Mitigation

Not required.

6.9.8 Waste Generation

Garbage will also be produced by workers which, if will not be properly disposed of, will cause unsanitary and unhygienic conditions on and around the project site. Resulting impacts could vary from unsightly littering of the site, fly and vermin infestations.

Mitigation

» Providing adequate waste baskets and dumpsters is essential to keep the site clean and pest free.

» Arrangements should be made for regular garbage collection from the proposed project site.

» All the putrescible material will be segregated from other waste and will be disposed of accordingly.

6.9.9 Construction Debris

Each phase of the development will produce solid waste, the disposal of which, if not managed properly could have negative impacts on the site and surrounding area.

Mitigation

» A site waste management plan should be made the responsibility of the project contractor to provide for the designation of appropriate waste storage area on the site and a schedule for the timely collection and removal of construction debris to an approved dump site.

» Only small quality of the waste will be produced as no major excavation is involved in the project.

6.9.10 Health and Safety of Workers

The construction activities will impose certain negative impacts on health and safety of the workers; however, mitigation measures will be required to minimize/ eliminate health and safety related negative impacts of the project.

Mitigation

Implementation of the following measures will ensure health and safety of the workers during the proposed construction stage:

» The Contractor will ensure that the workers / laborers are trained in safety procedures for all relevant aspects of construction.

» Proponent of the Project will make regular checks to ensure that the contractor is following safety working procedures/ safety measures.

» Formal emergency procedures will be developed for proposed project site in case of an accident. First aid kits and other necessary equipment will be kept available at site along with the list of emergency phone numbers to be contacted in case of any accident.

6.9.11 Impacts on Flora & Fauna

There are no trees or shrubs present at the proposed project site. The establishment of the proposed project will not affect the fauna of the area.

Mitigation

Following mitigation measures will be adopted to restore the environment as much as possible.

» Impact mitigation calls for protecting and restoring as much of the original condition on the development site as possible.

» In an effort to preserve the existing biodiversity, naturally occurring plants such as those used primarily by the birds for food and shelter should be planted for their survival. This would ensure that primarily native plants are used in the landscape plan thus minimizing the use of imported species and eliminating the introduction of potentially invasive species.

» Using bird feeder may encourage the displaced avifauna to remain in or return to the general vicinity, thus maintaining the existing biodiversity.

» The project contractor should be subject to punitive penalties for removal or damage of ecologically valuable trees designated for protection or relocation (if any).

6.9.12 Transportation of Construction Materials

Transportation of heavy machinery implies heavy traffic on the roads leading to the site with possible impacts to the surrounding area (dust, spillage, emissions and noise). Use of uncovered vehicles for transportation of construction materials can lead to inadvertent dispersal of materials during heavy rains or high winds during dry periods. This could have a negative impact on the residents of the surrounding.

Mitigation

» The construction activity will go on for a short period of time and there will be no worth mentioned impacts from this activity on the project area.

» Arrangements should be made with contractors to ensure that the vehicles used for transporting materials and machinery to the site are appropriately sealed and covered to minimize dust.

» Dust producing materials such as sand or cement should be stockpiled in low enclosures and covered, away from drainage areas where they could easily be washed away during rainfall.

6.9.13 Traffic Congestion

During the construction of the project, movement of heavy trucks and machinery will have only a minor impact on the traffic of Main Road as it is a wide road specially designed for this kind of heavy traffic.

Mitigation

No mitigation measures are required as this activity will be for a short period of time and the carrying capacity of main Main Road is fair enough to accommodate this traffic for that much time period.

6.9.14 Employment Generation

During construction stage of the proposed project, about 35-57 workers / laborers will be engaged. This will be positive change.

Mitigation

Not required.

6.10 IMPACTS DURING OPERATIONAL PHASE

The potential environmental impacts of the proposed project along with the mitigation measures during the operational phase have been described as following:

6.10.1 Impacts on Climate

The operation of proposed project will not affect the climate of the area on overall.

Mitigation

Not required.

6.10.2 Change in land use

As mentioned earlier, the proposed project is about Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited, and no worth mentioning activity related to environment is involved at this phase of project, hence no significant adverse impact will happen.

Mitigation

Not required.

6.10.3 Impacts on Soils

The overall geology and soil quality is not expected to be adversely impacted due to the execution of the proposed project activities.

Mitigation

Vigorous plantation needs to take place at the open vacant spots by project proponent so that soil becomes stabilized.

6.10.4 Effluent Generation

From the proposed project no process wastewater will be produced. Approximately 10 - 15 gallons/ day of wastewater will be generated from toilets/ washrooms. This water needs to take treatment before discharging.

Mitigation

» As there is no source of chemical contamination in the process water so the waste water to be generated will have no water contamination and the waste water quality will meet the prescribed limits of PEQS-Pakistan.

» The sewerage water will be treated in three stage septic tanks.

» The treated effluents will be used for sprinkling on the unpaved area, landscaped area, plants and vegetation within/ or around project site.

» The remaining effluent of nominal quantity will be discharged into nearby drain through submerged sewerage pipes.

» While laying sewage pipes, measures will be adopted to ensure that other pipes, wires or systems already existing in the route of the sewage pipes from the building to the main sewer line are not damaged.

» Sewage lines, both on site and off site, shall be laid at reasonable distances away from drinking water supply lines so as to avoid contamination of the water supply by the leakages from the sewer.

6.10.5 Air Quality Deterioration

LPG leaks/ drips and routine venting during fueling and extraction from fuel storage tanks result in air emissions constituting CH_4 predominantly. Air pollutants from LPG operations also include certain hydrocarbons such as benzene. The air quality impacts of these emissions vary based on local conditions. However, there remains much uncertainty about the actual amount released from the storage/pump tanks. Achieving and maintaining low emissions of air pollutants is crucial to minimize adverse

health impacts. Vigorous plantation is vital part of this project; this will improve air quality as well as scenic beauty of area.

Mitigation

Project proponent is obligatory to enforce implementation of following suggested mitigation measures to reduce environmental and health impacts associated with fuel storage:

» Storage tanks or other receptacles for the storage of fuel in bulk should be tested prior being brought to use after placing in a final position with water pressure by the project proponent in the presence of an Engineer accepted as qualified for the purpose

» Frequent monitoring and identifying fugitive emissions

» Seal the leaks

» Install no-bleed/ low-bleed pneumatic devices; or vapor recovery devices

» Precaution shall be taken to prevent unauthorized persons from having access to any storage shed or installation

» Tank gauges shall be checked at frequent intervals

Besides, proposed project is only about storage/ fueling of LPG and does not involve LPG process activities/ burning. Proposed project will result in a localized negative direct impact on existing ambient air quality in the surrounding areas. The anticipated impacts will not result in notable changes to the resource/ receptor. LPG fueling/ defueling will result in possible increase of the total pollutant concentrations, in very close proximity to the storage shed; significance of this impact is negligible with implementation of suggested standard mitigations.

6.10.6 Noise and Vibration

There is no such significant impact of noise and vibration associated with operational phase of this proposed project except running of generator and that impact will be localized and for shorter time period only during power shut down.

Mitigation

» Ensure Proper maintenance of the generator.

» Provide proper acoustic enclosures, vibration insulator paddings for the noise generating generator.

» Provide Ear mufflers/ plugs for workers working in the noisy area.

» Regulate the length of noise exposures by proper shift scheduling, job rotation and/or by restricting the operation of the noise source.

6.10.7 LPG Leakage/ Spills

One potential source of environmental risk is leakage from the LPG storage containers/ tanks. Manhandling of the equipment may result in some environmental damage. To overcome such potential situations a full proof Emergency Response Plan must be in place.

LPG storage area is designed to appropriate standards and is fitted with adequate safety and monitoring control devices and shall be operated by competent persons. There is a suitable program of maintenance and have appropriate security measures to prevent deliberate interference.

Mitigation

» Regular inspection of facility for intercepting leaking and spilled LPG from storage tanks will be the order of the day.

» Any leakage from any point will be attended carefully and immediately.

» Ensure that any defective equipment or component is repaired or replaced forthwith.

» Take all reasonable precautions to prevent the escape or spillage of LPG during all operations.

» Precautions must be taken to prevent fire and explosion including appropriate protection of storage area.

» Standard Operating Procedure regarding LPG leakage shall be prepared by management. The same must be observed for stated project in order to prevent and mitigate the LPG leakage and anticipated injury or damage to the environment.

6.10.8 Water Consumption

During this phase of project, about 200-300 gallons of water will be used per day by the proposed project during its operational phase. This project quantity of water is required for allied activities such as washroom/ official activities by workers. This quantity of water will not exert any negative impact on water table because the nature of the area is agricultural cum commercial. Ample groundwater is available to meet the stated needs of proposed project.

Mitigation

Projected use of ground water must be ensured is within the capacity of natural system to replenish itself. Exploitation and waste of water should strictly be prohibited in any way.

6.10.9 Waste Generation

During the regular operation of the proposed project no process solid waste will be

produced, only kitchen waste/ Municipal Solid Waste will be produced.

Mitigation

The solid waste above is recyclable. This solid waste will be disposed off in an environment-friendly manner in line with the local municipality and through a licensed contractor who should dispose of the solid waste at the designated site by the local municipality.

6.10.10 Health and Safety of Workers

The project activities will impose certain negative impacts on health and safety of the workers engaged in fueling/ defueling process. However, mitigation measures will be required to minimize/ eliminate health and safety related negative impacts of the project.

Mitigation

Implementation of the following measures will ensure health and safety of the workers:

- Ensure that the workers/ laborers engaged for fueling/ defueling procedures are trained in safety procedures for all relevant aspects of their code of work;
- Proponent of the Project will make regular checks to ensure that the workers are following safety working procedures/ safety measures.
- Formal Environment Occupational Health and Safety Management System Manual shall be developed by Proponent and ensure its compliance.
- Workers must be provided with essential PPEs and enforce their use as order of the day.

6.10.11 Employment Generation

During the regular operational stage of the proposed project approximately 10-12 workers will be engaged. This will be a major positive impact.

Mitigation

Not required

6.10.12 Fire Risk

There is always a chance of fire at any kind of premises/ buildings. If the fire-fighting arrangements may not arrange this will be a major negative impact.

Mitigation

The following mitigation measures will be adopted during the regular operational

stage of the proposed project:

- Emergency Exits
- Smoke Detectors
- Fire Extinguishers (DCP 10 cylinders, AFFF 07 cylinders, CO2 07 cylinders, DCP 05 Trolleys)
- Emergency Signs
- Floor Marking
- First Aid Boxes (02)
- Fire-fighting Kit

6.11 POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES

Besides the concrete measures to be adopted as described above, the quality of environment will further be enhanced through the running of project in complete accordance with the 5R Principles- Reduce, Reuse, Recycle, Refurbish and Retrofit. The implementation of the project could lead to various environmental benefits, with the most significant being environmental conservation. Some of the most obvious benefits of proposed project are;

- Creation of employment opportunities preferably.
- Availability of quality LPG that will help locals saving time and lead more productive lives that are paramount for well-being of society.

Vigorous tree plantation, outside and inside the proposed project site will be another achievement of project management. Being environmental responsible entity, project management has nominated a budget for environmental improvement measures in this project.

CHAPTER-7

ENVIRONMENTAL MANAGEMENT & MONITORING PLAN

7.1 ENVIRONMENTAL MANAGEMENT

To implement the recommendations and suggestions for environmental protection included in Chapter 6, a comprehensive management plan is needed.

The objective of the Environmental Management Plan (EMP) is to address all the major environmental issues and provide framework for the implementation of the proposed mitigation measures during the proposed project activities. The proper implementation of the EMP will ensure that all the adverse environmental impacts identified in the EIA are adequately mitigated, either totally prevented or minimized to an acceptable level. The required actions to achieve those objectives will be successfully adopted by the concerned institutions or regulatory agencies. The implementation of EMP will be carefully coordinated with design and management program of the project to ensure that relevant mitigation measures are implemented at the most appropriate stage and resources are properly allocated to achieve the desired results.

The purpose of the EMP is to ensure that the activities are undertaken in a responsible non-detrimental manner with the objectives of: (i) providing a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental performance on site; (ii) guiding and controlling the implementation of findings and recommendations of the environmental assessment conducted for the subproject; (iii) detailing specific actions deemed necessary to assist in mitigating the environmental impact of the subproject; and (iv) ensuring that safety recommendations are complied with.

7.2 INSTITUTIONAL CAPACITY

7.2.1 Environmental Committee and its Responsibilities

Project Proponent will constitute an Environmental Management Committee including at least one qualified and experienced environmental scientist / engineer who will be responsible for the environmental management and supervisory affairs during the different stages of the project. This person can be hired by the management or can be on contract basis. The responsibilities of the EMC are as follows:

- To ensure implementation of all the proposed mitigation measures during different stages of the proposed project;
- To organize routine monitoring of water, air quality, noise etc.
- To develop operational guidelines and implementation schedule.
- Receiving complaints from people in the vicinity of the project and concerned institutions and assisting the local environmental authority including establishing

liaison with EPA.

- To ensure that project is being implemented in an environmentally friendly manner, causing least harm to the existing environment including flora and fauna, geology and soil, surface and ground water, air quality, existing utilities etc. as already discussed in Section 6.
- To look after the efficiency of Horticulture Committee (HC).

A team will be formed named as "Horticulture Committee" (HC) to attend the issues relating to cleanliness, up keeping, aesthetic beauty of the project site, general environment enhancement, tree plantation, vegetation's promotion, planting of flowers and ornamental trees on site.

Project proponent will be responsible for the execution of the project with coordination of the client. The proponent will be bound to follow the provisions of the contract documents especially about the environmental protection measures and apply good management techniques and methodology without damaging the existing environment. Obligation(s) of the proponent, to safeguard and mitigate adverse impacts and rehabilitate the environment will be addressed through environmental provisions in the contract document(s) as already highlighted in Chapter 6 and through adequate implementation at site.

7.3 TRAINING SCHEDULES

The management staff and labor of proposed project will be trained about the requirements of Environmental Management System, including but not limited to the environmental health and safety, efficient use of resources, emergency response, fire protection and safety / security issues etc.

In order to raise the level of professional and managerial staff, they need to upgrade their knowledge in the related areas. The project management will play a key role in this context.

Environmental awareness and appropriate knowledge of environmental protection is critical to the successful implementation of the EMP because without appropriate environmental awareness, knowledge and skills required for the implementation of the mitigation measures, it would be difficult to implement effective environmental protection measures. Domestic training program is proposed to train the staff. Training Plan has been formulated as part of EMP which is presented as Table 7.1 below:

Table 7.1: Staff Training Plan

Objective	Regular training & learning opportunities are an investment that helps employees to prosper their skills for them own and the organization's benefit.
Responsible	M/S Haroon Energy (Private) Limited
In-charge	Project Management
Trainer/ Facilitator	Internal and External Trainers
	[Sign here]

Training Schedule*:

Following training schedule will be adhered to train the workforce of Haroon Energy (Private) Limited internally and by external trainers. Tool box talk will be the regular feature of this training plan on weekly basis.

Training Topics	**Month 1-4**	**Month 4-8**	**Month 9-12**
Environmental Compliance of applicable laws			
Safe Use of Machinery			
Code of Conduct			
Health & Safety			
Emergency Drill			
First Aid			
Handling of hazardous material and use of PPE			
Environmental Safeguards			

*Please note – orientation/trainings will continue to be conducted twice a year, per the mentioned schedule.

Training will continue to be provided at 8:00 a.m. The entire training sessions will last approximately 3.5 hours, but may take as long as 4 hours, depending on the number of people in attendance.

New staff should be made aware of this training/orientation session, at the time of hire.

7.4 IMPACTS & MITIGATION MEASURES

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

7.4.1 Summary of Impact & Mitigation Measures

This section of EMP provides summary of management principles for the construction & operational phase of the project. The impacts on environment which are likely to be generated during execution of these phases are described in table 7.2.

7.4.2 Mitigation Plan for Construction & Operational Phase

The mitigation measures for project construction and operational phases are presented in table 7.3. Environmental actions, procedures and responsibilities as required within the construction & operational phase are specified. These specifications will form part of the contract documentation and therefore, the contractor will be required to comply with the specifications to the satisfaction of the project Manager and Environmental Control Officer, in terms of the construction contract. Environmental actions, procedure and responsibilities are required from proponent within the operation and maintenance phase are implemented.

7.5 Environmental Monitoring Program

It will be in the fitness of the things to operate this project under the Environmental Management Plan. Regular monitoring of all the significant environmental issues is essential to check the compliance status of EMP. The main objective of the monitoring will be;

- To verify the results of the environmental study with respects to the proposed project.
- To estimate the trends of concentrated values of the issues, which have been identified as critical and then planning the mitigating measures.
- To assess the efficiency of pollution control mechanism.
- To ensure that any additional parameters, other than those identified in the IEE report, do not turn critical after the commissioning of proposed project.

Environmental monitoring program for proposed project is described in table 7.4.

7.6 ENVIRONMENTAL BUDGET

The cost for environmental management and monitoring will be the part of contract of Contractor and Consultants respectively. However, a lump sum amount of PKR 0.4 million will be allocated by the project proponent as cost for environmental training, monitoring and tree plantation for a period of one year during construction and operation of the project. After that, monitoring program will be revised in consultation with EPA and cost will be revised accordingly.

Table 7.2: Summary of Mitigation & Impact Assessment

Activity	Environmental Impacts	Mitigation	Manifestation	Methods of Implementation
Construction Phase				
– Construction of paved containment/ bunded area; – Installation of locally fabricated stainless-steel tanks; – Pipework installation; and, – Monitoring system/ tank gauging.	– Improper storage or handling of hazardous/ flammable materials including paints, fuels, solvents, oil, cement etc.; – Dust due to construction activities like excavation, clearing, leveling, compaction etc.; – Noise due to use of heavy machinery; – Violation of applicable air pollutant emissions or ambient concentration standards; – Safety issues for workers; and, – Solid waste.	– Implementation of measures suggested in EMP of subject study; – Adequate care shall be taken during this phase to avoid any kind of damage to environment as well as worker's safety	– During construction Phase – Full mitigation definite	– Hiring of reputable contractor with sound knowledge of environment and HSE; – Substantial training of Workers before commencement of work; – Provision of proper sanitary system to workers; – Implementation of formal emergency procedures as per code of work by contractor; – Provision of all resources and PPEs consider essential to HSE; and, – Monitor the performance of contractor/ workers.
Operational Phase				
– Oil fueling/ defueling; – Storage tanks cleaning	– Emissions from routine venting during fueling/ defueling; – LPG leakages/ spills; and, – Health and safety issues.	– Perform regular inspection of facility; – Implementation of measures suggested in EMP of subject study. – Adequate care shall be taken during this phase to avoid any kind of damage to environment as well as worker's safety.	– During operational and maintenance phase – Full mitigation definite	– Follow regulatory rules for installation of LPG storage tanks; – Meet spill, overfill, and corrosion protection requirements; – Perform site check & corrective action; – Maintain record as required; – Substantial training of Workers regarding their code of work; – Provision of all resources and PPEs consider essential to HSE; – Monitor the performance of workers as well as work environment as order of the day; and – Proper housekeeping.

Table 7.3: Environmental Management Plan for LPG Storage and Filling Plant by M/S Haroon Energy (Private) Limited

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
Construction Phase					
1.	**Air Quality** – Dust resulting from construction – Use of heavy machinery can generate exhaust and dust emissions – Dispersion of particles from stockpiles during high velocity wind – Smoke from burning of waste materials or burning of firewood in the labor camp	– Compliance with prescribed PEQS to control air pollution	– Necessary measures like sprinkling of water on regular basis especially during dry climatic conditions should be taken to limit pollution from dust and other windblown materials. – Covering or use of wind sheets around the stockpiles to avoid air pollution through dispersion – Periodic maintenance and management of all the machinery and vehicles – Cutting and burning trees / shrubs for fuel will be prohibited. Instead gas cylinders should be used in the labor camp for cooking purposes. Similarly waste burning will not be allowed.	Construction Contractor with coordination of Proponent	Proponent/ EPA
2.	**Water Quality** – Run-off water from construction area – Drainage of wastewater on ground can contaminate the soil and groundwater. – Inappropriate disposal of waste. – Open sewerage water disposal on land can contaminate ground water and cause generation of mosquitoes and various other insects in the area. – Leakage of oil and chemical materials from construction	– Control of groundwater or surface water pollution from construction activities	– Use of spill prevention trays and impermeable sheets to avoid contamination of the groundwater – Maximize the use of treated waste water on site (e.g., sprinkling purpose to control dust) – Proper disposal of waste material on dumping sites to avoid leachate generation and contamination of groundwater – Prohibit illegal dumping of waste – The contractor will repair / replace / compensate for any damages caused by the Construction activities to the drinking water source/s. – Regular water quality monitoring according to determined sampling schedule; – The contractor shall ensure that construction debris do not find their way into the drainage system which can block	Construction Contractor with coordination of Proponent	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
	activity		them; – Prohibit washing of machinery and vehicles in surface waters, provide sealed washing basins and collect wastewater in sedimentation/ retention pond.		
3.	**Waste** – Waste from construction activities – Domestic waste from workers	– Proper & safe handling and disposal of construction related waste – Compliance with applicable waste management rules for hazardous and non-hazardous waste disposal – Implementation of waste management plan	– Ensure prevention of inappropriate disposal of waste material – Conduct separate collection of construction and domestic waste to promote recycling and re-use – Ensure maximized use of construction debris on-site to fill excavations etc. – Dispose non-recyclable and hazardous waste material properly according to waste management rules – Proper disposal of waste on agreed site as per agreed method. The area to be leveled and contoured after disposing excess material. No waste or debris will be thrown in the river or other water bodies – Contractor will prepare waste management plan related to construction activities; get its approval from proponent and ensure its full implementation	Construction Contractor with coordination of Proponent	Proponent/ EPA
4.	**Noise** – Noise caused by construction machinery and vehicles used for mobilization of equipment and workers	– Compliance with prescribed PEQS to control Noise pollution	– The contractor will strictly follow the PEQS for ambient noise – Control noise through control of working hours and selection of less noisy equipment. – Prohibit use of pressure horns – Provision of acoustic enclosures (hoods and shrouds) on generator – Proper maintenance of vehicles and construction equipment. – Minimize unnecessary use of pneumatic drills and other	Construction Contractor with coordination of Proponent	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
			noisy machinery – The personal protective equipment (PPE) will be provided to the workers and its usage will be made mandatory		
5.	**Biological Resources** – Removal of vegetation covers by cutting of trees, crops, herbs and shrubs – Fauna including birds and animals will be affected during excavation, movement of labor and carriage of goods and machinery	– Obligation to respect wildlife, Forest and Fisheries Laws. – Conserve biodiversity and its terrestrial as well as aquatic habitat	– Proposed project site does not involve cutting of any trees – Plantation of maximum number of trees. – Staff and workers should be instructed not to damage nearby vegetation of the surrounding area. – Open fires should be prohibited in the area to avoid the hazard of fire and impact on nearby flora and fauna. – Proper disposal of organic waste (if any) generated to avoid rodents and other insects' generation.	Construction Contractor with coordination of proponent	Proponent/ EPA
7.	Staff Conduct	– Timely completion of project activities	– The Contractor must monitor the performance of workers to ensure that point relayed during their induction have been properly understood and being followed	Construction Contractor	Proponent/ EPA
8.	Leakages/ spills/ Paints/ Used oil	– Compliance with standards set forth by "Guidelines for Oil Spill Waste Minimization and Management" issued by International Petroleum Industry Environmental Conservation	– Contractor will apply strict rules on his workers and labor to ensure that no spill or leakages are caused – All fuels, oils and bitumen will be stored appropriately, with concrete padding and bunding for containment in case of leakage – Chemical waste will be disposed of in approved disposal site. – All fuel tanks, chemicals including paints, pesticides or other hazardous substances will be properly marked to highlight their content – PPE will be enforced to use during the handling and application of chemicals – The contractor will employ the general criteria for oil and	Construction Contractor	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
		Associate	leakage at construction sites, as per standards		
9.	Workers Health & Safety	– Prevention of any possibility of work site accident /Impact on worker's health	– Provision of Personal Protective Equipment to the workers – Provision of first aid box at work site to cope with emergency situation – Safety training to the workers – Safe driving training to the drivers – Adequate safety signs on site – Provide training regarding proper handling and use of chemicals/ paints – Install fire extinguishers at fire handling places – Any loss of public/ private property will be compensated by the contractor – Regular checks should be carried out to ensure a contractor is following safe working procedures and practices.	Construction Contractor	Proponent/ EPA
10.	Socio-economic Impacts	– Prevention of conflicts among locals and make the project socially acceptable – Empowerment of locals to possible extent – Increase in employment and business opportunities for locals	– Contractor 's activities and movement of staff to be restricted to designated and within industry – The conduct of the construction staff when dealing with the public or other stakeholders shall be in a manner that is polite and courteous all the time – The site must be kept clean to minimize the visual impact of site – Noisy activities must be restricted to the times given in the Project Specification or General Conditions of contract – The Contractor are responsible for ongoing communication with those people that are interested in / affected by the projects – Employ local residents as much as possible	Construction Contractor with coordination of proponent	Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
11.	Clearance of site from extra / surplus material	– Restoration of site to a similar condition prior to the commencement of the work or to a condition agreed with the project management and landscaping of the site	– Timely removal of waste from the site to avoid congestion at work place. – Care will be taken during handling and disposal of waste. – Contaminated soil (if generated) due to accidental spills will be removed and transported to suitable site for disposal. – Avoid mixing of hazardous waste with non-hazardous waste. – Safe transportation of construction equipment from the site. – Empty/available space will be covered with grassy lawns & ornamental plant species like roses, jasmine, and seasonal flowers	Construction Contractor	Proponent/ EPA
Operational Phase					
1.	**Air Quality Deterioration** – Fuel oil dripping – Vent gases	– Compliance with Ambient air quality (PEQS) standards for control of ambient air pollution	– Proposed facility must be properly ventilated as properly designed and maintained; this can greatly reduce exposure to harmful fumes. – LPG handling is a specialized activity requiring appropriate containers and suitably trained staff. – Ensure periodic proper cleaning & maintenance of LPG storage containers in order to control fumes emissions. – Use tanks specially designed and manufactured to incorporate features appropriate for the fuel they are intended to carry. – Design and operate facility to minimize emissions, release and spread of hazardous substances. – Setting up of a system to monitor air quality along Project Area in accordance with the applicable standards/limits. ***(Moreover, ensure adherence to mitigative measures suggested under section 6.10.5)***	Project Manager	Project Proponent/ EPA

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
2.	**Water Quality** – Wastewater/ Sewerage	– Compliance with Wastewater standards	– No source of chemical contamination in the process water so most of the treated sewage effluents will be used for the irrigation of plants and trees and for watering of landscaped area – The leftover treated effluent of nominal quantity shall be discharged into drain passing nearby through submerged pipes ***(Moreover, ensure adherence to mitigative measures suggested under section 6.10.4)***	Project Manager	Project Proponent/ EPA
3.	**Materials Management**	– Safe, secure and hygienic environment at LPG filling station facility	– Raw material stockpiles shall not be situated such that they obstruct natural pathways. – Provision of all necessary equipment/ accessories for secure collection and management of industrial raw materials.	Project Manager	Project Proponent/ EPA
4.	**Waste** – Municipal Solid Waste	– Compliance with waste management rules – Prevention of inappropriate waste disposal	– Implementation of waste management program consisting of reduce, reuse and re-cycling of materials – Systematic collection and protected storage of waste – Wastes like paper, plastics, wood, fused bulbs, fluorescence electric tubes, rags, plastic and metal cans, glass articles shall be sold in the market for reuse. – Prohibition of dumping of any contaminating material	Project Manager	Project Proponent/ EPA Punjab
5.	**Noise & Vibration** – Noise and vibration from generators & water pump – Noise from vehicles used for mobilization of fuel/ waste	– Compliance with prescribed PEQS to control Noise pollution	– In order to avoid noise in the project area, vehicles shall be operated as avoid use of horns – No activity producing extra ordinary levels of noise will be allowed – Adequate basis & enclosure of generator & water pumps to reduce the vibration & noise – Standby generator shall be curtailed within the limiting values of the Punjab Environmental Quality Standards.	Project Manager	Project Proponent/ EPA Punjab

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
6.	**Fuel Leakage/ Spills**	– Enhanced safety health and welfare at worksite	– Regular inspection of facility for intercepting leaking of LPG – Precautions must be taken to prevent fire and explosion including appropriate protection of fuel storage area – Ensure that any defective equipment or component is repaired or replaced forthwith. – To overcome such potential situations a full proof Emergency Fire Safety Plan must be in practice. – Develop suitable program of maintenance and have appropriate security measures to prevent deliberate interference. ***(Moreover, ensure adherence to mitigative measures suggested under subsection 6.10.7).***	Project Manager	Project Proponent/ EPA Punjab
7.	**Community Development** – Social facilities like road, school, mosque, hospital etc. – Employment opportunities	– Improved social infrastructure and living standards of local residents	**Increased access to social services** – A well-managed community development plan must be managed and exercised by the management of proposed project. – This plan shall include provision of employment preference for the nearby communities. – This plan must be extended to include provision of one school for children, one fare price shop, well paved road, a mosque etc.	Project Proponent	Project Proponent/ EPA
8.	**Environment quality enhancement measures:** – Flowers and plants and trees – Aesthetic beauty of the buildings and the area	– Enhanced land value and scenic beauty of the area	– Plantations in and around the proposed facility must be carried out. – Fountains or other such aesthetic measures must also be taken into consideration in order to increase the beauty of area. – All other necessary measures shall also be taken to maintain standards of cleanliness so that the buildings may add to the	Project Manager in close liaison with project proponent	Project Proponent/ EPA Punjab

Sr #	Project Component & Impact	Targets to Achieve	Mitigation/ Preventive Action	Responsibility	
				Implementation	Monitoring
			scenic/aesthetic beauty of the area around.		
9.	**Health & Safety:** – Work safety – Accident reduction	– To improve the working conditions and environment for the insurance of safe work	– Provision of all the resources to ensure the safety for workers. – Long term changes in the infrastructure and equipment to ensure the health of the workers. – Environmental monitoring/ Indoor air quality monitoring of sources of emissions in the facility. – Frequent training and awareness sessions of workers regarding health and safety procedure with special reference to their code of work. – Formal Environment Occupational Health and Safety Management System Manual must be developed by Proponent and ensure its compliance. ***(Moreover, ensure adherence to mitigative measures suggested under section 6.10.10).***	HSE Officer	Project Proponent/ EPA
9.	**Emergency Response** – Fire risk	– Compliance with OSHA Standard – Prevention of any possibility of fire hazard or other natural calamity	– Operating procedures must be in place to minimize the fire danger at the site inclusive of inspecting incoming raw materials, maintaining storage tanks, and training staff on safety and response procedures. ***(Moreover, ensure adherence to mitigative measures suggested under section 6.10.12).***	Project Manager	Project Proponent/ EPA

Table 7.4: Environmental Monitoring Plan for LPG Storage and Filling Plant by M/S Haroon Energy (Private) Limited

Parameter/Receptor	Location	Monitoring Parameter	Monitoring and Reporting Frequency
Physical Environment			
Water Quality	▪ Ground Water ▪ Surface Water	Discrete grab sampling and laboratory testing of water samples.	▪ Sampling and laboratory testing should be done monthly during construction stage and on annual basis during the operational stage. ▪ Discharges from the facility should be tested for temperature, pH and turbidity.
Air Quality (Dust emissions, vent emissions)	▪ Tracks along road ▪ Indoor air quality ▪ Inside workplace/ Fuel Storage Area	Ambient Particulate Matter, flue gas emissions, fumes Monitoring. Physical Inspection for LPG leakages or releasing.	▪ Ambient Air Monitoring should be conducted monthly during construction stage and on annual basis during the operational stage.
Noise Levels	▪ Selected locations along the access	Noise in dB(A)	▪ Monthly during the construction & annually during operational phase.
Oil Leakages	▪ Fuel Storage Tanks ▪ Tanks Containment Area ▪ Fueling/ Defueling Site ▪ Tanks gauges, equipment's, devices, pipes	Visual/ Physical Inspection Low-psi oil tank pressure testing	▪ Inspection of leaks for fuel storage area, devices etc. should be done daily by project proponent and annually by third party hired for the purpose
Pest Control	▪ LPG Filling facility	Spray of pesticides and fumigation to avoid spread of vectors.	▪ Once in a year when needed during operational phase by project proponent.
Ecological Environment			
Cutting of trees Tree plantation	In all Project Area during the execution of proposed project.	Landscaping.	▪ Monthly during construction phase monitoring and annually during the operational phase.
Socio-cultural Environment			
Inconvenience to community/ Public Health	All around the Project Area	Consultations with community to get feedback about inconvenience due to the operational activities to perform their daily routine chores.	▪ Annual monitoring and reporting during the operational period.

CHAPTER-8

RECOMMENDATIONS & CONCLUSIONS

8.1 RECOMMENDATIONS

The Environmental Impact Assessment (EIA) Report and survey results are finally evaluated to recommend the following:

- The present Environmental Impact Assessment (EIA) Report of Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited meets the administrative and legal framework of the EPA Punjab.
- Care shall be given on the health and safety of workers during construction & operational phases of the project.
- The Proponent should assign trained staff for execution of proposed project activities.
- The Proponent should plant vigorously indigenous plants and trees in and around the project site.
- Consider Fire safety precautions to prevent or reduce the likelihood of a fire to break out.
- There should be adherence to safe working procedures to ensure health safety of workers.
- Mosquito repellent sprays/ fumigation should be carried out to keep facility disinfected and pest free and spread of disease vectors in control.

8.2 CONCLUSION

The EIA Report of Construction of LPG Storage and Filling Plant by Haroon Energy (Private) Limited located at Khewat No.16, 50/3 Khatooni No. 47 to 52, 127, Khasra No. 713/1, 715/1, 714/2, Mouza Ahmad Pur, Tehsil & District Hafizabad. – Pakistan is made to fulfill the legal requirement of Punjab Environmental Protection Act, 1997 [Amendment, 2012]. In order to address the potentially adverse impacts of the project, an EMP has been developed, which will further improve the environmental performance of the project. The EMP assigns roles and responsibilities, provide environmental guidelines and discuss the scope of Environmental Management Plan.

The EIA Report has thoroughly assessed all the potential environmental impacts associated with the project. The environmental impacts identified by the study are manageable. Project specific and practically suitable mitigation measures are recommended to mitigate the impacts. This EIA concludes that proposed project will not pose any major adverse environmental impacts on environment if the anticipated impacts are properly mitigated and the Environmental management Plan is properly implemented. It is environment friendly project as it fosters the economic, social and aesthetic values of country without any environment degradation. The project solves various environmental and social problems

already raised by the poor health care system in the Pakistan.

Therefore, the project under consideration does not require any further environmental study; hence the EIA Report has been completed for the said project so the project Construction of LPG Storage and Filling Plant by M/S Haroon Energy (Private) Limited, is recommended for the Environmental Approval and issuance of NOC from the EPA, Punjab.

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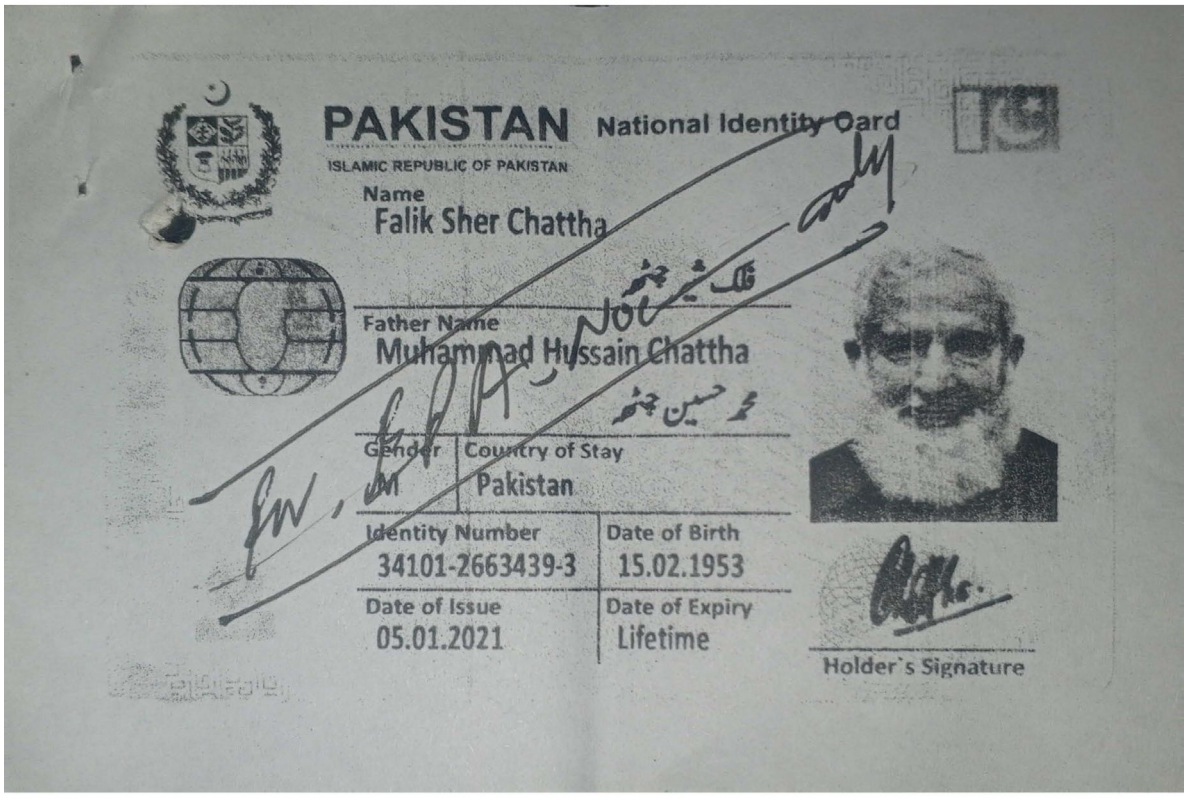
ANNEXURE-I

PROPONENT CNIC: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Father Name
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Gender
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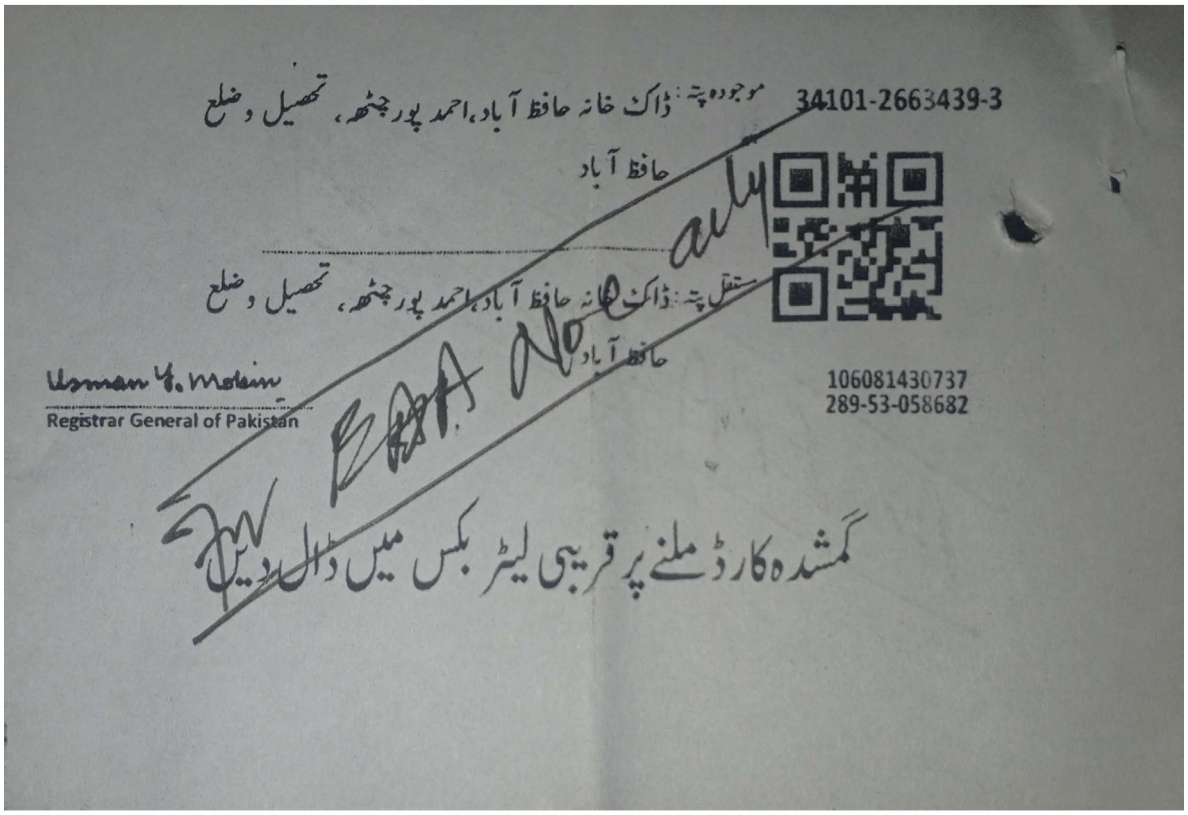
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34101-2663439-3
حافظ آباد
مستقل پتہ: ڈاک خانہ حافظ آباد، احمد پور چٹھہ، تحصیل و ضلع
حافظ آباد
Usman Y. Mobin
Registrar General of Pakistan
106081430737
289-53-058682
گمشدہ کارڈ ملنے پر قریبی لیٹر بکس میں ڈال دیں

ANNEXURE-II

Contract Agreement between OGRA and Proponent

ANNEXURE-III

Layout Plan

ANNEXURE-IV

Site Location Map

ANNEXURE-V

List of Team Members Performing EIA Study

Sr. #	Name	Qualification
TEAM LEAD		
i.	Sami Ullah	M.Phil. Environmental Sciences
ii.	Mr. Basharat	M.Phil. Environmental Sciences
ENVIRONMENTAL SCIENTIST & OTHER STAFF		
i.	Mr. Hanan Yousaf	M.Phil. Environmental Sciences
ii.	Anam	Masters (Business Administration)
iii.	Maiydah	MPhil (Business Administration Research)
iv.	Sana Ejaz	MBA (Insurance and Risk Management)
v.	Sabeen	BBA
vi.	Saad	Civil Engineering
vii.	Awais Saleem	Environmental Engineering
viii.	Abdul Haseeb Akhtar	Field Officer

ANNEXURE-VI

Approvals from Other Govt. Departments

ANNEXURE-VII

LAB REPORT